HANDBOOK OF THE BIRDS OF THE WORLD

Edited by
Josep del Hoyo
Andrew Elliott
David Christie

Volume 10

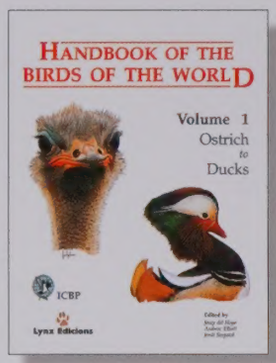
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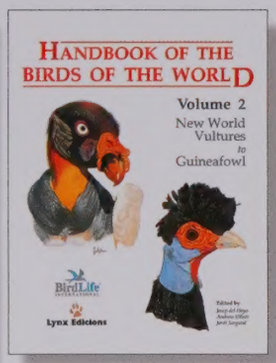


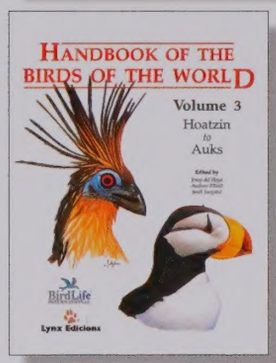


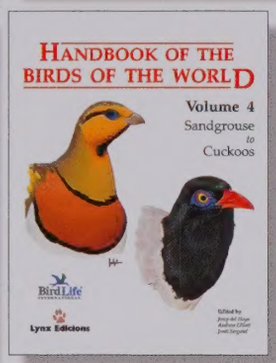
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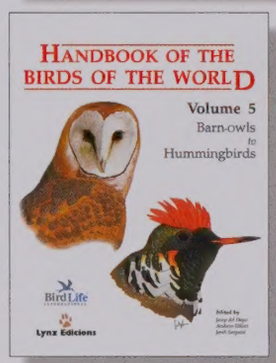
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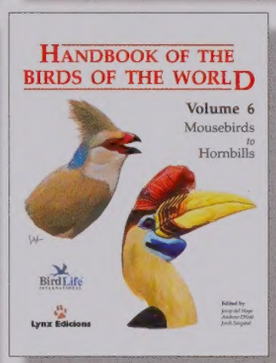


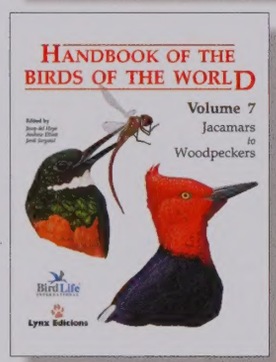


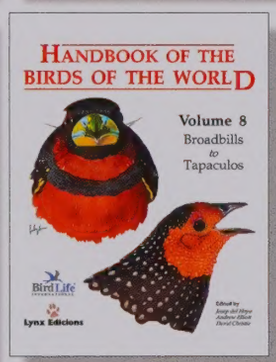


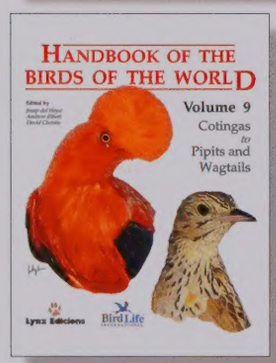


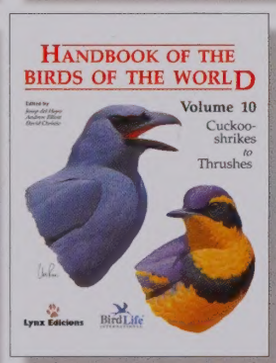




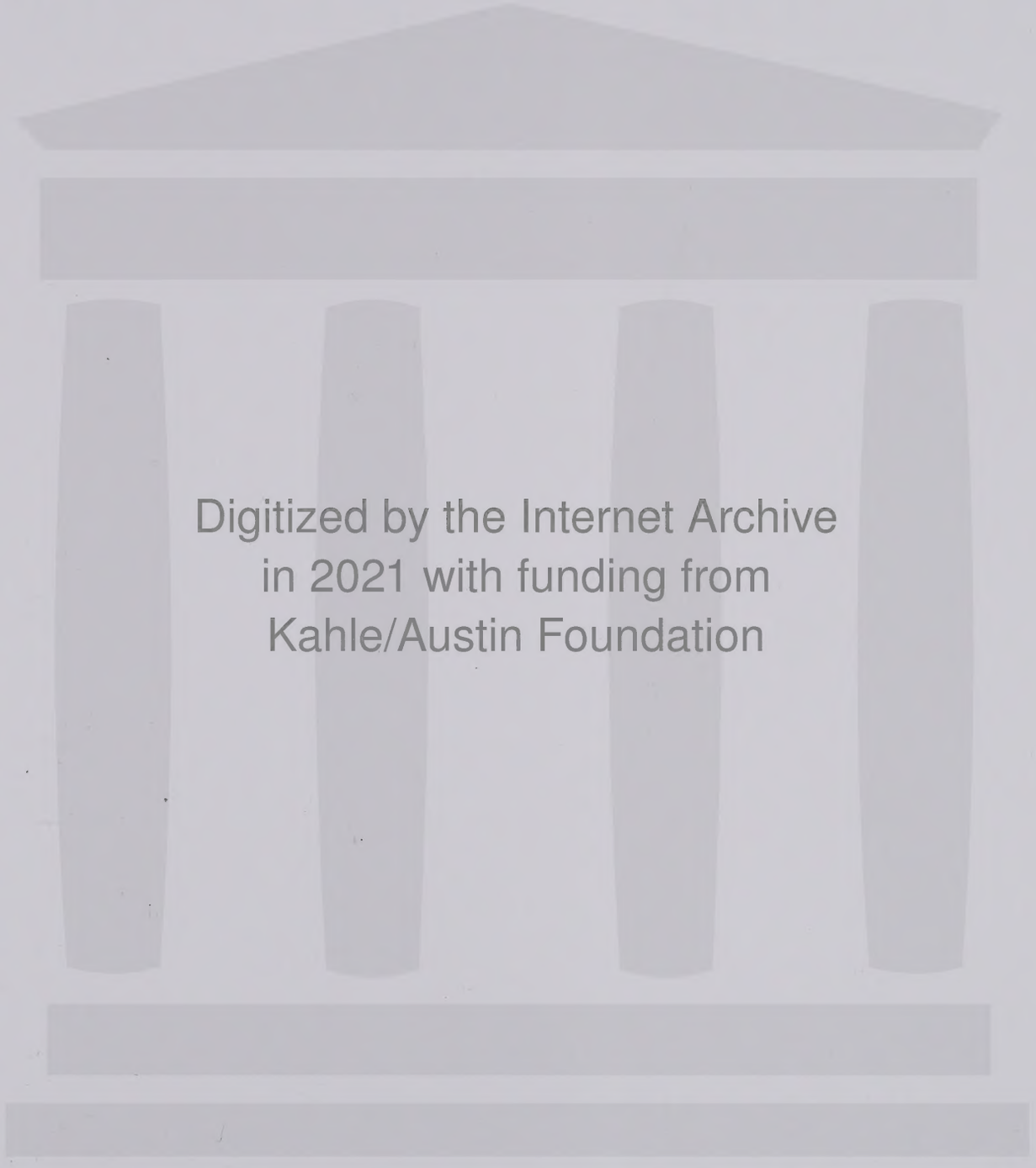








Jacket illustration by CHRIS ROSE
Stout-billed Cuckoo-shrike (*Coracina caeruleogrisea*)
Varied Thrush (*Ixoreus naevius*)


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Josep del Hoyo
Andrew Elliott
David Christie

Simon Aspinall
Tim Blackburn
David Brewer
Phillip Cassey
Miyoko Chu
Jordi Clavell
Martin Cody
Nigel Collar
Richard Duncan
Lincoln Fishpool
Ben Hatchwell
Donald Kroodsma
Jim Mountjoy
Steve Ormerod
Richard Porter
Daniel Sol
Barry Taylor
Helen Temple
Joseph Tobias
Stephanie Tyler
David Wells

Colour Plates by

Norman Arlott
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John Cox
François Desbordes
Ren Hathway
Ian Lewington
Douglas Pratt
Chris Rose
Brian Small
Jan Wilczur
Ian Willis
Tim Worfolk

Consultant for Systematics and Nomenclature

Walter J. Bock

Consultant for Status and Conservation

Nigel J. Collar

Lynx Edicions

Barcelona

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Authors of Volume 10

S. J. Aspinall
Freelance Ecological Consultant and writer, Abu Dhabi, United Arab Emirates.

Dr T. M. Blackburn
Reader in Macroecology, School of Biosciences, University of Birmingham, Birmingham, England.

Dr D. Brewer
Research Associate, Department of Ornithology, Royal Ontario Museum, Toronto, Canada.

Dr P. Cassey
Postdoctoral Researcher, School of Biosciences, University of Birmingham, Birmingham, England.

Dr M. C. Chu
Science Editor, Cornell Laboratory of Ornithology, Cornell University, Ithaca, New York, USA.

J. Clavell
Co-ordinator of the Exotic Birds Study Group (GAE), SEO/BirdLife, Barcelona, Spain.

Professor M. L. Cody
Emeritus and Research Professor, Department of Ecology and Evolutionary Biology, University of California, Los Angeles, California, USA.

Dr N. J. Collar
Leventis Fellow in Conservation Biology, Conservation Biology Group, Department of Zoology, University of Cambridge, Cambridge, England.

Professor R. P. Duncan
Associate Professor, Bio-Protection and Ecology Division, Lincoln University, Lincoln, Canterbury, New Zealand.

Dr L. D. C. Fishpool
BirdLife International, Cambridge, England.

Dr B. J. Hatchwell
Reader, Department of Animal & Plant Sciences, University of Sheffield, Sheffield, England.

Professor D. E. Kroodsma
Professor Emeritus, Department of Biology, University of Massachusetts, Amherst, Massachusetts, USA.

Dr D. J. Mountjoy
Assistant Professor, Department of Biology, Knox College, Galesburg, Illinois, USA.

Professor S. J. Ormerod
Professor of Ecology, School of Biosciences, Cardiff University, Cardiff, Wales.

R. F. Porter
Adviser to BirdLife International's Middle East Conservation Programme.

Dr D. Sol
Associate Researcher, Centre de Recerca Ecològica i Aplicacions Forestals (CREAF), Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain.

Dr P. B. Taylor
Honorary Research Associate, School of Botany & Zoology, University of KwaZulu-Natal, Pietermaritzburg, KwaZulu-Natal, South Africa.

H. J. Temple
Postgraduate, Department of Zoology, University of Cambridge, Cambridge, England.

Dr J. A. Tobias
BirdLife International, Cambridge, England.

Dr S. J. Tyler
Monmouthshire, Wales.

Dr D. R. Wells
Research Affiliate, University Museum of Zoology, Cambridge, England; formerly University of Malaya, Kuala Lumpur, Malaysia.

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Foreword

The Ecology and Impact of Non-indigenous Birds

1. Introduction

In March 1890, around 60–80 Common Starlings (*Sturnus vulgaris*) were released into Central Park, New York, as a plan to establish in North America all avian species cited in the works of Shakespeare (Wood 1924). Early attempts to introduce the species in 1872/73 had failed, but this one proved to be successful. Supplemented by subsequent introductions, the starlings spread to other states, reaching Pennsylvania in 1908, Alabama in 1918, and Kentucky in 1919. This range expansion continued during the following decades, and today the Common Starling is one of the most abundant and widespread birds in North America.

The introduction of plants and animals facilitated by human activities has been so common and widespread a phenomenon that alien species are currently recognized as a central element of global environmental change (Sakai *et al.* 2001). For birds alone, there have been more than 1900 documented attempts to introduce about 400 species all over the world (Cassey 2002a). A European visiting New Zealand, Australia or the Hawaiian Islands will likely feel at home listening to the familiar vocalizations of a variety of introduced European songbirds. Gerald Durrell (1966) noted on his trip to New Zealand: "We might as well have stayed at home if all we were going to see was blackbirds and skylarks".

This unprecedented exchange of species between regions is not only leading to a rapid homogenization of the earth's biota (Lockwood *et al.* 2000), but also poses a major threat to biodiversity and ecosystem functioning (Williamson 1996, Parker *et al.* 1999, Simberloff 2001, Fritts and Rodda 1998). Nowadays, non-indigenous species represent the second-most-frequent threat of species extinction after habitat loss, and they have become the primary threat to oceanic island biotas. Recent estimates indicate that one-quarter of all bird species at risk of extinction are threatened because of the effects of non-indigenous species (Stattersfield &Capper 2000). Non-indigenous species may affect native species through competition, predation or disease transmission; altering their genetics through hybridization and introgression; and can even change the structure and functioning of the entire ecosystem. In addition to ecological problems, invasive species are responsible for serious human health problems and important economic losses, which in the USA alone can exceed $100 billion per year (Vitousek *et al.* 1996, Everett 2000).

Given the considerable evidence currently available on the problems associated with past introductions, one would think that we would have learnt our lesson. Yet, surprisingly, potentially damaging introductions continue in many regions of the planet. In fact, many countries do not seem to perceive invasive species as an important problem. In a recent survey by the United Nations, fewer than 10% of the countries polled declared that most non-indigenous species in their territory had been identified, and only 2% acknowledged the problem enough to invest sufficient economic resources to deal with it.

What can we do to minimize the crisis generated by non-indigenous species? Given that once a species is established it is costly and often impossible to eradicate or control, prevention of new introductions is fundamental in order to minimize the impact of invaders (Mack *et al.* 2000). This demands that we understand the factors that allow certain species to establish and spread into foreign environments, so that we can identify situations where invasion risk is high (Duncan *et al.* 2003). Ecologists have long wondered what determines the success of species that are introduced into foreign environments (Mayr 1965, Ehrlich 1989). How is it that a species that has not evolved in a community not only is capable of invading it, but may even displace species adapted to live there through generations of selection?

Although researchers have for some time been pessimistic about the possibility of ever answering this question, recent studies have begun to uncover some of the rules that govern the invasion process (Williamson 1996, Kolar & Lodge 2001, Duncan *et al.* 2003). Much of this progress has come from the study of birds (Duncan *et al.* 2003, Cassey, Blackburn, Sol *et al.* 2004), for which detailed information is available on a large number of successful and failed introduction attempts (e.g. Long 1981, Lever 1987). Past avian introductions are undoubtedly an unfortunate natural experiment, but at the same time they have provided critical information for a better understanding of invasions and how we may prevent them. This has allowed the factors associated with their success and failure to be explored. Here, we describe the progress that has been made on this issue thanks to the study of avian introductions. We then examine the ecological and economic impact caused by avian invaders, and explore ways in which we might help mitigate the problem in the future.

2. A framework for understanding invasions

The process by which species establish exotic populations can be usefully illustrated as a sequence of stages (Figure 1; cf. Williamson 1996, Richardson *et al.* 2000, Daehler 2001, Kolar & Lodge 2001). First, the species must be transported from its native range to a new location. Second, it must be released or escape into that environment. Third, it must succeed in establishing a self-sustaining wild population, following release. Fourth, species that establish successfully may increase in abundance and spread beyond the release point, the extent of which defines their geographical range in the new environment. We term these stages transport, introduction, establishment and spread (see also Lockwood 1999, Kolar & Lodge 2001, Sakai *et al.* 2001), and for a species to have reached a given stage in the invasion process, it must have passed through all the previous stages (see Cassey, Blackburn, Jones & Lockwood 2004, Cassey, Blackburn, Russell *et al.* 2004, for analysis of transitions through these stages).

It is useful at this point to clarify some of the terms we will use. An introduced species is one that passes through the first two stages and is released (or escapes) into a new environment. An established (also termed naturalized) species is one that forms a self-sustaining wild population following introduction. An established species that succeeds in spreading beyond the site of introduction is termed an invasive, while the introduction of a species to a location is termed an introduction event. We use the term 'introduction' to refer to a species that has been transported to, and been released or escaped into, an alien environment, regardless of whether or not it establishes or spreads.

The stages shown in Figure 1 provide a useful framework for reviewing what we know about the factors affecting the outcome of bird introductions around the world, and we consider each of these stages in turn.

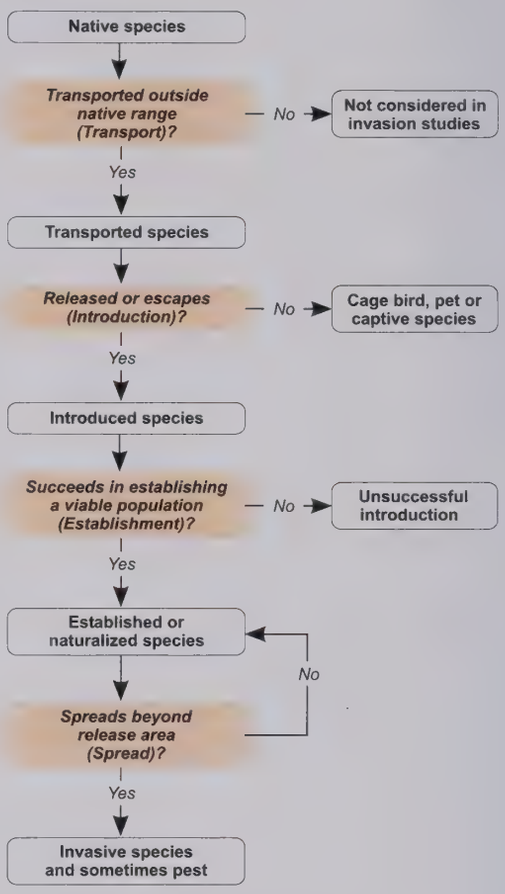


Figure 1. Schematic representation of the transitions in the process of a human-caused invasion that we recognize in this review. The stages through which a species must pass are shown in bold. From Duncan et al. *(2003).*

3. Transport and introduction

a. History of avian introductions

Since humans began purposefully leaving their homelands to colonize new territories, they have taken or brought back with them exotic plants and animals. Evidence for bird introductions dates back at least 3000 years in India, for introductions of the Greylag Goose (*Anser anser*), Rock Dove (*Columba livia*), and Red Junglefowl (*Gallus gallus*) (Cassey 2002a, Brooke & Birkhead 1991), and for introductions of junglefowl by Polynesian seafarers to locations as remote as Easter Island (Hurles *et al.* 2003).

Nevertheless, most bird introductions occurred during the great migrations of European settlers in the 18th and 19th centuries. The people moving to new colonies, notably in the Americas, Australia, New Zealand and South Africa, encountered new environments very different to the highly modified European landscapes they left behind. Introducing species that reminded them of their European homeland was one motivation for bird introductions, along with purposeful introductions for hunting and pest control; accidental escapes of cage birds were another cause. The process of transporting and introducing species was facilitated by the setting up of acclimatization societies in many countries during the 19th century. In New Zealand, for example, acclimatization societies were set up with a stated aim being "the introduction, acclimatisation and domestication of all animals, birds, fishes, and plants, whether useful or ornamental" (McDowall 1994). Private individuals also took it upon themselves to "improve" the biota of new territories through introductions (e.g. Guild 1938 on Tahiti) and in some cases even formed amateur naturalist groups (Long 1981). In

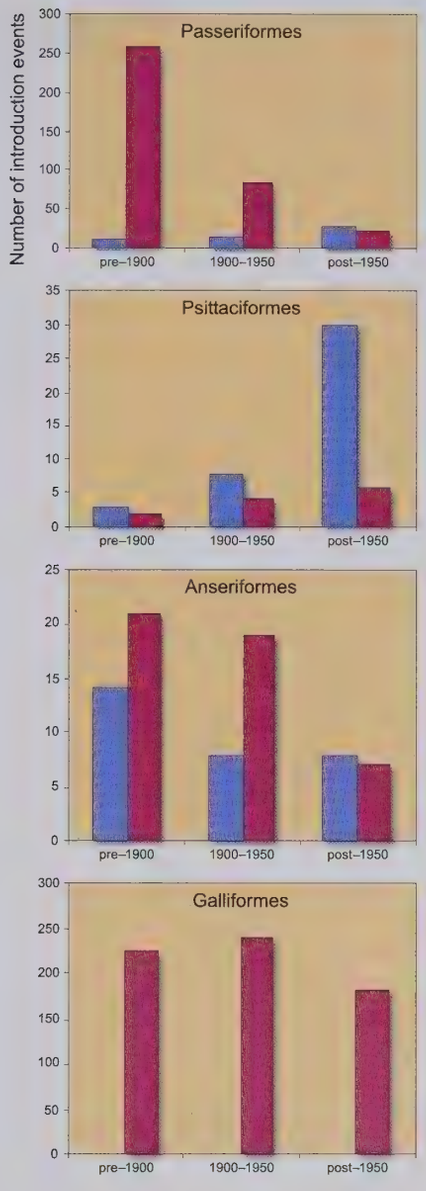


Figure 2. Trends in the frequency of accidental (blue bars) and deliberate (purple bars) introductions from early times to the present day, for four of the most widely introduced orders of birds.

South Africa, Cecil Rhodes introduced several species in order to diversify the bird fauna of Cape Town, described previously as "poverty-stricken" (Cassey 2002a).

Quite quickly, however, it was realized that bird introductions frequently had undesirable side-effects. By 1899 sparrows introduced to North America had been described as "one of the worst of feathered pests" (Palmer 1899), while in New Zealand Drummond (1906) commented that the "company [of the introduced birds] was found not to be half as desirable as had been anticipated". Indeed, in New Zealand the Protection of Certain Animals Act of 1861, which provided protection from hunting during most of the year for "swan, partridge, English plover, rook, starling, thrush and blackbird", was soon replaced by the Small Birds Nuisance Act of 1882, and eventually by The Injurious Birds Act of 1908, with provision for the wholesale destruction of certain introduced species (Thompson 1922). Growing awareness of the negative impacts of introduced birds has led to a decline in the frequency of purposeful introductions, particularly among Passeriformes, where early introductions (before 1900) were almost all intentional (Figure 2). Intentional introductions of Galliformes have continued, primarily for game purposes, while accidental introductions of Psittaciformes have increased, almost certainly in response to an increase in the importation and trade of cage birds.

b. Which species were selected for introduction?

Humans have transported and introduced to a new location fewer than 5% of the world's bird species (Blackburn & Duncan 2001a). The species chosen for transport and introduction are by no means a random subset of the world's birds. Instead they tend to be concentrated in certain taxonomic groups and geographical regions, and to possess particular characteristics. We examine the patterns and causes of selectivity for each of these features in turn.

Taxonomic selectivity

Three studies have examined the patterns of taxonomic selectivity associated with bird introductions worldwide. Blackburn & Duncan (2001a) considered selectivity in the birds chosen for introduction, while Lockwood (1999) and Lockwood *et al.* (2000) considered selectivity in the birds that had become established following introduction. The results are similar in that the families over-represented at the introduction stage are also the families over-represented among established species. Consequently, we can infer that a major cause of taxonomic selectivity among established species is taxonomic selectivity in the species chosen for introduction.

Of the species chosen for introduction, around two-thirds belong to just six bird families: Anatidae; Phasianidae; Columbidae; Psittacidae; Passeridae; and Fringillidae (Blackburn & Duncan 2001a). The over-representation of species in these families undoubtedly reflect two of the major motivations behind bird introductions: species in the families Anatidae and Phasianidae were primarily introduced for hunting; while species in the families Psittacidae, Passeridae and Fringillidae are frequently kept as cage birds and would have been transported and introduced by people for aesthetic reasons (see Long 1981, Lever 1987). Nevertheless, even introductions in these families involve only a small subset of species, and most (69–94%) of the species in these families have never been introduced by people outside their native range (Blackburn & Duncan 2001a).

Geographical selectivity

The number of bird species increases towards the equator. However, a disproportionate number of the bird species chosen for introduction come from temperate regions, with their native ranges centred between 30° and 50° in both hemispheres (Blackburn & Duncan 2001a). While the Neotropics are a centre of bird diversity, being home to around 30% of all bird species (Rahbek 1997), only about 8% of introductions involve species from this region. Conversly, about 16% of introductions involve species from the Palearctic, despite only about 10% of bird species having geographical ranges that include this region (Sibley & Monroe 1990). Overall, species from tropical regions are greatly under-represented in lists of introduced species.

This pattern of geographical selectivity can largely be attributed to introductions carried out by European settlers, who mostly colonized other temperate parts of the world. Thus, opportunities for the transport and trade of birds during the 18th and 19th centuries would have been greatest between western Europe and the predominantly temperate locations where Europeans settled and with which they traded, including North America, South Africa, Australia and New Zealand. Around 60% of the bird species introduced to New Zealand originate from the Palearctic and Australasian

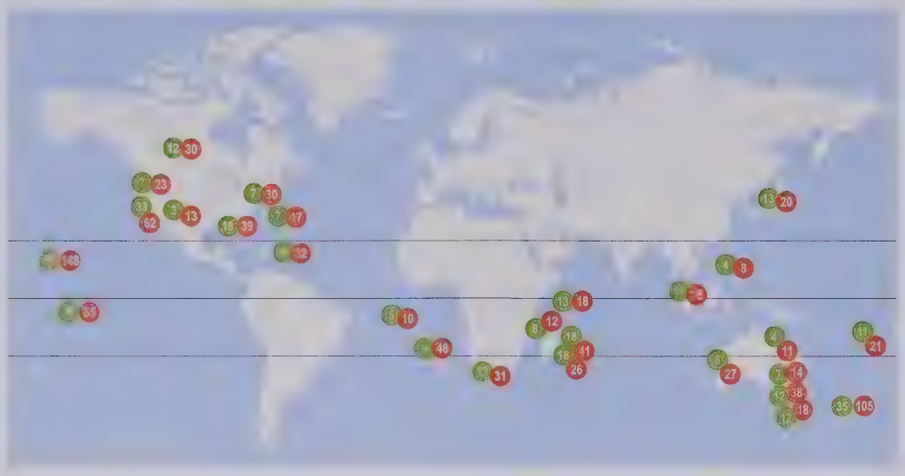


Figure 3. Regions of the world with highest numbers of established and introduced bird species.

Country, island or state of introduction	Established	Total introduced
Hawaiian Islands	58	148
New Zealand	35	105
California	33	62
Tahiti	11	55
St Helena	9	48
Mauritius	18	41
Florida	18	39
Victoria	12	38
Puerto Rico	23	32
South Africa	13	31
Canada	12	30
New York area	7	30
Western Australia	8	27
Reunion	18	26
Oregon	7	23
Fiji	11	21
Japan	13	20
Tasmania and nearby islands	12	18
Seychelles and nearby islands	13	18
Bermuda	7	17
Singapore	11	15
New South Wales	7	14
Texas	3	13
Comoro Islands	8	12
Queensland	4	11
Ascension Island	5	10
Philippines	4	8

regions (Duncan *et al.* 2005), the two areas with which trade and transport were most frequent during early European settlement of New Zealand.

Character selectivity

Birds in different taxa and from different regions of the world often possess characteristic life-history or ecological traits (e.g. Gaston & Blackburn 2000, Cardillo 2002). Given that the birds chosen for introduction are not a random subset of the world's birds, we might expect them to possess traits characteristic of the taxa or regions that are over-represented. Thus, we would expect introduced birds to possess predominantly the characteristics of temperate gamebirds (Anatidae and Phasianidae) or cage birds (Psittacidae, Fringillidae and Passeridae). There have been few tests of character selectivity for introduced birds, although for those introduced to Australia a high proportion of species are ground-nesters that utilize grassland, cultivation or suburban habitats, and have largely vegetarian diets, such as seeds, fruit and the like (Newsome & Noble 1986). Introduced species are also larger-bodied, on average, than would be expected if they were a randomly chosen subset of bird species (Blackburn & Gaston 1994, Cassey 2001a).

Selection for certain characteristics also occurs independently of taxonomic and geographical selectivity. Within both a geographical subset (e.g. species in the British avifauna) and a taxonomic subset (e.g. order Anseriformes: wildfowl) of the world's birds, the species chosen for introduction are those with larger population sizes (Blackburn & Duncan 2001a). For wildfowl, people tended also to select larger-bodied species, while for British birds they tended to select widely distributed and resident species. Species with a large population size, wide distribution and that are resident throughout the year are the commonest species, and hence the most readily available for capture and transport to new locations. They are also likely to be familiar species, and people may have targeted them specially for introduction.

Taken together, these findings describe a general hierarchy of causes that have contributed to the selective introduction of certain birds. First, the species chosen for introduction were concentrated in geographical regions that in large part reflect the origin of European settlers and their subsequent patterns of settlement and trade. Second, from within geographical regions, people chose certain kinds of bird for introduction for a variety of reasons. An emphasis on birds for hunting and aesthetic purposes has resulted in birds from five families being significantly over-represented among those chosen. Finally, given that birds were chosen for particular purposes and from certain regions, the species that were finally caught, transported and introduced tended to be those that were common in the source locations. People preferentially selected abundant, widely distributed species, either because they were most readily available for capture, or because they were species with which they were most familiar, and therefore most desired to introduce.

c. To which locations were birds introduced?

While birds have been introduced to all major regions of the world (Fig. 3), relatively few introductions have been to equatorial regions. Most have been to latitudes between 10° and 40° on both sides of the equator (Blackburn & Duncan 2001a). An additional, and very striking pattern, is that people mostly introduced birds to islands

(Cassey 2003). Around 70% of introductions have been to islands (Blackburn & Duncan 2001a) even though islands only make up about 3% of ice-free land area (Mielke 1989). Over half of all introductions were to islands in the Pacific (especially the Hawaiian Islands) and Australasia.

It is interesting to speculate why islands have been such a major focus for bird introductions. The answer may lie in the characteristically low numbers of bird species found on islands, relative to continents, and the extent to which island birds have suffered extinctions since human arrival. Only 52 bird species are recorded as being introduced to mainland Australia (Duncan *et al.* 2001), with its large and diverse native avifauna, compared with the introduction of over 120 species to nearby New Zealand (Duncan *et al.* 2004), with its smaller and less diverse avifauna that suffered a major extinction event following European arrival. With fewer species, European colonists may have perceived island avifaunas as being particularly impoverished and in need of "improvement".

4. What determines establishment success?

Once a species has been successfully transported and introduced, and thus passed through the first two steps on the introduction pathway, it finds itself at liberty in a novel environment. The next challenge it must overcome is to establish a self-sustaining population. The historical record shows that the chances of this are roughly 50:50 (Cassey 2002b). The obvious question then is what is it that distinguishes those cases that result in successful establishment from those that end in failure? Producing an answer to this question is complicated by the range of factors that could potentially influence establishment success.

For example, success may be more likely for species with high reproductive rates, which can rapidly build up populations to levels beyond which extinction is unlikely. Such species are typically small-bodied and short-lived. Alternatively, large body size and longevity may buffer a species against environmental fluctuations that could rapidly extirpate populations of less robust exotics. Clearly, the environment itself may also play an important role, with more stable and benign climates being perhaps more accommodating to introductions. Such climates may also have more stable and abundant food resources for the introduced species to exploit. However, in many cases they are also likely to house more potential competitors for those resources, and more predators ready to exploit the introduced forms themselves. Success in the face of these interactions could depend on how adaptable and flexible individuals of the exotic species are, and hence on their intelligence or capacity to innovate. Any of these factors could also be affected by the circumstances of each separate introduction. If only a few individuals were released (or mainly males), in poor condition (perhaps after a long sea journey from their homeland), or at a disadvantageous time of year, then any advantages bestowed by features of a species' biology or the location of introduction may count for little. On the other hand, carefully planned and supported introductions might succeed regardless. Thus, the idiosyncrasies of individual introduction events could mask the influence of other factors in determining establishment success.

This last point highlights a significant problem in any attempt to untangle the factors influencing the establishment of exotic species. As if the number of such factors were not enough, there is good reason to believe that many effects will be confounded, making the influence of individual characteristics harder to elucidate. For example, species that are commoner in Britain tended to be introduced in greater numbers to New Zealand (Blackburn & Duncan 2001a). Species that are common in Britain also possess traits that distinguish them from less common species—they tend to be passerines, small-bodied, and preferentially use certain types of niche (Nee *et al.* 1991, Gregory & Gaston 2000). It follows that for species introduced from Britain, characteristics of the introduced species will be confounded by the number of individuals introduced. If success is related to one of these factors, it is likely to be related to both. Separating the influence of confounded factors requires careful statistical analysis (using multivariate techniques).

Unfortunately, the issue of confounded factors is not the only significant problem that impedes the analysis of establishment success. The reader will recall that some species such as the House Sparrow (*Passer domesticus*) have been introduced to many exotic locations, while some locations such as Hawaii have received many exotic introductions. If some species are better at establishing than others, or if it is easier to establish at some locations than others, then the outcome of introductions of the same species, or of introductions to the same location, will be correlated. This means that each introduction event is unlikely to represent an independent piece of evidence for the influence of a factor on establishment success, because we would expect similar outcomes (either success or failure) for all species introduced to the same location, or

for all introductions of the same species regardless of location. This violates a core assumption of standard statistical tests, which assume that every data point analysed provides an independent piece of information for the test. When data points are not independent, statistical tests are more likely to show that factors are a significant influence on establishment success when actually they are not.

Let us consider, for example, bird introductions to Hawaii and New Zealand. A total of 142 bird species were introduced to the Hawaiian Islands (Moulton *et al.* 2001), where 56% of introduction events succeeded in establishing viable populations; in turn, 120 species were introduced to New Zealand and associated islands (Duncan *et al.* 2005), where only 35% of introduction events succeeded. It would be easy to conclude that tropical islands are easier to invade than temperate islands, and that we have over 200 independent data points (introduction events) to support this view. In fact, this is akin to concluding that women are taller than men by only comparing adult Swedish women and adult Pygmy men. We only really have two independent data points (the archipelagos), which is certainly not enough from which to draw any firm conclusions. The best we can do is conclude that it has been easier for birds to establish in the Hawaiian Islands than in New Zealand, which may be because of their different latitudes, but could result from any of the many other differences between them. Indeed, even that conclusion could be erroneous: instead, the species introduced to Hawaii might simply be better invaders than those introduced to New Zealand, or introduced in larger numbers, and so on. If we wanted to draw conclusions about establishment success in tropical versus temperate regions, we would have to bolster our data with introductions to other regions. Even then, if the majority of tropical introductions were to the Hawaiian Islands, these data might tell us more about Hawaii specifically than the tropics generally. In practice, therefore, we would also need to employ statistical techniques that can allow for confounding variables and incorporate information on non-independence, and so produce unbiased estimates of the effects of different factors; examples include generalized least squares, linear mixed models, generalized linear mixed models, and generalized estimating equations (Diggle *et al.* 1994, Goldstein 1995). Such techniques are only now being applied to the analysis of establishment success in birds (e.g. Blackburn & Duncan 2001b, Cassey, Blackburn, Sol *et al.* 2004).

Problems such as those just described with historical data have led some to conclude that establishment success is likely to be inherently unpredictable (Ehrlich 1989, Gilpin 1990, Williamson 1996). Indeed, early studies showed a notable lack of success in identifying any consistent patterns in establishment (Williamson 1996). Nevertheless, major goals of invasion ecology are to identify factors that have some potential for explaining the outcome of introduction events, and to identify which are most important and why (Williamson 1999). Despite their inherent problems, historical data on birds represent probably the best opportunity for understanding establishment processes for real introductions. That said, the problems described above mean that the results of many earlier studies must be treated with caution (Duncan *et al.* 2003). This needs to be kept in mind through what follows.

In order to make it easier to navigate through the tangle of factors that might potentially affect establishment success, we classify each factor into one of three categories: characteristics of the species introduced, such as their population growth rate or body size; features of the introduction location, such as its climate; and factors associated with, and often unique to, each introduction event, such as the number of individuals released. These are termed species-, location- and event-level factors respectively (Blackburn & Duncan 2001a; cf. Williamson 1999, 2001). The characteristics of each species and location ought to remain reasonably constant for all introductions concerning them. On the other hand, event-level characteristics seem very likely to vary idiosyncratically from one event to the next. Since the outcome of introduction events also seems to be idiosyncratic, this has led some authorities to conclude that event-level factors may be the key determinants of success (e.g. Williamson 1996, Duncan *et al.* 2003). Hence, it is with these that we begin our review of the causes of establishment success. In what follows, we review the findings of the wide range of studies that have explored the factors in each category thought most likely to be determining establishment success. We finish by synthesizing these findings to highlight what we think these studies really tell us.

a. The idiosyncrasies of individual introductions: event-level effects

Introduction effort

Most exotic species are released in low numbers and so start with small founding populations. Indeed, 49% of bird introductions for which the appropriate information

exists involved the release of fewer than 50 individuals (Cassey, Blackburn, Sol *et al.* 2004). IUCN categorize bird species with fewer than 50 individuals left in the wild as Critically Endangered, or Critical. In quantitative terms, this means that they have more than a 50% chance of becoming extinct in the next 10 years (or three generations), even if their populations are not currently in decline (Stattersfield & Capper 2000). These are species living in their native environment, to which they have presumably had plenty of time to become well adapted. Their small populations are highly prone to extinction for a variety of reasons, including the effects of environmental fluctuations (e.g. successive harsh winters or long periods of drought), natural disasters (e.g. hurricanes or volcanic eruptions), demographic stochasticity (random variations in the sex ratio of offspring can leave a population with few females), genetic stochasticity (reduced genetic variation can lower a population's adaptability, or increase the chances of inbreeding depression) and problems in finding mates at low densities. The probability of extinction for an equivalent-sized population of an exotic species that must additionally face the challenges of a new environment is presumably higher still. It is not surprising therefore that many introductions fail.

A straightforward explanation for the success of some introductions is that they involved the release of a greater number of individuals and so were more likely to escape the threats facing small founding populations. That is, establishment success increases with greater introduction effort (Cassey, Blackburn, Sol *et al.* 2004), or "propagule pressure" (Williamson 1996). Because information on release sizes has been recorded in many cases, it is possible to use historical bird introductions to test this hypothesis. All studies that have addressed this question so far have shown that species introduced with greater effort (typically measured as the total number of individuals released) have a higher probability of establishment (e.g. Dawson 1984 cited in Williamson 1996; Newsome & Noble 1986, Pimm 1991, Duncan 1997, Green 1997, Cassey, Blackburn, Sol *et al.* 2004). The same is true for re-introductions (Griffith *et al.* 1989, Wolf *et al.* 1998). Most studies show that greater introduction effort increases establishment success without specifically addressing the mechanism by which this increase is brought about, although Legendre *et al.* (1999) present evidence from birds introduced to New Zealand that it is at least in part due to a reduction in the effect of demographic stochasticity.

Introduction effort may influence establishment success not only through the number of individuals released, but also through the number of release attempts. A greater number of separate releases may improve the chances that at least some individuals encounter favourable conditions for population growth, while if different releases are from different locations, the probability that favourable habitat is encountered will also be increased (Crawley 1986). Veltman *et al.* (1996) reported that species successfully introduced to New Zealand were released at more localities than unsuccessful species, which supports the latter idea, although the number of localities and the total number of individuals released were correlated in their data. Griffith *et al.* (1989) found that re-introductions involving releases over a greater number of years had a greater probability of establishing, independent of the number of individuals released. This supports the suggestion that multiple releases are more likely to encounter favourable conditions for growth, because, unlike introductions, re-introductions are likely to be made into suitable habitat.

There are notable exceptions to the general pattern that greater effort leads to greater establishment success. Despite the introduction of over half a million Common Quail (*Coturnix coturnix*) to more than 30 states in North America between 1875 and 1958 (Bump 1970), no introduction succeeded (Lever 1987). Clearly, factors other than effort can determine the fate of introductions.

Environmental matching

We have mentioned that the survival probability of a small population of an exotic species is likely to be reduced by the additional challenges posed by a novel environment. It follows that the survival probability ought to be higher if a species is not so challenged because the climate and physical environment at the location of introduction matches that to which it is already adapted (Brown 1989, Williamson 1996). We classify environmental matching as an event-level factor here because it is a feature of neither the species nor the environment alone, but is defined by the interaction between the two. Two environmental matches will only be the same if they relate to two introductions of a given species to a given location, but as such multiple releases are defined as a single event, the environmental match is thus a feature unique to each introduction event.

A range of results supports the idea that a closer environmental match improves the chance that an exotic bird species will successfully establish. Regions at similar latitudes or within the same biogeographical region are more likely to be similar in

climatic and habitat conditions, and avian introductions are more likely to succeed when the difference between a species' latitude of origin and its latitude of introduction is small, and when species are introduced to locations within their native biogeographical region (Blackburn & Duncan 2001b, Cassey 2003). Success is also more likely when climatic conditions in the species' native range are similar to those of the introduction location (Duncan *et al.* 2001). Also supporting the importance of environmental matching is the finding that species re-introduced into the core of their original range had greater establishment success than species released in the periphery (Wolf *et al.* 1998). It is often argued that conditions at the core of a species' distribution will be more suitable for it than those at the edge (Brown 1984), although this is actually far from universally true (Gaston 2003).

Consistent with the importance of environmental matching is the finding that establishment success is often positively related to geographical range size across species (Moulton & Pimm 1986, Blackburn & Duncan 2001a, Duncan *et al.* 2001). Large geographical ranges typically span a wide range of environmental conditions, suggesting that the species that attain them may have broad environmental tolerances. Alternatively, wide-ranging species may utilize environments that are themselves widespread (Gaston 1994). Either way, wide-ranging species may be more likely to encounter suitable conditions following release at an exotic location, increasing their probability of establishment (for a related argument, see Ehrlich 1989).

The idea that a close match between the native and exotic environment may improve an introduced species' chances of establishing makes no assumptions about the quality of the environment itself. Yet, it seems intuitive that different environments ought to differ in terms of the ease with which exotic species can make themselves at home. Just as a life on a tropical island may seem more desirable to many people than one on a temperate island, might it not also seem so to introduced birds? Certainly, Hawaii is well stocked with them—over 70 species on recent estimates. Thus, we now go on to examine the evidence that some regions are more amenable than others to the establishment of exotic birds.

b. Why some regions house more exotics than others: location-level effects

Natural features

There are many features of the environment that might determine whether or not a location is hospitable for an exotic species, but these can be broadly divided into three groups (Shea & Chesson 2002, Duncan *et al.* 2003).

First, and what is probably most attractive to us about the Hawaiian Islands, the climate there might be relatively benign. Typically, we think of benign climates as those without extremes of temperature, humidity or rainfall. However, as we explored in the previous section, the definition of "extreme" will depend on the conditions to which each species is best adapted, and so there is unlikely to be any universal standard. Nevertheless, we do know that most bird species are located at warm tropical latitudes where water is plentiful, and that the number of species tends to decrease as annual minimum temperatures or water availability decrease (e.g. Whittaker *et al.* 2003). This suggests that, on average, climates at lower latitudes ought to be more benign for most species. Islands may also be more benign, as the maritime influence on their climate tends to moderate temperature extremes and ensures rain, at least to windward.

Second, establishment should be favoured at locations where there are more available resources. The specific requirements of species mean that, once again, there is unlikely to be any universal standard for resource availability. Moreover, it is a major task to quantify these requirements for even one species. Nevertheless, similar logic to that in the previous paragraph leads us to suspect that resource availability should, in general, be higher at lower latitudes, where the greater diversity and abundance of plant and animal life suggests more opportunities for exotics. However, that same diversity also implies greater competition for those resources. Whether resource abundance or number of competitors is likely to be the dominant force in determining exotic establishment is unclear, but we can at least say that since both vary with latitude, so too should establishment success. A clearer prediction is that the lower species richness of birds on islands compared to proximal mainlands should lead to lower competition, and hence easier exotic establishment on islands.

It has also been suggested that since larger areas of habitat provide more resources in total, larger areas potentially could support more individuals of an exotic release. Since, as discussed in a previous section, larger populations are less likely to go extinct, establishment may be more likely in larger areas. Alternatively, however, establishment may be reduced in larger areas as these will tend to house more native

competitors (both in total and in each local community: Rosenzweig 1995, Srivastava 1999, Gaston & Blackburn 2000). Moreover, if larger areas result in more dispersed founding populations, that may lower the probability of successful establishment regardless of the effect of competitors, because of the greater difficulty in finding mates.

Third, establishment should be favoured at locations where exotics are challenged by fewer enemies, be they predators, parasites or diseases. Once again, it is difficult to identify precisely which enemies will be, or even are, more important in preventing the establishment of any given species, so studies tend to assume that more species generally will result in more enemies specifically. Thus, enemies should make it harder for exotics to establish at lower latitudes and in larger areas, where species richness is higher, but easier on islands in comparison to mainlands (Elton 1958).

Tests of the underlying processes (e.g. the influence of interspecific competition) determining location-level variation in establishment success are difficult for historical bird data, as the direct causes for failure are inaccessible to investigation. Studies of the influence of location thus regularly focus on testing the predictions outlined above about the influence of latitude, insularity, area and species richness. Unfortunately, the three sets of location-level variables produce contrasting predictions with respect to relationships expected. All three predict that islands should be easier to invade than mainland regions. The influences of climate and resource availability suggest that it should be easier to establish at lower latitudes or where species richness is higher, while resource availability predicts better establishment in larger areas. However, the effects of competitors and enemies predict the reverse in each case.

In support of the island prediction, bird species introduced to mainland Australia had a higher failure rate than bird species introduced to Australia's offshore islands (Newsome & Noble 1986). However, this result could be an artefact of differences in the establishment ability of the different sets of species introduced to mainland and islands. Additional support for the influence of insularity is hard to find. A study by Sol (2000) that took account of species identity in two independent island-mainland comparisons (New Zealand vs. Australia, and Hawaiian Islands vs. USA mainland) yielded no evidence that islands were easier to invade. This result was subsequently generalized in two global analyses of bird introductions, neither of which could find a relationship between establishment success and whether the introduction was to a mainland or island location (Blackburn & Duncan 2001a, Cassey 2003). The high proportions of exotic bird species found on islands appear to be a consequence of the many attempts to introduce birds to islands (see Section 3c), rather than any inherent feature of islands that make them easier to invade.

Latitude and habitat area are no better at predicting establishment success. Blackburn and Duncan (2001b) failed to find any relationship for birds between success and latitude of introduction in their global study. Case (1996) found a weak positive correlation between island area and the number of bird species introduced, but no evidence that area also influenced establishment. Smallwood (1994) similarly found no evidence that smaller Californian nature reserves were any harder for birds to invade than larger reserves.

Bird introductions also provide little evidence for the hypothesis (Elton 1958) that species richness influences establishment success. Case (1996) showed that the number of established bird species does not vary significantly with the richness of the native avifauna, nor indeed with the variety of potential mammalian predators. There is no difference in the establishment probability of birds introduced to Australia versus New Zealand, even though the former has more natives. These studies suggest that resident species richness is not important in determining the outcome of bird introductions. In fact, competition between native and exotic birds is probably unlikely to regulate exotic establishment because most aliens establish in highly modified habitats, such as farmland and urban areas, which are little used by native species (Diamond & Veitch 1981, Simberloff 1992, Smallwood 1994, Case 1996). In New Zealand, for example, it is rare, on the one hand, to see native bird species on farmland, other than recent colonists that appear to have moved in from Australia specifically as a consequence of the availability of such habitat, or, on the other hand, exotic bird species in native woodland, although Common Chaffinches (*Fringilla coelebs*), Common Blackbirds (*Turdus merula*) and Song Thrushes (*Turdus philomelos*) do appear to be moving in. While it is possible that these non-significant results for location are because opposing influences of climate/resource availability and competitors/enemies on establishment success cancel out, we suspect that they reflect the truth.

Fighting amongst themselves? Competition between exotics

Although competition between native and exotic birds is likely to be very limited because they tend to be segregated by different habitat requirements, that still leaves

open the possibility that establishment success could be mediated by competition amongst the exotics, at those locations which have received multiple releases. This argument has been propounded in a suite of studies of different island exotic bird faunas by Michael Moulton and colleagues (Moulton & Pimm 1983, Moulton 1985, 1993, Moulton & Sanderson 1996, Moulton *et al.* 2001, Brooke *et al.* 1995). Moulton *et al.* present two types of evidence in support of this idea.

First, the success of passerine introductions to both Hawaii and St Helena declines with time as the number of exotic species accumulates. Moulton *et al.* argue that this is because each successive release faces competition from an ever-larger number of established species. Second, successfully established species at several locations overlap less in their morphological characteristics than would be expected if established species were a random selection of all species released; this is termed "morphological overdispersion". Moulton *et al.* argue that this pattern arises because species are more likely to fail due to competition with other introduced species of similar morphology. Each of these conclusions has, however, been questioned.

For example, Duncan (1997) noted that although later introductions of passerine birds to New Zealand faced a greater number of already established species and were less likely to succeed, this relationship was confounded by introduction effort. Later introductions tended to be of fewer individuals and so were less likely to succeed for that reason. Similarly, Duncan and Blackburn (2002) showed that significant morphological overdispersion found by Moulton *et al.* (2001) among gamebirds established in New Zealand could not have resulted from competition. The distribution of releases over the islands in both space and time meant that it was highly unlikely that individuals from any two gamebird introductions would ever have met to compete. Instead, overdispersion could be explained by the fact that gamebird species were released in lower numbers if a similar species was already established in New Zealand. Duncan *et al.* (2003) pointed out that it is not only birds that are introduced to exotic locations. Later bird releases in New Zealand would also have faced a greater diversity and abundance of introduced mammalian predators. The effects of competition and predation in preventing historical establishment would be difficult to distinguish. These results for New Zealand do not rule out the importance of interspecific competition among exotics in other introduced bird assemblages, but they do bring into question the evidence presented in support of this mechanism.

In summary, the evidence garnered to date from historical bird introductions suggests no consistent effect of the release location on exotic success or failure. This might be considered somewhat surprising in the light of our earlier conclusion that environmental matching does seem to matter. Clearly, the compatibility between an introduced species and the environment into which it is released is more important than features of the environment *per se*. Does this mean that the same is true for characteristics of the species? Next, we consider the evidence that certain traits enhance the establishment success of the species that possess them.

c. Why some birds are better invaders than others: species-level effects

Travel around the world and you will encounter a range of exotic bird species. After all, more than 200 have successfully established somewhere (Cassey 2002a). However, there are certain exotics that you will encounter again and again. Examples include the Common Myna (*Acridotheres tristis*), Common Starling, House Sparrow and Rock Dove (Long 1981). Indeed, it is difficult to think of some of these species as anything other than aliens. A colleague of ours told us about walking through a park in London on a first visit to England, inwardly bemoaning the presence of so many exotic birds. Having studied exotics around the world, it was with a sense of embarrassment that the realization dawned that the House Sparrows, Common Starlings, Common Chaffinches and Common Blackbirds were actually native! The widespread success of certain introduced birds suggests that some species may simply be good at establishing in novel environments. Whether species differ inherently in their probability of establishing, and, if so, what characteristics regulate this difference, are two questions that have long interested ecologists (Elton 1958, Mayr 1965, Ehrlich 1989).

Do species differ in their probability of establishing?

Simberloff and Boecklen (1991) noted what they termed an "all-or-none" (AON) pattern for bird introductions to the Hawaiian Islands. Each species tended to establish successfully or to fail repeatedly on all islands to which it was introduced. Mixed outcomes, where a species established on only some islands, were rare (although see Moulton 1993, Moulton & Sanderson 1996, 1999, Duncan 1997, 1999). The AON

pattern suggests that some species are particularly good at establishing, and so succeed everywhere they are introduced, while other species are poor and so fail everywhere. That would imply in turn that characteristics of the species are key determinants of establishment success.

The observation of an AON pattern for introductions to Hawaii of itself provides little evidence for the existence of good and bad establishers. It may instead say more about the match between the Hawaiian environment and the requirements of the various species released. Conversely, the existence of good and bad establishers is not refuted by the objection (Moulton 1993, Moulton & Sanderson 1996, 1999, Duncan 1997, 1999) that most species do not follow a strict AON pattern, as the lists of successes and failures catalogued by Long (1981) and Lever (1987) both show. Release of a particularly poor invader at an especially amenable site, or vice versa, will muddy the statistics. The question is whether species do genuinely differ in establishment success, all else being equal. Blackburn and Duncan (2001b) addressed this question by fitting statistical models for establishment success in global bird introductions that controlled for the confounding effects of event-level and location-level variables. They found that each species tends to have a similar establishment outcome every time it is introduced, but that there are highly significant differences among species. In other words, some species genuinely seem to be better than others when it comes to exotic establishment. This leaves us with the question of why?

Why do species differ in their probability of establishing?

Bird species differ in a huge variety of characteristics, from size to colour, from physiology to behaviour. It seems reasonable to assume that amongst all these traits is one, or more, that varies in tandem with a species' probability of establishing. If that is indeed the case, such traits may act in one of three ways: they may pre-adapt a species to the new environment; they may favour population increase from the low numbers that were released; or they may constrain establishment success (Blackburn & Duncan 2001b).

Observed relationships between establishment success and environmental matching suggest that it is particularly important that an introduced species finds the exotic location to suit its ecological requirements. The likelihood of this should be higher if the exotic has catholic tastes. Thus, we would expect generalist species with broad environmental tolerances to be better at establishing than specialists (Ehrlich 1989). Several studies have found evidence that birds with broader diets were more likely to establish viable populations following release (Mclain *et al.* 1999, Cassey 2001b). Similarly, Brooks (2001) found that introduced birds categorized as habitat specialists were less likely to establish successfully. However, generalism is not found to enhance success in every case (Veltman *et al.* 1996, Sol *et al.* 2002). One problem here may be that most measures of it are relatively crude. For example, dietary generalism is often assessed by dividing food into a few broad types (such as vegetation, fruit, invertebrates, etc.), and summing the number of types a species uses. It is often the case that fewer dietary records exist for rare or more geographically restricted species, which can make such species seem artificially specialized (Gaston 1994). Since more abundant species are usually released in larger numbers (Section 3b), generalism may thus be confounded with effort, whose importance in establishment success we have already seen.

The likelihood that an exotic species can establish successfully may also be higher if the species has the flexibility to change its behaviour in response to novel challenges posed by the new environment (Mayr 1965, Sol & Lefebvre 2000, Sol *et al.* 2002). Exploiting new food resources, surviving new climates or avoiding new enemies may all require the modification of a species' existing repertoire, or even the invention of completely new forms of behaviour (Lefebvre *et al.* 2004). The hypothesis that behavioural flexibility enhances establishment (Mayr 1965) is supported by studies by Sol and colleagues (Sol & Lefebvre 2000, Sol *et al.* 2002), which show that established birds tend to have larger brains for their body size, and show more forms of innovative behaviour in their region of origin, than do failed species.

Most introduced species must secure a foothold in their new environment from a bridgehead of relatively few individuals. It is in these early stages that exotic birds are particularly vulnerable to the stochastic extinction processes that afflict small populations, and which so trouble conservation biologists (Section 4a). Thus, it has been suggested that species may be more likely to establish if, through rapid population growth, they can more quickly escape the risks posed by small population size (Moulton & Pimm 1986, Pimm 1991). Population growth rates are difficult to measure directly, so most tests of this idea utilize traits that are known to be related to them. Small body mass, short development time, multiple broods per season and large clutch size should all be indicative of a bird species with fast population growth.

However, it is also easy to think of reasons why species with these characteristics should also be less likely to establish. Small-bodied species with high rates of population growth also tend to have more variable population sizes. This could increase their risk of extinction following release because their population densities may be more likely to be pushed down to terminally low levels (Pimm 1991). If population variability is more influential than population growth rate, larger-bodied, longer-lived bird species, that have populations with slower rates of growth but that are more resistant to environmental fluctuations, would be expected to have a higher probability of establishment (Legendre *et al.* 1999, Forsyth & Duncan 2001).

Tests of these contradictory predictions for the influence of life-history characteristics of avian establishment success reflect them in their contradictory findings. For example, Cassey (2001b) found that birds with longer generation times were more likely to establish following introduction to New Zealand, whereas Griffith *et al.* (1989) reported higher establishment success for re-introduced species classified as "early breeders" than for those considered "late breeders". Cassey (2001b) also showed that establishment in New Zealand was more likely for species with larger clutches, thus finding support for the influence of both "fast" and "slow" life-history traits on success (see also Green 1997). However, other studies find the reverse relationship for clutch size (Duncan *et al.* 2001), or no relationship at all (Veltman *et al.* 1996).

Results for body size are no less equivocal (e.g. Veltman *et al.* 1996, Green 1997, Sol & Lefebvre 2000, Blackburn & Duncan 2001b, Duncan *et al.* 2001), and opposing trends can even be found within a single study. Cassey (2001a) showed that small body size equated to higher establishment success across bird species. Yet, when he compared species within the same taxonomic family, he found that larger-bodied species were more likely to establish. A pattern like this could arise if, for example, a primary role in establishment for high population growth rate (giving the negative relationship across species) was modified amongst close relatives by resistance to environmental fluctuations. Species related by family tend to have similarly high or low population growth rates (Owens & Bennett 1995), and so variation in success amongst them may depend on their relative ability to weather hard times, giving the positive relationship within families.

Some traits may just be bad news for any species attempting to establish a foothold at an exotic location. One commonly cited example is migration (Kolar & Lodge 2001). If it is hard enough to respond to the challenges of one new environment, migrants have to deal with two; that is, if they can even locate a wintering ground, or indeed if there is a wintering ground for them to locate. The physiological costs of preparing for a migratory flight cannot help either. Certainly, migratory species released in New Zealand have been less likely to establish than non-migratory species (Veltman *et al.* 1996, Duncan *et al.* 2003). However, even migration does not appear to be an unequivocal handicap, as Duncan *et al.* (2001) found no evidence that it hindered the establishment of bird species introduced to Australia.

d. Synthesis and future directions

Readers arriving at this point may by now be thoroughly confused by the variety of event-, location- and species-level characteristics that do or do not influence establishment success, or that in some cases seem to do both. They might recall the comment near the start of this section that some people have considered establishment success to be inherently unpredictable, and have some sympathy with this view. However, we are not so pessimistic. Recent studies that apply modern multivariate statistical techniques simultaneously to assess the influence of multiple hypotheses, while accounting for the confounding effects of non-independence among events have, to our minds, greatly clarified the likely causes of establishment success.

An important advance towards this clarification has been provided by analyses that quantify where in the taxonomic hierarchy variation in establishment success is located (Blackburn & Duncan 2001b, Cassey 2002b, Sol *et al.* 2002). What these studies show is that species tend to have similar establishment outcomes for all their introduction events. In other words, if you want to predict the likely success of a bird release, a good place to start is by checking on its past history of success. However, these studies also show that higher taxonomic levels have much less explanatory power to predict establishment success. In other words, the past introduction history of one species of sparrow tells you very little about the likely success or failure of another sparrow species. This has two significant implications for our understanding of establishment success.

First of all, the fact that related species do not exhibit similar levels of introduction success means that success will not be well predicted by any characteristic that species do share (Blackburn & Duncan 2001b). This includes most of the life-history

traits related to population growth rates, such as body size, clutch size and longevity. It also suggests that location-level characteristics are also unlikely to be good candidates for predicting success unless it is true that certain species tend to be introduced to certain environments. However, in that special case, variation in success would probably be due to variation in environmental matching, which is an event-level characteristic. Thus, the pattern of variation in establishment amongst species tells us why neither species-level nor location-level effects have been found to be good or consistent predictors of success.

The second implication is that what does influence establishment success must be a characteristic (or suite thereof) that does vary among closely related species. This suggests two broad classes of candidate (Blackburn & Duncan 2001b). The first class includes those species-level variables in which relatives do often differ markedly. Obvious candidates include abundance, geographical range size, or whatever factors (currently unknown) in turn underlie their variation. The second class of candidates is event-level effects, and in particular introduction effort. These effects are well known to be idiosyncratic, but that idiosyncrasy could be patterned such that different introduction events involving the same species share event-level characteristics. If so, then that would explain both the distribution of success across species, and the cause of that success (Duncan *et al.* 2003).

Cassey, Blackburn, Sol *et al.* (2004) have gathered information on effort for more than 800 bird introductions worldwide. They found that variation in effort was distributed across the taxonomic hierarchy in the same way as establishment success. In other words, species tend to be released in broadly similar numbers in all their introduction events, but those numbers differ on average between even related species. Blackburn and Duncan (2001b) showed why this could happen. Species that are more abundant or widespread in their native ranges have tended to be released in larger numbers, presumably because common species are more likely to be caught in large numbers. Moreover, Cassey, Blackburn, Sol *et al.* (2004) showed that many of the characteristics previously suggested to explain establishment success (including annual fecundity, body mass, migratory tendency, geographical range size, dietary generalism, and whether or not the release is on an island) are also correlated with effort. Recall the similar effects described above, for example the confounding of overdispersion and effort for Galliformes introduced to New Zealand (Moulton *et al.* 2001, Duncan & Blackburn 2002). When all the aforementioned characteristics were analysed together using multivariate statistics, only effort and habitat generalism were found to explain independent variation in establishment success (Cassey, Blackburn, Sol *et al.* 2004).

Thus, introduction effort currently seems our best candidate to explain variation in establishment success (Duncan *et al.* 2003, Cassey, Blackburn, Sol *et al.* 2004). Effort differs among species because species differ in their abundance and range size, and hence in their availability for capture, transport and release. However, effort is not the whole story. Cassey, Blackburn, Sol *et al.* (2004) also showed that average success and average introduction effort are not correlated across regions, and neither are they correlated across taxa. In other words, although increases in effort elevate success, they do not do so in a consistent manner across species. For example, similar average numbers of individuals released lead to the success of 70% of the introduction events in Sturnidae but only 30% in Muscicapidae, and 56% of the introduction events in Hawaii but only 35% in New Zealand (Cassey, Blackburn, Sol *et al.* 2004). This idiosyncratic taxonomic and regional variation in success reflects similar findings in other studies (Blackburn & Duncan 2001b, Duncan *et al.* 2001, Moulton *et al.* 2001): for example, that introduced gamebirds (Galliformes) were significantly less likely to establish in Australia than species of other orders. These as yet unexplained patterns of taxonomic and regional variation in establishment success are likely to be important topics for subsequent investigation.

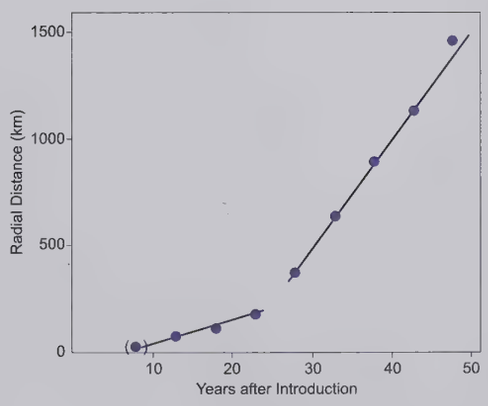


Figure 4. Plot of radial distance of the Common Starling's North American range versus time since introduction. Radial distance measures the effective radius of the range (specifically, √range area divided by √π). Rate of spread was initially relatively slow at 11·2 km/year, but then jumped to a higher but constant rate of 51·2 km/year. Plots of range expansion with this biphasic pattern are termed 'type II'. From Shigesada & Kawasaki (1997).

5. Spread following establishment

When the Common Starling was introduced in New York's Central Park, it took around a decade for the species to establish itself. Another decade passed before the species began slowly to spread, but then around a decade after that the rate of spread increased (Figure 4) so that within 80 years of release starlings had advanced right across the continent to the Pacific coast (Shigesada & Kawasaki 1997). At about the same time as the Common Starling was first introduced, a related species, the Crested Myna (*Acridotheres cristatellus*), was released and became established on the opposite side of the continent, in Vancouver. The myna initially became reasonably numerous but never spread, remaining confined to the environs of its initial release area. Spread is now unlikely, as the species has declined to low numbers (Duncan *et al.* 2003).

Birds probably have the greatest powers of dispersal of any organism. Individuals can cross continents in a matter of hours. Migrants of some species, such as the Arctic Tern (*Sterna paradisaea*) or the Sooty Shearwater (*Puffinus griseus*) undertake annual migrations that cover thousands of kilometres. Individuals of even relatively sedentary species can disperse over tens or hundreds of kilometres. Given that, and that a species has established a self-sustaining population at a location, why is it that only some species spread out from that bridgehead to invade the exotic location? Or more generally, why do species differ in the extent of their final distribution at any given location? How is that spread achieved? And why do species differ in how fast they spread? We address the last two questions first.

a. How do species spread? Pattern and rate

To understand how spread is achieved, it is necessary first to know the pattern of spread that needs to be explained. Data that allow us to plot the pattern of range expansion over time, such as those for the Common Starling, are relatively rare for birds. However, plots equivalent to Figure 4 also exist for the House Finch (*Carpodacus mexicanus*) in eastern North America (Shigesada & Kawasaki 1997); the Egyptian Goose (*Alopochen aegyptiaca*) in the Netherlands (Lensink 1998); the Common Waxbill (*Estrilda astrild*) in Portugal (Silva *et al.* 2002); and for the natural range increase of the Eurasian Collared Dove (*Streptopelia decaocto*) in Europe (Hengeveld 1989). In each case, spread shows the biphasic pattern illustrated in Figure 4, with an initial period of relatively slow increase followed by a higher but constant rate of spread. For the waxbill, the curve has a third phase as the growth rate slows, probably because all sites available for the species have been occupied. Spread in the initial growth phase has been calculated as 1·16 km/yr for the Egyptian Goose; 3·5 km/yr for the House Finch; and 11·2 km/yr for the Common Starling. These values increase to 4·59, 20·7 and 51·2 km/yr, respectively, in the faster second phase of spread. These biphasic growth curves are termed 'type II' (Shigesada & Kawasaki 1997), to distinguish them from type I curves, which show a single constant rate of range increase, and type III curves, where an initial linear rate of slow growth is followed by a period of growth at a faster but continually increasing rate. So, what do these type II curves tell us about how bird ranges expand? An answer can be obtained by examining the properties for different mathematical models of range expansion.

One simple way of thinking about an expanding range is as a growing population that is expanding the area it occupies by diffusion of individuals across the landscape. This is the approach taken in a classic paper by Skellam (1951). Skellam was able to show that if the invading population is growing exponentially, if the landscape is uniform, and if the diffusion of individuals across the landscape follows a random walk (i.e. they move randomly in a way that is similar mathematically to the well-known Brownian motion of smoke particles in air), then the invasion front advances at a constant velocity. In other words, the rate of range expansion is such that the points in a plot of radial distance versus time (e.g. Figure 4) fall on a straight line. Although the model assumes exponential growth, and hence that the population size grows without check to infinite size, the same prediction is obtained if the more realistic logistic pattern of population growth is assumed, where populations reach some finite carrying capacity. This is because diffusing populations grow by expansion at the range edge, where they will not have reached carrying capacity, and so probably are growing in an exponential manner. Skellam's model is a useful start, as some invading populations do follow this type I pattern of range expansion (Shigesada & Kawasaki 1997). Unfortunately, bird invaders are not among them.

Skellam's model assumes that ranges grow only by the random diffusion of individuals across the environment. One alternative is to assume "stratified diffusion", where spread occurs both by random diffusion of individuals from the core population, but also by occasional long-distance dispersal events. This process can be simulated by what is termed a "coalescing colony" model: the name speaks for itself. Under this model, the range initially expands through random diffusion at the wave front, as in Skellam's model, and so grows at a constant but slow rate. However, the population occasionally produces long-distance dispersers that go on to found new colonies, which then also start to expand. When these new colonies meet the expanding front of the core range, they are absorbed into it. When this first happens it results in an increase in the rate at which the core range expands, and this is maintained as subsequent colonies are encountered and absorbed (Shigesada & Kawasaki 1997). When the rate at which long-distance dispersers are produced is proportional to the radius (or circumference) of the core range (rather than its area), the change in radial distance over time follows the type II curve.

The coalescing colony model has two attractive features. First, it generates the biphasic pattern of range expansion over time characteristic of birds (e.g. Figure 4). Second, it models a pattern of dispersal that bird invaders appear to follow. For example, Hengeveld (1988) showed that the distribution of dispersal distances of individual Eurasian Collared Doves included both long-distance and short-distance events as the species spread across Europe. Several of the exotic bird species introduced to the main islands of New Zealand have colonized outlying islands, which in many cases involve dispersal over several hundred kilometres of ocean. Of course, these colonies will not coalesce with the core populations, but they are indicative of long-distance dispersal events. More generally, ringing returns from native British birds show that most individuals of most species disperse relatively short distances (under 5 km), both as juveniles and adults, but a few individuals travel long distances (over 100 km; Paradis *et al.* 1998). The spread of the House Finch following its introduction to the eastern USA has involved both neighbourhood diffusion and jump dispersal events, the latter resulting in small satellite populations that eventually coalesced with the core part of the range (Shigesada & Kawasaki 1997). These satellites seem to develop preferentially in good-quality habitat (Gammon & Mauer 2002).

Exploring the features of different models for spreading populations allows us to identify processes that can, and also those that cannot, explain the patterns of range expansion we see for invasive birds. Nevertheless, while these models allow us to examine factors affecting the rate of expansion in a few typically widespread exotic species, no study has yet quantified or examined the reasons underlying interspecific variation in rate of spread.

b. Determinants of final distribution

Although no study has considered the reasons behind interspecific variation in the rate of spread, three studies have examined why different introduced species end up with different final range sizes at the exotic location (Duncan, Blackburn & Veltman 1999, Duncan, Bomford *et al.* 2001,Williamson 2001). These studies concern the exotic bird assemblages of Australia and New Zealand. We highlight three factors that these studies find to be consistently related to exotic range size.

First, exotic species have larger ranges if the exotic location has larger areas of suitable habitat or environmental conditions. In New Zealand, the species with the largest geographical ranges were those whose preferred habitat was most widespread, specifically species that use extensive human-modified habitats such as farmland. On the larger and more climatically varied continent of Australia, exotic species with larger geographical ranges were those with a greater area of more climatically suitable habitat available. This variable explained more than two-thirds of the variation in final range size amongst these species.

Second, exotic species have larger ranges in the exotic location if they have larger native geographical range sizes. This pattern could arise because species with larger native ranges may have broader environmental tolerances or use more widespread resources. This might not only enhance establishment, as we discussed in Section 4c, but also allow a greater extent of spread across the exotic environment.

An alternative possibility is that the range-size effect could arise from the general trend for more widespread species to be introduced in larger numbers (see Section 4d). Species with large founding populations might get a head-start in establishment that allows them to appropriate a greater proportion of the resources available for exotic invaders in the new environment. In practice, this initial advantage could have compounded itself—those species initially able to capture a greater share of resources would have had faster population growth and rate of spread, allowing them further to pre-empt resources at newly colonized sites as their ranges expanded. Two pieces of evidence are consistent with this view for exotic bird species in New Zealand. First, species introduced with greater effort were more likely to spread and achieve a larger geographical range size (Duncan *et al.* 1999). Second, the relationship between range size and effort was most pronounced among closely related species. Related species are more likely to compete for similar resources, and so it is amongst these species that we would expect any head-start given by variation in introduction effort to be most important (Duncan *et al.* 1999). This explanation implies that competition may play a role in limiting the range sizes of established species, even though it does not appear to influence establishment success (see Section 4b). Nevertheless, it requires further testing to establish whether the relationship between introduction effort and exotic range size holds beyond the single example of New Zealand. It does not hold for Australia (Duncan *et al.* 2001).

Third, the geographical range size of exotic species in New Zealand and Australia relate consistently to several life-history traits (Duncan, Blackburn & Veltman 1999,

Cassey 2001b, Duncan, Bomford *et al.* 2001, but see Williamson 2001). More widespread species tend to be those with life-history traits associated with high population growth rates (see Section 4c). The reason for these relationships may be similar to that posited to explain why such species should be more likely to establish viable populations following release: they may be less vulnerable to local extinction following colonization of unoccupied sites (Gaston 1988).

Whatever the reasons for the relationships just described, they suggest that the extent of spread by exotic invaders may depend on both characteristics of the species and of the location. This is in contrast to the likelihood of establishment in the first place, which seems to be primarily determined by idiosyncratic characteristics of the specific introduction event. Thus, location- and species-level effects may not determine which species make it into the exotic environment, but may be much more important in determining which species can spread across it.

6. Impact of avian introductions

Introduced species are organisms that have not evolved over time with the recipient community, so once established they have the potential to produce significant ecological changes. The importance of their impact will depend on a combination of the abundance, distribution and impact per individual of the invader (Parker *et al.* 1999). In the region of introduction, invaders are often released from the factors that could have limited their abundance and distribution, such as competitors, predators, pathogens or parasites (Torchin *et al.* 2003). This may allow them to grow in excess, spread over wide regions and become pests. Native species, on the other hand, may not possess mechanisms to respond to novel competitors, predators, pathogens or parasites, making them more vulnerable to invaders. Despite this, ecologists estimate that only a minority of species that are introduced cause major impact on the recipient community (Williamson 1996). The reasons why some species have greater impact than others remain largely unknown, and to uncover them should be a major goal of future research.

Birds have caused, and are still causing, a variety of ecological impacts in the regions where they have been introduced. Surprisingly, however, the impact of bird invaders has been largely under-appreciated by ecologists, especially when compared with that caused by other vertebrates (see e.g. Ebenhard 1988, Lever 1994). Most avian invaders occur in human-modified habitats rather than in pristine habitats (Case 1996), so their ecological impact is often assumed to be relatively unimportant. As a result, little effort has been expended in evaluating it rigorously. However, if we do not measure the impact of non-indigenous birds, we will never know the real magnitude of the problem. In addition, introduced birds not only cause ecological impacts but they also impose substantial economic costs to human societies (Lever 1994). Although our understanding of the quantitative ecological and economic impact of birds is currently poor, we have examples of several major effects of avian invaders on native individuals, populations, genetic pools and communities, as well as those on human societies.

a. Individual and population effects

Non-indigenous species may predate indigenous species, limit their access to resources through competition and transmit parasites and pathogens to them, all of which may negatively affect the native populations. Predation is perhaps the strongest impact of introduced vertebrates. This is clearly exemplified by the devastating effect of rats and cats introduced into islands that lacked native predators (Courchamp *et al.* 2003, Blackburn & Gaston 2005). In birds, predators are uncommon among the species that have ever been introduced, but a negative impact through predation has nonetheless been documented. For example, the Pacific Marsh-harrier (*Circus approximans*), introduced into Tahiti in 1880 to control introduced rats, is one of the causes of the imminent threat of extinction faced by the Polynesian Imperial-pigeon (*Ducula aurorae*) (Thibault, 1988).

Introduced birds may also affect native birds through competition for limited resources. In North America, for example, Common Starlings have been found to usurp nests of several North American hole-nesting species (Ingold 1996, 1998). Competition for either nesting sites or food supplies with natives has been suggested for over 20 introduced bird species (Lever 1994). However, there are surprisingly few instances in which competition with introduced species causes a decline in number of resident species (Davis 2003), so whether or not competition negatively affects entire

populations remains debatable. In the case of starlings, a recent comparison of densities of native cavity-nesting species before and after invasion of sites by the starling revealed that only five out of 27 species examined exhibited significant negative effects potentially attributable to starlings (Koenig 2002). Moreover, a further five species increased following starling colonization, including the Red-bellied Woodpecker (*Melanerpes carolinus*), one of the only species for which there was good evidence of a high frequency of nest usurpation by starlings. As Koenig (2002) points out "Despite their rapid spread, striking abundance, and aggressive nature, starlings appear thus far to have had little negative affect on the native cavity-nesting bird species with which they are known to interfere". It remains to be investigated if this conclusion also holds for the other introduced species suggested to compete with native species.

Introduced birds may also affect individuals and populations of native species through the transmission of parasites and pathogens. A well-studied example is the avian malaria that is strongly implicated in declines of native passerine birds in Hawaii (van Riper *et al.* 1986). Malaria was introduced to this island through exotic birds kept by settlers, and its transmission was facilitated by the subsequent introduction of the southern house mosquito (*Culex quinquefasciatus*). Native birds were not resistant to malaria and succumbed rapidly to its detrimental effects. Avian malaria has contributed to the extinction of at least 10 native species and threatens many more.

b. Genetic effects

Closely-related species sometimes interbreed and produce fertile hybrids. This phenomenon is relatively rare in nature, where interbreeding is usually avoided by the action of geographical, ecological, behavioural or morphological barriers. Yet, it may be facilitated when a species is introduced in a region that contains a close relative (Rhymer & Simberloff 1996). Given that alien and native species were previously separated by geographical barriers, they may have been less likely to have evolved ecological, behavioural or morphological mechanisms to avoid interbreeding.

Hybridization is a conservation issue because it may alter the genetic structure and reduce the fitness of native populations (Mooney & Cleland 2001). A number of cases corroborate the importance of this phenomenon in birds. In Europe, the long-term survival of the Endangered native White-headed Duck (*Oxyura leucocephala*) is threatened by hybridization with the American Ruddy Duck (*Oxyura jamaicensis*), an introduced species currently expanding on the European continent. Likewise, hybridization with introduced Mallards (*Anas platyrhynchos*) has been related to the population decline of the Pacific Black Duck (*Anas superciliosa*) (Rhymer & Simberloff 1996). Whilst hybridization is particularly common in ducks, it is also observed in other taxonomic groups. The nominate race of the Madagascar Turtle-dove (*Streptopelia picturata*), introduced to the Seychelles from Madagascar, has so massively hybridized with the local race *rostrata* that a hybrid form resembling the invaders now lives in the Seychelles.

c. Community effects

Introduced birds have the potential to alter the composition of the recipient community through a variety of mechanisms, although evidence for such an impact is only available for a few case-studies. One of these is the dispersal of seeds from the ornamental plant *Lantana* by Common Mynas introduced in the Hawaiian Islands (Lever 1994). This plant was introduced from Mexico in 1958 to local gardens, where it serves as a major food supply for Common Mynas. Thanks to subsequent seed dispersal by mynas, the plant has become an agricultural problem in the islands.

A second example of the impact of a bird invader on the community structure comes from Mute Swans (*Cygnus olor*) introduced in the USA: experimental exclosures have shown that grazing by swans affects the diversity and density of aquatic plants (Cobb & Harlin 1980). This is one of the few cases where the impact of a bird has been evaluated experimentally.

d. Effects to human societies

Invaders are widely recognized as the cause of significant economic and health problems to human societies, although the actual magnitude of these impacts has rarely been quantified. Perhaps the most common economic impact associated with introduced birds is the damage caused to agricultural crops. At least 37 naturalized species

from four taxonomic orders have been reported to affect crops significantly (Lever 1994). In Australia, for example, the Common Starling is a pest of soft fruits and cereals, causing the loss of 10–15% of certain crops. In general, species that are considered to be pests in their natural range also become pests in the places where they are introduced (Lever 1994), a pattern with which the Common Starling fits well. However, the reverse is not always true. Species that produce little damage in their natural range may become pests when introduced in places where the natural factors that limit their abundance and distribution are absent. The Ring-necked Pheasant (*Phasianus colchicus*), for example, is regarded as harmless in its native range in the Middle East and Far East, but causes significant losses to the agriculture in many of the regions where it has been introduced (Lever 1994).

Introduced birds may also act as a reservoir of severe diseases that affect humans and domestic animals. Feral pigeons, descended from Rock Doves introduced in many regions of the world, carry diseases such as salmonellosis, tuberculosis, ornithosis and Newcastle disease (Johnston & Janiga 1995). Whilst there is no direct evidence that the diseases have been passed from pigeons to humans, the risk cannot be discounted.

The literature also reports a variety of additional problems that avian invaders cause on human activities. In Britain, for example, the introduced population of Canada Geese (*Branta canadensis*) not only is regarded as causing significant agriculture damage, but also has been implicated in damage to amenity sites, eutrophication of waterbodies, and as a threat to aircraft safety (Wattola *et al.* 1996).

7. Solutions to the problem of avian invaders

The seriousness of the impacts of avian invaders should not be underestimated, given how unpredictable their effects are. Future exotic introductions should best be avoided, and strategies to deal with species that have already been introduced urgently need to be implemented. The solution to the problem of invaders will be difficult, but not impossible. Five types of measure appear to be priorities (Genovesi 2000, Myers *et al.* 2000, Genovesi & Shine 2002):

1. *Research.* This is usually the first cry of the researcher, but with good reason. Research is necessary to help prevent new invaders, to evaluate the ecological, economic and health problems the current invaders generate, and to develop efficient measures to help mitigate these problems. For decision-taking with respect to these issues, it is particularly important that we improve our ability to predict the consequences of introducing a given alien species. Good progress has been made in the last decades in our predictive power, as we hope to have demonstrated throughout this review, but important aspects remain to be investigated. Predicting the impact of introduced species is perhaps one of the major unresolved issues in birds, and in other organisms as well (Ricciardi & Rasmussen 1998, Parker *et al.* 1999). Assuming that we can define and measure impacts, we can, in principle, apply comparative methods to identify factors that distinguish introductions with little effect from those with large effect, as has been done for other invasion transitions. This information can then be used in risk-assessment models.
2. *Monitoring.* The development of monitoring programmes for alien birds is of key importance for the identification of alien introduction and invasion pathways, the early detection of invaders, and the assessment of alien threats. Given that birds have good dispersal abilities and may easily reach distant regions, this information should be made available to other countries through regional and global information systems (Ricciardi *et al.* 2000). Intensive monitoring is particularly feasible in birds, as birdwatching is a widespread activity in many regions of the world.
3. *Legislation.* Laws and regulations may serve to encourage countries to design management strategies, to prevent the import of high-risk species, to prohibit deliberate introductions and to force captive collections to implement measures that reduce the chance of escapes of non-native species. For example, because of the ecological problems associated with Ruddy Ducks, the UK government has, since 1995, prohibited trade in the species without licence (Hughes 1996). States are a potential source of avian invaders for other states, and hence they should take appropriate co-operative actions to minimize risks. The Bern Convention, for example, specifically states that the contracting parties must undertake strict control to prevent the introduction of non-native species.
4. *Mitigating impact.* The design of control strategies to limit or eradicate high-risk non-indigenous species is the only solution once a species is established. There exist a variety of methods to control or eradicate birds (Genovesi 2000), including

trapping, population sterilization, behavioural management and biological control. The decision to use one or another method will critically depend on the characteristics of the introduced population and the impact it produces. Although vertebrates are often difficult to control, success in reducing their population density and even reaching a complete eradication can be achieved in well-planned programmes (e.g. Myers *et al.* 2000). In the UK, for example, research into control programmes led to the conclusion that shooting was the most effective means to control the growing introduced population of Ruddy Ducks (http://www.unep-wcmc.org/aewa/eng/info.htm). After informing the public about the programme, and despite some controversy, a three-year trial started in the early 1990s to assess whether the eradication of the species was a feasible option. More than 2500 Ruddy Ducks were shot within this period, halving the population size. Based on these data, it was estimated that the UK Ruddy Duck population could be reduced to fewer than 175 birds in less than six years.

5. *Informing the public*. The public needs to be aware of the serious problems that introduced species generate, so that no further irresponsible introductions are carried out. The support of the public is also important to influence political decisions and, as we have just seen, for the successful implementation of control strategies.

The growing frequency of non-indigenous species is threatening global biodiversity, ecosystem functioning, national economies and human health, making it urgent that we implement strategies to mitigate this impact. Fortunately, and despite early scepticism, our understanding of the invasion process has significantly improved during the last few years. This has broadened our ability to predict and prevent invasions, providing a good starting-point for the development of regional and global strategies against invaders. Although much work still remains to be done, we should be optimistic about the possibility that the problems posed by non-indigenous birds can be solved in the not too distant future.

Daniel Sol
Tim Blackburn
Phillip Cassey
Richard Duncan
Jordi Clavell

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Introduction to Volume 10

It hardly seems a year since we were despatching Volume 9 to the printers. Indeed, only three years have gone by since we waved off the last of the non-passerine volumes, in the company of Errol Fuller's evocative foreword on extinct birds. At that time, how many of us honestly felt that the Ivory-billed Woodpecker (*Campephilus principalis*) should have been included in the foreword rather than in the main body of the Picidae text? How many believed the reports that the species might still exist in remote backwaters of such a modernized country as the USA, with such a vast birding public, when there had been no confirmed records for over 50 years? Conservation efforts, in all their many guises, can amount to an exceedingly depressing excercise, with massive personal input and often with virtually no returns to show for it all, but when the years and the countless expeditions in quest of such a creature are rewarded by the rediscovery of such a magnificent species as the Ivory-bill, it puts fresh heart into all of us. Perhaps, after all, there really is some reason in continuing the struggle.

As each volume comes round, we seem less capable than before of excluding material. This present volume includes what will be (we trust!) the longest family text in the entire series. We imagine that some may consider it too long, but we hope that most readers will agree with us that it is so packed with interesting detail that it would have been a great shame to have cut it back. Certainly, Turdidae contains many of the most familiar and best-studied of all bird species, so it should perhaps come as no surprise that this family should end up so long and detailed.

It has been quite an effort to fit all the material in between the covers, and this time we really have come very close to the limit: any more weight and the book simply would not hold together. Indeed, even to achieve this we have had to make a concession: rather than eliminate information, we have had to change to slightly thinner paper, in order to keep within the weight limit. The good news is that this volume was already predicted as being very long, and we foresee only one other of the remaining volumes as possibly struggling with the same sort of problem.

One reviewer has suggested that we ought to save pages by avoiding blank pages between some plates, either by tacking the information for one plate on to the end of the material for the previous plate, or by allowing the option of having full-page plates on right-hand pages. Readers will appreciate that we are keener than anybody to keep such blank pages to a minimum, but we hope that most would, like us, prefer to avoid either of the possible aforementioned solutions, as being both confusing and messy.

Continuing with our collection of selected essays on unrelated subjects related to birds, we are very pleased that the foreword in this volume is dedicated to a highly topical issue that affects the whole biosphere in a variety of ways, namely the subject of introduced species, in particular, of course, introduced bird species. The team of authors is made up of specialists on the subject, all of whom are involved in some of the latest and most detailed studies of this increasingly relevant issue.

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The other principal form of reference is bibliographical, and the number of references "processed" in one way or another just refuses to stop growing. We have received a great deal of assistance in this field from a wide array of generous sources. We should like to offer our particular thanks to the British Museum of Natural History at Tring (Alison Harding), the Bavarian Ornithological Society (Juliane Diller), the Darwin Museum in Moscow (Igor Fadeev), the Durban Natural Science Museum (David Allan), the H. L. White Library in Australia (Pamela Copley), the Muséum National d'Histoire Naturelle in Paris (Jacques Cuisin), the Museum of Zoology of the University of Michigan (Janet Hinshaw, Janet Griffin-Bell), the Niven Library in South Africa (Margaret Sandwith), the Royal Danish Academy of Sciences and Letters (Bjarne Stavnshøj), the Western Foundation of Vertebrate Zoology (Linnea S. Hall), the Yamashina Institute for Ornithology (Shigeki Asai), the Zoological Museum of State, Moscow (Eugeny Koblik), Richard Banks, Murray Bruce, Bob Dickerman, Diego Calderón Franco, Lloyd Kiff, Miguel Lentino, Vladimir Loskot and Travis Rosenberry.

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PASSERIFORMES

- Eurylaimi
  - Eurylaimidae (Broadbills)
  - Philepittidae (Asities)
  - Pittidae (Pittas)
- Furnarii
  - Furnariidae (Ovenbirds)
  - Dendrocolaptidae (Woodcreepers)
  - Thamnophilidae (Typical Antbirds)
  - Formicariidae (Ground-antbirds)
  - Conopophagidae (Gnateaters)
  - Rhinocryptidae (Tapaculos)
- Tyranni
  - Cotingidae (Cotingas)
  - Pipridae (Manakins)
  - Tyrannidae (Tyrant-flycatchers)
- Acanthisittae
  - Acanthisittidae (New Zealand Wrens)
- Menurae
  - Atrichornithidae (Scrub-birds)
  - Menuridae (Lyrebirds)
- Oscines
  - Alaudidae (Larks)
  - Hirundinidae (Swallows)
  - Motacillidae (Pipits and Wagtails)
  - Campephagidae (Cuckoo-shrikes)
  - Pycnonotidae (Bulbuls)
  - Chloropseidae (Leafbirds)
  - Irenidae (Fairy-bluebirds)
  - Aegithinidae (Ioras)
  - Ptilogonatidae (Silky-flycatchers)
  - Bombycillidae (Waxwings)
  - Hypocoliidae (Hypocolius)
  - Dulidae (Palmchat)
  - Cinclidae (Dippers)
  - Troglodytidae (Wrens)
  - Mimidae (Mockingbirds and Thrashers)
  - Prunellidae (Accentors)
  - Turdidae (Thrushes)
  - Cisticolidae (Cisticolas and allies)
  - Sylviidae (Old World Warblers)
  - Regulidae (Kinglets)
  - Polioptilidae (Gnatcatchers)
  - Muscicapidae (Old World Flycatchers)
  - Platysteiridae (Wattle-eyes)
  - Rhipiduridae (Fantails)
  - Monarchidae (Monarch-flycatchers)
  - Petroicidae (Australasian Robins)
  - Pachycephalidae (Whistlers)
  - Picathartidae (Rockfowl)
  - Timaliidae (Babblers)
  - Pomatostomidae (Pseudo-babblers)
  - ...
  - ...
  - Paradoxornithidae (Parrotbills)
  - Orthonychidae (Logrunner and Chowchilla)
  - Cinclosomatidae (Whipbirds and Quail-thrushes)
  - Aegithalidae (Long-tailed Tits)
  - Maluridae (Fairywrens)
  - Acanthizidae (Thornbills)
  - Epthianuridae (Australian Chats)
  - Neosittidae (Sitellas)
  - Climacteridae (Australasian Treecreepers)
  - Paridae (Tits and Chickadees)
  - Sittidae (Nuthatches)
  - Tichodromadidae (Wallcreeper)
  - Certhiidae (Treecreepers)
  - Rhabdornithidae (Philippine Creepers)
  - Remizidae (Penduline Tits)
  - Paramythiidae (Painted Berrypeckers)
  - Melanocharitidae (Berrypeckers and Longbills)
  - Nectariniidae (Sunbirds)
  - Dicaeidae (Flowerpeckers)
  - Pardalotidae (Pardalotes)
  - Zosteropidae (White-eyes)
  - Promeropidae (Sugarbirds)
  - Meliphagidae (Honeyeaters)
  - Oriolidae (Old World Orioles)
  - Laniidae (True Shrikes)
  - Malaconotidae (Bush-shrikes)
  - Prionopidae (Helmet-shrikes)
  - Vangidae (Vangas)
  - Dicruridae (Drongos)
  - Callaeatidae (Wattlebirds)
  - Grallinidae (Mud-builders)
  - Corcoracidae (White-winged Chough and Apostlebird)
  - Artamidae (Woodswallows)
  - Pityriaseidae (Bornean Bristlehead)
  - Cracticidae (Butcherbirds)
  - Paradisaeidae (Birds-of-paradise)
  - Ptilonorhynchidae (Bowerbirds)
  - Corvidae (Crows)
  - Sturnidae (Starlings)
  - Passeridae (Old World Sparrows)
  - Ploceidae (Weavers)
  - Estrildidae (Waxbills)
  - Viduidae (Indigobirds)
  - Vireonidae (Vireos)
  - Fringillidae (Finches)
  - Drepanididae (Hawaiian Honeycreepers)
  - Parulidae (New World Warblers)
  - Cardinalidae (Cardinals and allies)
  - Thraupidae (Tanagers)
  - Emberizidae (Buntings and allies)
  - Icteridae (New World Blackbirds)

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family CAMPEPHAGIDAE (CUCKOO-SHRIKES)



- Small to medium-sized passerines with broad-based bill, moderately long tail and thick, erectile rump feathers; some species brightly coloured.
- 13–38 cm.



- Sub-Saharan Africa, Malagasy, south and east Asia, Australasia and western Pacific islands.
- Forest, woodland, savanna, scrub and mangroves.
- 9 genera, 86 species, 316 taxa.
- 4 species threatened; none extinct since 1600.

Systematics

The family Campephagidae is currently considered to comprise nine genera in five distinctive groups. These are the cuckoo-shrikes in the genera *Pteropodocys*, *Coracina*, *Campephaga*, *Lobotos* and *Campochaera*, the trillers in the genus *Lalage*, the minivets in *Pericrocotus*, the flycatcher-shrikes in *Hemipus*, and the wood-shrikes in the genus *Tephrodornis*. The family is confined to the Old World and is mainly tropical in distribution, ranging from sub-Saharan Africa, the Malagasy Region and southern Asia eastwards to New Guinea, Australia and the islands of the south-western Pacific Ocean. One species, the Ashy Minivet (*Pericrocotus divaricatus*), is found as far north as south-east Russia and Japan.

The fossil record provides no direct evidence of the family's ancestry, but it has long been maintained that, in the case of *Coracina*, by far the largest genus in the family, the populations of the Indo-Australian Archipelago originated as a result of radiation from south and south-eastern Asia, and that the Pleistocene tropical Sunda Basin and the Australian mainland acted as important centres of speciation. This hypothesis proposes a common south Asiatic origin of all Afrotropical and Indo-Australian forms of *Coracina*. On the other hand, in addition to the fact that species diversity among the cuckoo-shrikes and the trillers is greatest in the area from Wallacea east to the Australia–New Guinea region, these groups are represented in this region by more diverse lineages, including at least five infrageneric groups of cuckoo-shrikes and three of trillers, and such local endemics as the Golden Cuckoo-shrike (*Campochaera sloetii*) and the Ground Cuckoo-shrike (*Pteropodocys maxima*). In view of these factors, it has also been proposed that this region was the likely cradle of evolutionary radiation. An origin in southern mainland Asia is assumed for the minivets, the flycatcher-shrikes and the wood-shrikes on the basis of their current distribution, which is centred on southern and south-eastern Asia.

Despite the vernacular name, cuckoo-shrikes are not related to either the cuckoos (Cuculidae) or the shrikes (Laniidae). The "cuckoo" part of the name probably derives from the grey coloration of many of the species, some of which also have conspicuous cuckoo-like barring on the underparts, and the name "shrike" from the strong, hooked and notched bill. Various other English names are applied to different species, including "greybird", obviously again because of the predominantly grey coloration of many, and "caterpillar-bird", because of the preponderance of caterpillars in the diet of several species. The name "cicadabird" is commonly given to a group of *Coracina* species that were formerly separated in the genus *Edolisoma* because of differences in bill shape and plumage (see Morphological Aspects), and is derived from the insect-like calls of some of these campephagids (see Voice). Likewise, the trillers are named for their calls, while the flycatcher-shrikes and the wood-shrikes bear a superficial resemblance to the laniid shrikes and, in the case of the former, are similar to the Old World flycatchers (Muscicapidae) in their foraging behaviour.

Traditional classifications place the family Campephagidae between the wagtails and pipits (Motacillidae) and the bulbuls (Pycnonotidae). Structurally, the family is corvoid, crow-like skeletal features including the humeral fossa, the configuration of the palate, the nasal bones and other parts of the skull, and the lack of an apterium in the spinal feather tract. In most of these features the cuckoo-shrikes resemble the Old World orioles



The most diverse campephagid genus, Coracina, *contains 50 species. Some of these are inconspicuous, while others are large and often seen in high, undulating flight over forests and open country, their bursts of wingbeats interspersed with downward glides on stiffly held wings. Although they are mainly distributed in continental south Asia and Australia, high mobility has led them to colonize remote oceanic islands in the Malagasy Realm as well as Indonesia, Polynesia and Melanesia, where they have diversified into a multitude of forms, such as the* ***South Melanesian Cuckoo-shrike****.*

[*Coracina caledonica caledonica,* New Caledonia. Photo: Roland Seitre]



When perched, members of Coracina *are elongated birds with the upright posture, short tarsi and weak feet associated with an arboreal lifestyle. They are known by many regional monikers, but most are now called "cuckoo-shrikes". Even though related neither to cuckoos (Cuculidae) nor shrikes (Laniidae), the name is fairly apt because they combine plumage patterns of the former and the stout hook-tipped bills of the latter. The* ***White-bellied Cuckoo-shrike*** *is typical in its soft, dense plumage, and in lacking any hint of bright colour. Like many of its congeners it is essentially grey, with darker feathering on the wings, tail and head.*

[*Coracina papuensis artamoides*, Georgetown, Queensland, Australia. Photo: Graeme Chapman]

(Oriolidae), a group to which they were for long thought only distantly related. DNA–DNA hybridization first indicated a close relationship to the Oriolidae, and led C. G. Sibley and B. L. Monroe to combine the cuckoo-shrikes and the orioles into one tribe, the Oriolini, within their expanded family Corvidae. Studies of proteins corroborate a close association between the orioles and the cuckoo-shrikes. There are also, however, significant structural differences between the two groups, including some features of the skull, and the possession of ten secondaries, as opposed to the eleven commonly found in the orioles. The erection of the tribe Oriolini has not, therefore, gained general acceptance, and the Campephagidae and Oriolidae have subsequently been retained as separate families, pending further study. It should also be noted that the trillers in the genus *Lalage* have all the cranial features of the cuckoo-shrikes.

The genus *Chlamydochaera*, with only one species, the Black-breasted Fruithunter (*Chlamydochaera jefferyi*) of Borneo, was originally included in the Campephagidae, but it has the distinctive syringeal morphology of the true thrushes (Turdidae) and the muscicapid flycatchers, while DNA–DNA hybridization studies also suggest a turdine relationship. In addition, S. L. Olson has pointed out that the morphology of the humerus corroborates this placement and further negates any possible relationship with the Campephagidae. On plumage and zoogeographical grounds, *Chlamydochaera* is probably closely related to the turdine genus *Cochoa*.

Retention of the genus *Tephrodornis* in the Campephagidae is problematical. DNA–DNA hybridization indicates that the genus is related to the helmet-shrikes (Prionopidae), and not to the orioles, and Sibley and Monroe placed it in the tribe Vangini, as part of the bush-shrike subfamily Malaconotinae, within their enlarged Corvidae. Although such evidence suggests that *Tephrodornis* should perhaps be moved into the shrike assemblage, such a change is considered premature without more corroborative evidence.

The validity of two genera within the cuckoo-shrike assemblage is open to debate. The monotypic genus *Pteropodocys* is split from *Coracina* on the basis of its morphology. It is a ventrally barred, long-tailed, predominantly grey species, with a short bill and strong legs and feet, and the sexes are alike in plumage. Some authorities, however, regard these characters as insufficient for separation from *Coracina*, and they retain the Ground Cuckoo-shrike in that genus, or accept *Pteropodocys* as having subgeneric rank, on the grounds that it may be more closely related to some *Coracina* taxa than are other, undisputed members of the latter. The two wattled cuckoo-shrikes from Africa are sometimes retained in *Campephaga*, but they are probably better separated in the genus *Lobotos* on the basis of their prominent facial wattles, colourful plumage and lack of strong sexual dimorphism. The two have discrete, non-overlapping ranges and are sometimes regarded as conspecific, but the male plumages are distinct, and it seems better to treat them as separate species forming a superspecies.

As described later (see Morphological Aspects), the cuckoo-shrikes treated as comprising the genus *Coracina* fall into two groups. The *Coracina* cuckoo-shrikes *sensu stricto* are larger, broader-billed and usually sexually monomorphic, whereas the cicadabirds, forming the "*Edolisoma* group", are smaller, more slender-billed and usually sexually dimorphic. A third group, containing two similarly small species, was once treated as constituting the genus *Volvocivora*; it, too, may be distinguishable and may form a link with the *Lalage* trillers, although it is sometimes included in a subgenus *Ceblepyris*. Efforts to determine whether these are natural groups, deserving generic recognition, are hampered by the limited amount of study that they have received and by disagreements among various authors, who have usually reviewed only part of the assemblage. Genetic comparisons may well indicate that the current taxonomy is in need of revision and that the division of *Coracina* into several genera may be appropriate.

Although there is still no general agreement on species limits within *Coracina*, the tendency in recent years has been to separate distinctive taxa formerly included in broad species. A good example is provided by *C. novaehollandiae*, in which were previously united many forms occurring from India east to Australia, in a somewhat arbitrary arrangement. This broad taxon has now been split into the Large Cuckoo-shrike (*Coracina macei*), the Javan Cuckoo-shrike (*Coracina javensis*), the Wallacean Cuckoo-shrike (*Coracina personata*) and the Black-faced Cuckoo-shrike (*Coracina novaehollandiae*); and all are included in a superspecies, along with the South Melanesian (*Coracina caledonica*), North Melanesian (*Coracina welchmani*), Buru (*Coracina fortis*), Moluccan (*Coracina atriceps*) and Slaty Cuckoo-shrikes (*Coracina schistacea*), and possibly also the Stout-billed Cuckoo-shrike (*Coracina caeruleogrisea*). The race *pollens* of the Wallacean Cuckoo-shrike was once considered a full species within this group. The four Solomon Islands races comprising *C. welchmani* have together been returned their former



In comparison with the forms called cuckoo-shrikes, cicadabirds tend to be smaller, lighter-billed and sexually dimorphic. Males are grey, much like cuckoo-shrikes, while females have brown, reddish or grey upperparts, barred underparts and complex face-patterns, as illustrated by this ***Slender-billed Cicadabird****. As their name suggests, they produce insect-like trills that differ widely from the more strident calls of cuckoo-shrikes. Given that* Coracina *embraces this level of morphological and vocal discontinuity, the results of future genetic analysis may prompt its subdivision into two or more genera, with cicadabirds returning to* Edolisoma.

[*Coracina tenuirostris grayi*, Halmahera, Indonesia. Photo: Morten Strange]

species status, separate from *C. caledonica*, on the bases of plumage, iris colour, voice, and habitat preferences.

Nevertheless, the separation of *C. macei* and *C. javensis* remains unresolved, with all eight subspecies of the former sometimes being placed in the latter. Crucial to this question is whether the Peninsular Malaysian subspecies *larutensis*, currently included in *C. macei*, should be included in *C. javensis*. It is assumed that the latter should incorporate only the populations of Java and Bali, but further research may dispute this. Moreover, differences in calls and morphology also suggest that the nominate race and the subspecies *layardi* of *C. macei* could together represent another, distinct species.

Confined to Africa, the genus *Campephaga* contains four species. Three of these are broadly allopatric and are included in a superspecies, but they present a complex taxonomic situation. The Black Cuckoo-shrike (*Campephaga flava*) and Petit's Cuckoo-shrike (*Campephaga petiti*) overlap in range in western Kenya, eastern DRCongo and north-western Angola, but they are largely separated by the latter's preference for true forest, the Black Cuckoo-shrike occurring in woodland and at forest edges. Females or young males from the Rwanda Rift and from Angola, however, have underparts that are strongly yellow, as in Petit's Cuckoo-shrike, but also well barred, as in the Black Cuckoo-shrike, suggesting that they are hybrids between the two. This appears to be a case of incomplete genetic isolation and, although the two species are sometimes considered conspecific, they are probably better treated as allospecies with marginal distributional overlap.

The relationship of the Red-shouldered Cuckoo-shrike (*Campephaga phoenicea*) to the Black Cuckoo-shrike is uncertain, and the two are sometimes considered conspecific on the basis of some assumed interbreeding. Their breeding ranges overlap only in south-western Ethiopia and western Kenya, and no males of intermediate appearance are known. On the other hand, some female Black Cuckoo-shrikes from central and eastern Kenya, outside the range of the Red-shouldered Cuckoo-shrike, have yellow in the tail that is intermediate in extent between the amounts exhibited by typical females of the two respective species, suggesting incomplete genetic isolation. In the areas where males and females of both species occur, all three female tail patterns are found, but differences are not sufficiently clearly defined to point to further intergradation. Where the Red-shouldered and Petit's Cuckoo-shrikes overlap geographically, in Cameroon and north-eastern DRCongo, they are ecologically separated and no interbreeding is suspected.

In the genus *Lalage*, the White-rumped Triller (*Lalage leucopygialis*) is often treated as a subspecies of the Pied Triller (*Lalage nigra*), and its systematic position is unclear. The two have non-overlapping ranges, and some authors regard them as forming a superspecies, which seems not unreasonable. On the basis of plumage characters, however, the White-rumped Triller would appear to be less close to the Pied Triller than is the White-shouldered Triller (*Lalage sueurii*), a form likewise treated as a



The ***Ground Cuckoo-shrike*** *is most peculiar. Not only is it the largest member of the family, but its deeply forked tail and terrestrial habits are unique. It lives in the arid interior of Australia, where it runs about on long legs in open acacia scrub, spinifex* (Triodia), *and grassy plains with scattered trees, its head bobbing back and forth all the while. Despite this suite of anomalous features, and its traditional placement in* Pteropodocys, *the Ground Cuckoo-shrike is patterned like many species of* Coracina, *and the two genera are sometimes merged.*

[*Pteropodocys maxima*, Meekatharra, Pilbara, Australia. Photo: Simon Nevill/ Lochman Transparencies]



The genus Lalage *is essentially Australasian in origin, but representatives have reached islands as far afield as the Nicobars, the Philippines, and Samoa. It contains twelve species of triller, the males of which are small and relatively slender-billed, boldly patterned in black and white on the upperparts, usually with prominent patches of white on the wings, rump and supercilium. The underparts are generally white, the exception being the* ***Rufous-bellied Triller****, which is almost entirely rufous below. Females are similar to males but duller, usually with some dark barring or scaling.*

[*Lalage aurea*, Halmahera, Indonesia. Photo: A. Greensmith/ Ardea]

valid species herein. It is sometimes suggested that the White-shouldered and Pied Trillers might be conspecific, but they may occur sympatrically in Java; the situation there, however, is unclear and further study is required. On current information, it may make more sense to treat the White-shouldered Triller as forming a superspecies with the White-winged Triller (*Lalage tricolor*) of Australia and south-east New Guinea, and indeed these two are sometimes considered conspecific, although they are quite distinct in terms of plumage. Just to add to the confusion, the White-winged Triller is the only *Lalage* species in which the male is known to have an "eclipse" non-breeding plumage (see Morphological Aspects). The most aberrant species in the genus, the Samoan Triller (*Lalage sharpei*), which lacks sexual dimorphism and has a characteristically juvenile-type plumage, is sometimes placed in a monospecific genus, *Oscarornis*.

Swinhoe's Minivet (*Pericrocotus cantonensis*) is often considered conspecific with the Rosy Minivet (*Pericrocotus roseus*), primarily because, where the summer ranges of the two meet in southern Guangdong, in China, a small and, possibly, now stable population with mixed characters occurs in the valley of the River Sijiang, apparently as a result of interbreeding. This population was described as a separate species, *P. stanfordi*, in 1913, and it has also been regarded as representing a subspecies of the Rosy Minivet. There is, however, no sign that Swinhoes's and Rosy Minivets hybridize elsewhere in southern China in the region where their ranges closely approach or overlap one another, and the zone of occurrence of *stanfordi* is sufficiently restricted to suggest that the parent forms now behave as separate species. They are considered to form a superspecies.

For many years, the Long-tailed Minivet (*Pericrocotus ethologus*) was erroneously included with the sympatric Short-billed Minivet (*Pericrocotus brevirostris*). It was not until 1940 that E. Mayr distinguished between the two forms, which occur side by side over a wide range, from the eastern Himalayas to Myanmar, South-east Asia and southern China. The taxonomy at the subspecies level is still unclear, with some specimens not yet properly assigned. Further, the race *affinis* of the Short-billed Minivet is sometimes merged with the nominate race, a treatment which may be warranted but requires additional study. Some supposed *affinis* are apparently synonymous with the Long-tailed Minivet, and a more detailed review of specimen material is needed in order to resolve this matter.

Morphological Aspects

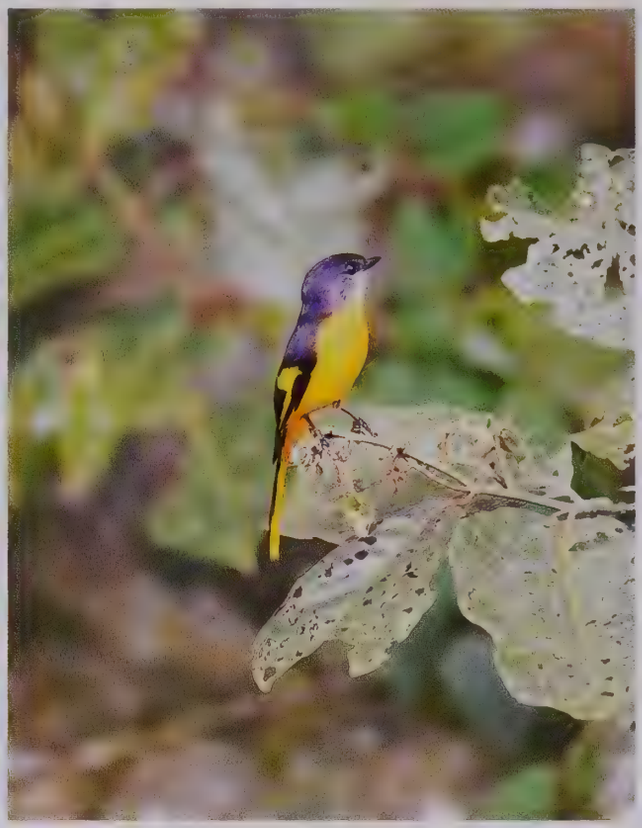
Members of the Campephagidae are small to medium-sized, mainly arboreal birds of conventional passerine form. The name "cuckoo-shrike" is normally applied to members of the genera *Coracina*, *Campephaga*, *Lobotos*, *Pteropodocys* and *Campochaera*, and these include the largest species in the family. The range of body sizes of these is, however, considerable. The Black-headed (*Coracina melanoptera*) and Lesser Cuckoo-shrikes (*Coracina fimbriata*) are 19–20 cm long and weigh only 24–36

The genus Campephaga *contains four closely related African species, all of which are slim with small bills and rather long, graduated tails. Sexual dichromatism is extreme, the males being glossy black with patches of colour at the gape and shoulder, like this* ***Black Cuckoo-shrike****. Females, meanwhile, are mostly olive-green above, yellow or white below, and prominently barred. Some of these species inhabit forests, others savanna, and they present a rather challenging taxonomic puzzle, with interbreeding reported in some regions, but not in others.*

[*Campephaga flava*, Nylsvley, Limpopo, South Africa. Photo: Warwick Tarboton]







The unassuming colour scheme of most campephagids is turned on its head in the Pericrocotus *minivets. This genus contains twelve diminutive upright-perching species, most of which are instantly recognizable by their vivid patterning and energetic charisma. Sexual dichromatism is usually acute, the scarlet or fiery orange of males being replaced by bright lemon-yellow in females. Like most of its congeners, the* ***Grey-chinned Minivet*** *has a long tail, a small bill, and feeble legs. Similarly, it lives in small, talkative groups which spend most of their time in the canopy.*

[*Pericrocotus solaris montanus*, Fraser's Hill, Malaysia. Photos: Morten Strange]

g, whereas, at the other extreme, the Ground Cuckoo-shrike is 31–38 cm long and weighs up to 155 g, and the South Melanesian Cuckoo-shrike can reach 180 g in weight. As is the case throughout the family, there is apparently little sexual dimorphism in size, but males tend to be slightly larger than females, For example, males of the Stout-billed Cuckoo-shrike weigh 127–170 g, while the females are 116–142 g in weight.

Cuckoo-shrikes have an elongated body and are typically quite slim. They have fairly long, pointed wings with ten primaries, and a moderately long, rounded or graduated tail with twelve rectrices. The Ground Cuckoo-shrike is unique in having a deeply forked tail. The bill is often rather stout, broad at the base, generally well hooked at the tip and strongly notched, and it is curved along the culmen. The nostrils are rounded, and are largely or completely obscured by the frontal feathering and the well-developed rictal bristles, an adaptation both to frugivory and to the consuming of hard-shelled insects. The tarsi are short, scutellated at the front and smooth at the rear, and the feet are characteristically coarsely scutellated, typically small and rather weak, and suited only for perching. There is one exception, the Ground Cuckoo-shrike, which has long, sturdy legs and long toes, characters adapted to its largely terrestrial existence.

The plumage is dense and soft. The shafts of the thickly downed feathers on the lower back and rump are often stiffened and enlarged, and are partly erectile and spine-like. These feathers may be puffed up over the back in display or defence, and they are easily shed, possibly as a defence mechanism, as occurs with the trogons (Trogonidae) and the pigeons (Columbidae). In addition, cuckoo-shrikes frequently carry powder-downs, hidden on the sides of the body and the back, and the uropygial glands, used for preening purposes, are much reduced.

Plumage patterns among the cuckoo-shrikes vary, from being virtually monomorphic to strongly sexually dimorphic. The Ground Cuckoo-shrike and, within the now enlarged genus *Coracina* (see Systematics), the *Coracina* species *sensu stricto* are relatively large and broad-billed, and tend towards monomorphism in plumage characters. Apart from the Cerulean Cuckoo-shrike (*Coracina temminckii*), which is predominantly greyish-blue, the males are largely grey to blackish, sometimes with black on the head; the underparts are sometimes paler grey or white, occasionally barred, and rarely, as demonstrated by the Black-bellied Cuckoo-shrike (*Coracina montana*), black. The females of these species are paler than the males, with less black on the head, and are often barred on the underparts. In contrast, the members of the "cicadabird group", formerly separated into the genus *Edolisoma*, are smaller, with a more slender bill, and are usually sexually dimorphic in plumage, with most males resembling "typical" *Coracina* species but the females having distinctive patterns of brown, reddish and grey upperparts and barred underparts. The male New Guinea Cuckoo-shrike (*Coracina melas*) is all black and the female entirely rufous-brown, while the females of the Mauritius (*Coracina typica*) and Reunion



When it comes to canopy flocks of passerines in tropical Asia, minivets usually steal the show. This photograph captures a typical view overhead: a couple of birds move into some bare twigs in the early light. One of them, a ***Scarlet Minivet****, takes off to reveal the dazzling patches of colour in its wings and tail, and the other goes unwatched and unidentified. Before they vacate a tree, minivets often perch prominently right on top of the canopy. After they set off for their chosen destination, their flight is direct but fluttery, with the long, graduated tail held partially open.*

[*Pericrocotus flammeus andamanensis*, Havelock Island, Andamans. Photo: Konrad Wothe]



Most minivets are birds of humid montane forests, but a few inhabit drier or more stunted formations right down to sea-level, including strand forest and mangroves. Others, like the ***Short-billed Minivet****, are partial to stands of conifers or montane pine forests, and this species ascends to nearly 3000 m in summer. Only in the 1940s was it realized that the then-accepted species in fact comprised two morphologically similar, yet broadly sympatric species, one of which was redaubed the Long-tailed Minivet* (Pericrocotus ethologus) *—which just goes to prove that not all "cryptic species" are dreary to look at!*

[*Pericrocotus brevirostris*, Bhutan. Photo: Roland Seitre]

Cuckoo-shrikes (*Coracina newtoni*) have brown upperparts and, respectively, chestnut or barred underparts.

The four *Coracina* species of Africa are medium-sized, with a rather stout bill. They have a tail of medium length and almost square-ended, the outermost feathers being slightly shorter than the rest. In three species the plumage is grey, or grey and white, but that of the Blue Cuckoo-shrike (*Coracina azurea*) is almost entirely brilliant glossy blue. The sexes are similar, the females being only slightly less boldly patterned and coloured than the males. The other African cuckoo-shrikes are very different. The four *Campephaga* species are slim, with a relatively small bill and a rather long, graduated tail, and they exhibit very strong sexual dimorphism in plumage. The males are predominantly glossy black, with orange or yellow gape wattles, while the Red-shouldered Cuckoo-shrike has red or orange lesser and median upperwing-coverts, and the Black Cuckoo-shrike often has yellow lesser coverts. The females in this genus are mostly olive-green on the upperparts and yellow or white on the underparts, and those of all species except Petit's Cuckoo-shrike have pronounced dark barring on the underparts and, variably, on the upperparts. The two wattled cuckoo-shrikes, constituting the genus *Lobotos*, have a smaller bill and very prominent orange to yellow wattles below the eye; their plumage is predominantly green above and yellow or orange below, while the head is blackish. The sexes are similar, but the female is duller, with smaller wattles.

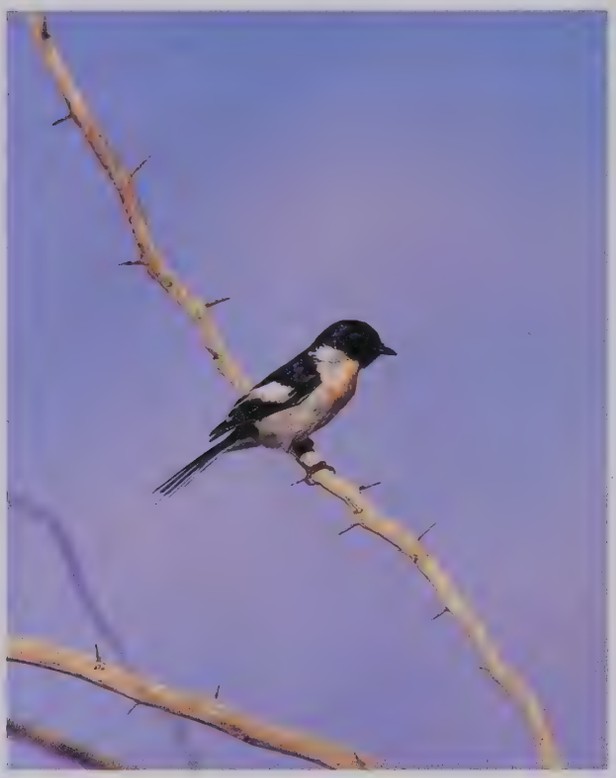
Farther east, the Golden Cuckoo-shrike, confined to New Guinea, is a small species with a small bill and much yellow in the plumage. The female has much the same coloration and pattern as the male, but in a washed-out version.

Immature and juvenile plumages are not described for many species in the family. Moreover, plumage sequences are sometimes difficult to interpret, especially for African species, because no proper distinction is made in published descriptions between the first plumage, referred to as the "juvenile", and that acquired at the post-juvenile moult, the "immature" plumage. Nevertheless, a characteristic of the Campephagidae appears to be that the immature plumage resembles that of the adult female. The juvenile plumage pattern is often basically similar to that of the immature, but duller, usually with pale and, in some cases, also dark scaling on the upperparts, and often with dark bars or scales on the underparts; the remiges and rectrices may have pale edges and, sometimes, pale tips. The Stout-billed Cuckoo-shrike is unusual in that the newly fledged young are predominantly whitish-grey, with some dark grey on the head, breast and wings, and with whitish upperwing-coverts.

The trillers in the genus *Lalage* are smaller birds, with relatively long legs, a rather short, slender bill, and a medium-long tail which varies, according to species, from almost square-ended to slightly graduated. The plumage is dense and soft, and the rump feathers do not have spiny shafts. In males, the head and upperparts are boldly patterned in black and white, usually with a prominent white wingbar and a pale rump, and often with a white superciliary stripe. The underparts are generally white, but the male Rufous-bellied Triller (*Lalage aurea*) is almost entirely rufous below. The females are typically patterned like the males but are duller, the black of the upperparts being replaced by brown to grey, and those of most species show some dark barring or scaling on the underparts. The two triller species which inhabit oceanic islands at the extreme eastern limit of the family's range differ quite markedly in plumage from their congeners. The first of these, the Polynesian Triller (*Lalage maculosa*), is very variable, the males of several of its 16 island subspecies being brown, rather than black, and some having dark barring and a rufous wash on the underparts. The Samoan Triller, which, with a length of 13 cm, is one of the smallest species in the family, has entirely brown upperparts and barred underparts, has virtually lost all white patterning in the wings, and is sexually monomorphic.

Of particular interest is the White-winged Triller of Australia and south-east New Guinea. This is the only campephagid in which the male is known to have two plumages yearly. Its black-and-white breeding plumage is replaced in the post-breeding moult by a so-called "eclipse" plumage, which resembles that of the brown female except that the remiges and rectrices remain black. The White-shouldered Triller, with which the White-winged Triller is often considered conspecific (see Systematics), does not possess this eclipse plumage. It has been suggested that the male Long-tailed Triller (*Lalage leucopyga*) may also have an eclipse plumage, but this is unconfirmed.

The two flycatcher-shrikes in the genus *Hemipus* have a relatively flat bill, which is very much depressed and is comparatively wide at the base. The rictal bristles are small, and the nostrils are more or less hidden by hairs. The tail is narrow and graduated, the wings fairly long and pointed, and the legs and feet



*The **White-bellied Minivet** is an outlier in the genus* Pericrocotus, *almost completely lacking the rich carotenoid pigmentation of its relatives. It is essentially black above and white below, with a reddish flush on the chest; in other words, it is somewhat* Saxicola*-like in pattern, if not behaviour. Not only is it exceptional in inhabiting low-stature dry forest, shrubland and semi-desert in the Indian Subcontinent, but its undulating flight is also unusual. Its affinities deserve further investigation, as does the taxonomic status of the race* albifrons, *a poorly known but highly divergent form from the basin of the Irrawaddy, in Myanmar.*

[*Pericrocotus erythropygius erythropygius*, Kachchh, Gujarat, India. Photo: Otto Pfister]

small; the rump feathers do not have spiny shafts. Like the trillers, the flycatcher-shrikes are sexually dimorphic in plumage. The males are black and white above, although the Black-winged Flycatcher-shrike (*Hemipus hirundinaceus*) lacks a white wingbar, and greyish-white below, while the females have the black replaced by grey or brown. In the race *leggei* of the Bar-winged Flycatcher-shrike (*Hemipus picatus*), however, the female is black and white, like the male.

Although bearing a superficial resemblance in plumage pattern to the true shrikes of the family Laniidae, the two wood-shrike species in the genus *Tephrodornis* differ from them in having a smaller head, a longer bill, a short tail, soft plumage and smaller legs and feet. The tail is square-ended, and the wings are moderately long and rather rounded. The very stout bill is about three-quarters the length of the head, is quite wide at the base, and is strongly hooked and notched. The nasal bristles are very numerous, entirely concealing the nostrils. The rump feathers are very ample, but are soft, and not spinous. Both species have greyish-brown upperparts, a black mask, white on the rump, and greyish-white underparts, and the Common Wood-shrike (*Tephrodornis pondicerianus*) also has a white supercilium. The sexes are more or less alike, the female being rather duller than the male, with a browner mask.

The smallest members of the family are the twelve minivets that make up the genus *Pericrocotus*. They are about the size of a wagtail (*Motacilla*), with moderately long wings and a long and steeply graduated tail. Although the Small Minivet (*Pericrocotus cinnamomeus*) is 16 cm long, its tail accounts for about half of its length, and the bird weighs only 6–12 g. The bill of minivets is relatively short, moderately broad at the base, and rather high, with a slightly curved culmen. The nostrils are partly concealed by frontal plumes, and the rictal bristles are few and insignificant. The legs and feet are short and rather feeble, and the claws are well curved. The shafts of the rump feathers are spiny, as in the cuckoo-shrikes. Most minivet species have brilliantly coloured plumage, the males being of a striking red and black, and the females yellow or orange and blackish to grey.

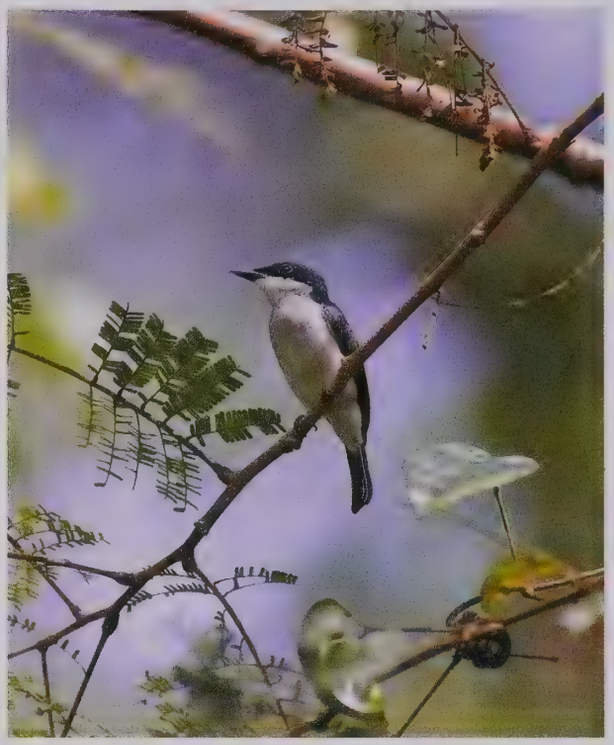
Moult in the Campephagidae is imperfectly known, but sufficient information is available to suggest that the typical pattern in the family is of a complete post-breeding moult and a partial pre-breeding moult. In the complete moult, the primaries are shed descendantly over a period ranging from two months to five months, the rectrices are usually moulted centrifugally, usually at the same time as the primaries, and moult of the head and body plumage commonly begins before the primary moult starts and continues after primary moult is complete.

The young of most species appear to undergo a partial post-juvenile moult, involving all or most of the body feathers, the marginal wing-coverts, most or all the median coverts, some or all the greater secondary coverts, and sometimes some tertials and/or rectrices. This post-juvenile moult usually results in the acquisition of a female-like immature plumage, and is followed by a partial pre-breeding moult in which most species acquire an adult-type plumage, although some do not gain full adult body plumage until after the first post-breeding moult. Thus, the Mauritius Cuckoo-shrike loses its juvenile body plumage within about



The two wood-shrikes in the genus Tephrodornis *are also placed with the Campephagidae. Both are relatively small, short-tailed and prominently hook-billed, with a pad of bristly hairs concealing the nostrils. They are grey, with paler rumps, darker masks, and, in the case of the **Common Wood-shrike**, a white supercilium. Both inhabit a variety of wooded formations, including tall scrub, bamboo, deciduous forest, and open evergreen forest, where they are a regular, if not particularly conspicuous, component of canopy flocks.*

[*Tephrodornis pondicerianus*, Ranthambore Sanctuary, Rajasthan, India. Photo: Gertrud & Helmut Denzau]



Another anomalous campephagid duo is made up of the flycatcher-shrikes in the genus Hemipus. *Of these, the* ***Black-winged Flycatcher-shrike*** *is typically pied, with black upperparts and white underparts. In females, the black is replaced with grey or brown. Both species have an odd bill, broad-based and laterally compressed, as befits their foraging tactic. In stance and pattern the males are reminiscent of some* Myiagra *(Monarchidae) or* Ficedula *(Muscicapidae) flycatchers, and likewise they sally to catch flying insects. Flycatcher-shrikes, however, often accompany mixed-species flocks in the canopy.*

[*Hemipus hirundinaceus*, Panti Forest, Malaysia. Photo: Morten Strange]

two months, attaining a plumage like that of the adult female, although some males develop partly adult whitish underparts. Individuals attain complete adult plumage only with the first complete post-breeding moult, more than a year after hatching.

The Ashy Minivet is unusual in having two complete moults in each year.

Habitat

The principal or, often, the only habitat exploited by 73 of the 86 species in the family is forest. Together, these occupy a wide range of forest types, including tropical or subtropical rainforest, swamp-forest, moss forest, vine forest, bamboo forest, monsoon forest, eucalypt (*Eucalyptus*) forest, deciduous forest, including oak (*Quercus*) forest, and pine (*Pinus*) forest. A few species, such as the New Caledonian Cuckoo-shrike (*Coracina analis*), the Hooded Cuckoo-shrike (*Coracina longicauda*) and the Golden Cuckoo-shrike, are restricted to primary forest, but the majority are apparently able also to utilize, at least to a limited extent, secondary forest, forest edges and the edges of clearings, selectively logged forest and other degraded forest habitats. In Kibale, Uganda, Petit's Cuckoo-shrike has even been recorded as commonest in logged areas with dense undergrowth and a sparse canopy, but this is exceptional. Riparian or gallery forest and forest patches are also occupied by some species, while many occur in mangroves as well. Almost all species are predominantly or exclusively arboreal, and many are found mainly in the upper levels or canopy of tall trees.

Many of the primarily forest-dwelling species can sometimes be found in other habitat types, such as woodland, wooded cultivation and watercourses, evergreen thickets, orchards and even savanna. Some may forage in artificially created or modified habitats, such as old or overgrown plantations of rubber, coconut, teak (*Tectona*), pine or wattle (*Acacia*), and even in parks, avenues and suburban gardens.

A few species are adapted to woodland or more lightly timbered habitats, rather than true forest. On Sulawesi, for example, the widespread and common White-rumped Cuckoo-shrike (*Coracina leucopygia*) exploits open wooded areas, lightly wooded cultivation, secondary woodland and scrub with trees. In Africa, the White-breasted Cuckoo-shrike (*Coracina pectoralis*) occurs in acacia (*Acacia*) savanna north of the equator, whereas in southern Africa it inhabits tall, broadleaf woodland such as brachystegia (*Brachystegia*), *Baikiaea* and mopane (*Colophospermum mopane*). The White-winged Triller in Australia is found in a wide range of lightly timbered habitats with a sparse, open shrub layer and grassy ground cover, particularly in dry, open eucalypt woodland, as well as in sparsely wooded farmland. It does not occur in heavily forested areas, except where clearing has taken place. In arid and semi-arid zones, it is often attracted to flowering shrubs and trees, and on migration it occurs in open country with trees, and sometimes in coastal casuarina (*Casuarina*) groves.

More open, less wooded areas are favoured by another Australian campephagid, the Ground Cuckoo-shrike. This species is



As with most aspects of their natural history, there are few details on record about the general habits of campephagids, and little can be said of their comfort behaviour until detailed field studies are undertaken. They are known to sunbathe in typical fashion, either on branches or on the ground, as this ***Black-faced Cuckoo-shrike*** *attests. In raising its sunlit feathers it shows off one feature that binds the Campephagidae as a family: the long plush feathering of the rump and lower back. Interestingly, in* Coracina *at least, these feathers have spiny shafts and sharp tips, and come away easily when the bird is alarmed.*

[*Coracina novaehollandiae*, Jervis Bay, New South Wales, Australia. Photo: Graeme Chapman]



Many Coracina *species advertise their presence with far-carrying and distinctive vocalizations. These are given either in flight, or while perched prominently at the tops of trees, with such regularity that they are a familiar background noise in many Asian and Australasian forests. The* ***Large Cuckoo-shrike****, for example, produces loud parrot-like screeches as well as chuckling notes, though calls do vary regionally. Most campephagid vocalizations seem to be trills, churrs, chatters, whistles or squawks of some sort, often in repetitive series. They are not known to produce complex songs.*

[*Coracina macei larutensis*, Fraser's Hill, Malaysia. Photo: Morten Strange]

often found in dry places, including acacia scrub and spinifex (*Triodia*), and grassy plains with scattered trees or shrubs. Although its preferred habitats have little or no ground cover, they do usually contain at least scattered trees. The extreme example of the utilization of very dry habitats with no trees is presented by the White-bellied Minivet (*Pericrocotus erythropygius*) in the Indian Subcontinent. This fascinating bird ranges from savanna to dry thorn-scrub, grassland, dry cultivation, hedgerows, rocky scrub-covered slopes and, occasionally, semi-desert.

Some campephagid species may be regarded more as habitat generalists, exploiting a very wide range of vegetation types, including forest, woodland, savanna and cultivated areas. The White-bellied Cuckoo-shrike (*Coracina papuensis*), for instance, is found in woodland, savanna, many types of forest, secondary growth, mangroves, coconut, teak and *Araucaria* pine plantations, wooded farmlands and suburban gardens. In south and Southeast Asia, the widespread Large Cuckoo-shrike, as well as inhabiting open, light and secondary forest, including those of teak, pine and oak, also frequents savanna, open and cultivated areas with scattered trees, and gardens. Likewise, the Black Cuckoo-shrike in Africa can occur in virtually any woodland or forest habitat, and less commonly in savanna, scrub, semi-arid bush, gardens and exotic plantations. In areas of overlap with more forest-dependent species, it is more restricted to forest edge, woodland and savanna. Among the minivets, the Small Minivet utilizes forest, woodland, mangroves, thorn-forest, strand woodland, casuarinas, scrub, orchards and other cultivated lands, preferring more open wooded habitats than those used by most of its congeners. Similarly, the Common Wood-shrike occurs in open forest, dry deciduous forest, secondary growth, bamboo forest, woodland, scrub, orchards, gardens, hedgerows, and dry open country with scattered trees. Among the trillers, the White-shouldered Triller is found in woodland, savanna, open forest, scrub, mangroves, overgrown cultivation, including rice fields, swamps, gardens and near human habitations.

Migratory species may tolerate a wider range of habitats during passage or in the non-breeding areas, often entering degraded or cultivated habitats, sometimes near human habitations. Thus, the Black-winged Cuckoo-shrike (*Coracina melaschistos*), which inhabits mainly deciduous forest, forest edge, groves and bamboo jungle, can be found in winter also in gardens, abandoned cultivation, open areas and woodland. The Ashy Minivet, a long-distance migrant, breeds in a broad variety of habitats, including evergreen and deciduous forests, secondary growth, woodland and scattered trees, while on passage and in winter it also frequents mangroves, mixed peatswamp-forest, beach vegetation, casuarinas, plantations, open country and even towns. Its relative, the Long-tailed Minivet, inhabits a wide range of open forest types, including both broadleaf and pine forests, and also occurs, especially in the non-breeding season, in largely deforested areas, groves, wooded cultivation and roadside avenues. The Slender-billed Cicadabird (*Coracina tenuirostris*) occupies a wide range of tropical and temperate forests, but migrants in New Guinea are absent from the forest interior, except on is-



Minivets give simple trilling, twittering or piercing notes when foraging or in flight, and these usually provide the best means of locating flocks. The same calls are sometimes given in a song-like series, but the distinction between a contact function and a sexual or territorial function is rather difficult to draw in campephagids, hampering the use of voice in determining species limits. Throughout most of its range the ***Scarlet Minivet*** *gives a series of whistles, but in the Himalayan form* speciosus *this is replaced with a single lower-pitched upslurred note. More research is needed to clarify the phylogenetic significance of this type of geographical variation.*

[*Pericrocotus flammeus andamanensis*, Andaman Islands. Photo: Otto Pfister]

lands, and prefer instead to keep to forest edges, secondary growth, savanna and mangroves.

The great majority of species occur at low to medium altitudes. Over half of them, approximately 45 species, including the two wattled cuckoo-shrikes and both wood-shrike species, are found from sea-level up to about 1500 m. A few of these primarily lowland campephagids are known to ascend to about 2000 m, but the number of true montane species in the family is small. In the genus *Coracina*, only four resident species are regarded as exclusively birds of montane forest. These are the Black-bellied and Hooded Cuckoo-shrikes of the mountains of New Guinea, where the latter species occasionally reaches 3700 m, the Pygmy Cuckoo-shrike (*Coracina abbotti*) of Sulawesi and McGregor's Cuckoo-shrike (*Coracina mcgregori*) of the Philippines. In the Afrotropics, the forest-dwelling Grey Cuckoo-shrike (*Coracina caesia*) has a very wide altitudinal range, typically occurring above 1000 m in West Africa and at 1500–3000 m in Central and East Africa, but also, exceptionally, near sea-level in Cameroon and Kenya. Farther south, it regularly comes down to sea-level in South Africa. This species is an altitudinal migrant in some parts of its range, descending to lower levels after breeding. Grauer's Cuckoo-shrike (*Coracina graueri*) inhabits African montane and transitional forest, from 1150 m to 1900 m; it is mainly allopatric or parapatric with the Grey Cuckoo-shrike, which typically occurs at higher altitudes.

Two of the four *Campephaga* species also occur typically at higher elevations in Africa. Petit's Cuckoo-shrike inhabits forest mostly at 1000–2000 m, while the wide-ranging and habitat-generalist Black Cuckoo-shrike breeds mainly from 900 m to 2000 m in Central and East Africa, but near sea-level in the Cape, at the southern extreme of the continent. It is a migrant, and in some areas, as with the Grey Cuckoo-shrike, it is present at lower elevations outside the breeding season. In addition, the Purple-throated Cuckoo-shrike (*Campephaga quiscalina*), although mainly a lowland-forest species, occurs in Kenya only at 1500–2500 m.

The minivets include several species that are typically mountain-dwellers. The Grey-chinned Minivet (*Pericrocotus solaris*) is recorded from 600 m to 3050 m, the Long-tailed Minivet at 900–3650 m, rarely to 3965 m, and the Short-billed Minivet and Sunda Minivet (*Pericrocotus miniatus*) up to about 2700 m. The first two of these species are altitudinal migrants, and the Long-tailed Minivet descends as low as 245 m in winter. The Sunda Minivet is apparently sedentary, and it is therefore a true montane-habitat specialist.

Many other migratory campephagids often descend to lower elevations in the non-breeding season, and this behaviour typically occurs among species breeding at high elevations in south Asia. This is enlarged upon later (see Movements).

General Habits

Almost all cuckoo-shrikes are arboreal, and most species in the genera *Coracina*, *Campephaga* and *Lalage* occur singly, in pairs, or in small groups of up to about five individuals that are often family parties. Many members of the Campephagidae, such as the Red-shouldered Cuckoo-shrike, the Western Wattled Cuckoo-shrike (*Lobotos lobatus*) and the Slender-billed Cicadabird, are often difficult to locate, as they are unobtrusive and quite silent as they move around among the foliage. Others, however, although of similar habits, have loud calls that draw attention to their presence. Examples of these are the Mauritius Cuckoo-shrike, which is secretive but may be located by its melodic trill and harsh call note, and the Hooded Cuckoo-shrike, which moves slowly through the trees as a group, calling frequently. Other species betray their presence more readily. This is especially true of the frugivorous ones such as the Golden Cuckoo-shrike, which forages in active and noisy groups, and the Barred Cuckoo-shrike (*Coracina lineata*). The latter occurs not only in small groups, but also in flocks of up to 20, and occasionally up to 40, individuals; it forages actively, while uttering a pleasant chattering call. Depending on the species, trillers may be either active or unobtrusive, but their calls usually draw attention to their presence.

Flycatcher-shrikes and wood-shrikes sometimes occur in small flocks, and are active and not usually difficult to locate. By way of comparison, flocks of minivets, with their bright colours, restless behaviour and musical contact calls, are much more obvious as they flit from tree to tree. Not all minivet species, however, behave in this way. The Rosy Minivet is rather more sluggish, often sitting still on the tops of trees, while the Short-billed Minivet typically lives in pairs, and the White-bellied Minivet is less arboreal and forms only small parties.



The cuckoo-shrikes and their relatives are fundamentally insectivorous, consuming a large amount and broad variety of invertebrate prey. Bulky campephagids, such as the ***Moluccan Cuckoo-shrike****, tend to be fairly ponderous and methodical, searching for arthropods by hopping or walking along trunks and branches, and diligently examining foliage, creepers and vines. They often eat a great many caterpillars, earning them the name "caterpillar-birds" in some regions, but they also catch larger animals, including small vertebrates.*

[*Coracina atriceps magnirostris*, Halmahera, Indonesia. Photo: Morten Strange/ NHPA]



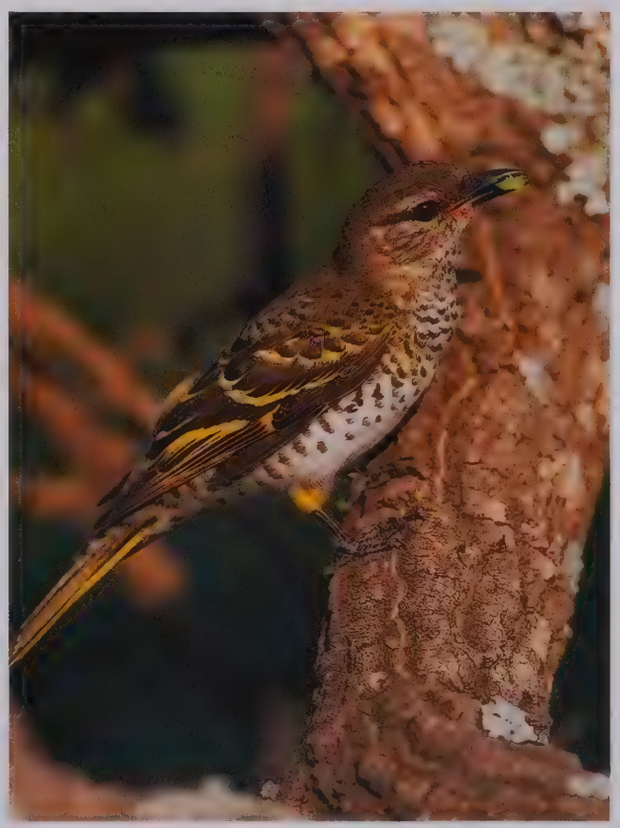
Like other Lalage *species, the* ***White-winged Triller*** *eats a wide variety of insects, including orthopterans, mantids, hymenopterans, bugs and beetles, often dropping down to glean these from the ground. It also visits shrubs and trees to eat fruit, flowers, buds, seeds and nectar, although it is difficult to tell which of these are the real targets here. Most campephagids are relatively solitary, or live in small groups, but some trillers have been noted consorting in flocks of up to 70 in the non-breeding season.*

[*Lalage tricolor*, Mitchell Plateau, Kimberleys, Western Australia. Photo: Jiri Lochman/ Lochman Transparencies]

Flocking behaviour is much more prevalent outside the breeding season, when many species associate in monospecific parties or larger flocks. The White-bellied Cuckoo-shrike, for example, associates in groups of up to twelve or so individuals at this time. More strikingly, the Black-faced Cuckoo-shrike occurs in flocks of 50 or more birds, and Australian migrants of this species in Papua New Guinea are conspicuous and highly gregarious, with roosting flocks of 100 or more recorded in southern areas. Similarly, the White-shouldered and White-winged Trillers form flocks containing up to 70 individuals, while the Large Wood-shrike (*Tephrodornis virgatus*) can be observed in flocks of up to 30 in the non-breeding period.

Throughout the family's range, many campephagids regularly associate with mixed-species foraging flocks in forest or woodland, from low to high altitudes. This behaviour is recorded for members of all genera except the monotypic *Pteropodocys* and *Campochaera*, and is well documented in Asia and Australia, while all the African cuckoo-shrikes, comprising ten species in the genera *Coracina*, *Campephaga* and *Lobotos*, are known to join such flocks. In a New Guinea study, J. M. Diamond found that one type of foraging association, which he termed the "brown and black flock", was distinctive in that member species converged on two alternative colours, rather than on one, and that the flock retained its character through many geographical and altitudinal changes of species composition. The flocks included 35 species and were led by the Rufous Babbler (*Pomatostomus isidorei*) or, in its absence, by one of five pitohui (*Pitohui*) species, all of which have rusty-brown or blackish plumage. Flock-members were predominantly brown, or black to grey. The followers included seven cuckoo-shrikes, at least one species being recorded in many flocks and all seven in at least one flock. All of the cuckoo-shrike species occurring within the altitudinal range of the flocks, 0–1700 m, were represented. They were the Black-shouldered Cicadabird (*Coracina incerta*) and the New Guinea, Barred, Grey-headed (*Coracina schisticeps*), Black-bellied, Stout-billed and Boyer's Cuckoo-shrikes (*Coracina boyeri*).

As well as bearing a superficial resemblance to cuckoos in their plumage and general appearance, the larger cuckoo-shrikes also have an undulating, cuckoo-like flight, in which flapping to gain height is alternated with gliding on stiffly downward-held wings. The flight of some species is rather slow, that of the Stout-billed Cuckoo-shrike appearing somewhat laboured, but the Black-faced Cuckoo-shrike has a vigorous flight with deep wingbeats, and it sometimes glides or dives with the wings closed. Boyer's Cuckoo-shrike has a bouncing, almost hesitant flight, while the Moluccan Cuckoo-shrike executes distinctive, rapid wingbeats. The trillers and the wood-shrikes also have an undulating flight, and in the air trillers look small-headed, with broad, rounded wings. Although the minivets generally have a direct flight, during which the long, graduated tail is often held spread,



In the endemic African genera of Campephaga *and* Lobotos, *insects are the principal food, with lepidopteran larvae forming a large part of the diet of all six species. The urticating species, with poisonous hairs, are usually rubbed vigorously on branches before being consumed. As well as juicy caterpillars, this female* ***Black Cuckoo-shrike*** *is partial to spiders, ants and alate termites, which it hunts at post-rain hatchings. Pairs of cuckoo-shrikes are a common sight in African woodlands, where they spend much of their time following mixed-species flocks of foraging insectivores.*

[*Campephaga flava*, Nylsvley, Limpopo, South Africa. Photo: Warwick Tarboton]



Fruit makes up a large part of the diet in at least 20 Coracina *species, and for some, including the* ***Barred Cuckoo-shrike****, it is the dominant component. This widespread taxon consumes many types of small berries and other fruit, such as* Ficus, Calamus, Terminalia *and* Alphitonia, *gathering in small parties to harvest the abundant food supply at fruiting trees, often alongside other frugivores. In comparison, insects are of minor significance, but prey such as caterpillars and beetles are taken opportunistically.*

[*Coracina lineata lineata*, Kuranda, North Queensland, Australia. Photo: Len Robinson/ FLPA]

the White-bellied and Ashy Minivets fly more in the manner of wagtails, with a few flaps followed by a dipping glide.

When foraging and moving around in trees, many species are quite slow and deliberate in their actions, making long hops and frequent pauses, while some walk and run along branches. Ground Cuckoo-shrikes, aided by their long legs, run freely on the ground, with the head bobbing backwards and forwards like that of a pigeon, and they often leap up to catch insects. When foraging terrestrially, the Black-headed Cuckoo-shrike makes long hops in the manner of a thrush. Some cuckoo-shrikes in the genera *Coracina* and *Campephaga* have a habit of perching motionless on a branch, often in an upright stance and sometimes for long periods; the function of this behaviour is not clear, although it certainly makes the birds very difficult to locate. Many members of the family often alight on an exposed perch, such as a high branch of a dead tree, a telegraph pole, a post or even a wire, and they may sit quietly for some time in such an open situation. Further, some, such as the Cerulean Cuckoo-shrike, call and sing from high, bare branches, and the trillers, too, often perch on exposed branches and utter calls from them. When perched, minivets have an upright posture and frequently flirt the wings and tail. During foraging, they sometimes perch on the tops of trees before flying on.

Some of the larger *Coracina* species have the habit of shuffling or flicking their wings on alighting and when perched, and this action, sometimes described as "nervous-looking", is a recognized field character. The same behaviour is recorded for the Ground Cuckoo-shrike, too. The North Melanesian Cuckoo-shrike also shuffles its wings when foraging, while the Hooded Cuckoo-shrike is said to flick its wings before flying, but not when landing. Among the African species, the Grey Cuckoo-shrike gives occasional flicks of its wings when moving around, while the behaviour is also recorded for the genus *Campephaga*, the Black Cuckoo-shrike often flicking its wings when perched.

A feature peculiar to cuckoo-shrikes is the presence of long, erectile feathers on the lower back and rump (see Morphology). These may be erected during display or when the bird is alarmed. The Black Cuckoo-shrike, for example, when disturbed at the nest, raises these feathers and directs its rounded-looking back towards the source of the danger. A brooding individual will also erect these feathers in the presence of a predator, when the head and tail are depressed and the raised rump feathering makes the bird look like a bump on the branch where the tiny nest is placed. It has also been suggested that these feathers, which have spinescent tips, might deter a small predator that attempted to grab the bird from behind.

All members of the family are territorial when breeding. Members of some resident populations may be territorial throughout the year, even if others of the same species are migratory and exhibit only seasonal territorial behaviour. Agonistic behaviour towards conspecifics and other bird species is well known among

The ***Varied Triller*** *is not much of a socialite: pairs or trios forage surreptitiously in tree canopies, but they rarely associate with other species and are often quite difficult to find. As well as insects, the species eats a great deal of fruit, berries and seeds. By repute, it is particularly attracted to the smaller varieties of figs* (Ficus), *and this photograph does nothing to detract from that theory.*

[*Lalage leucomela rufiventris*, Kakadu National Park, Northern Territory, Australia. Photo: Stuart Miller/ Lochman Transparencies]





Pair-territoriality is the norm for most campephagids during the breeding season, and several resident species appear to defend these territories all year round. This seems to be the case for the ***Madagascar Cuckoo-shrike****, a species that occurs in its namesake island and in the nearby Comoros. Like other* Coracina *species, it builds a small saucer-shaped nest from fine plant fibres, placing this on top of a branch or fork, and decorating the exterior with lichen, moss or pieces of bark, presumably for camouflage.*

[*Coracina cinerea*, Madagascar. Photo: Dominique Halleux/Bios]

breeding campephagids, but it has not been described outside the breeding season. An interesting exception to the general picture is provided by the Ground Cuckoo-shrike. This Australian campephagid is permanently group-territorial and, when the group is foraging on the ground, one individual usually perches in a nearby tree, possibly acting as a lookout.

There is no evidence that any species in the family is anything other than strictly diurnal in its activity. The Black-faced Cuckoo-shrike, for instance, is active from a few minutes after sunrise until about 15 minutes before sunset, and this is probably fairly typical for the family as a whole. Little is known about the roosting behaviour of the Campephagidae. For the few species for which some information is available, roosting takes place singly, in pairs or in small groups in trees, at sunset. In Australia, at least 36 Barred Cuckoo-shrikes were once seen at roost together in a single tree, and migratory species are known to roost in flocks in trees during the non-breeding-season. A flock of Black-faced Cuckoo-shrikes was observed as it circled an area, in almost complete silence, towards dusk; the flock often divided, and individuals alighted in trees before rising and rejoining the flock, which finally settled for the night in the trees.

Very little is known about the comfort activities of members of this family, and allopreening has not been recorded for any of its species. There are, however, several observations of bathing. The Black-faced Cuckoo-shrike bathes in rain, and flutters in wet foliage during rain, while parties of Large Wood-shrikes bathe in the evening in a pool or stream, by swooping down like drongos (Dicruridae) and dipping while on the wing. Sun-bathing is probably widespread in the family, and has been recorded, for example, in the White-winged Triller. This species lies with the body lowered on a horizontal branch, the tail towards the sun, the wings and tail fully spread, and the plumage of the head and upperparts slightly raised. It has also been seen to sun-bathe on the ground, with the feathers fluffed up. During hot weather, temperature regulation is achieved by panting.

Voice

Most cuckoo-shrikes tend to be unobtrusive and quite silent when foraging. Many, however, have loud contact or display calls that are uttered frequently by members of pairs, parties or flocks in flight from tree to tree, and such calls are often characteristic sounds of the forests in which these species occur.

Campephagid songs and territorial calls are simple, often loud and frequently repeated, and, in the case of many species, are apparently given largely or exclusively by the male. Vocalizations consist typically of trills, churrs, chatters, whistles or squawks, some calls being nasal or metallic in quality and others resembling insect sounds. The cicadabirds in the genus *Coracina* are aptly named, as most species have songs reminiscent of the loud mechanical noises produced by the large homopteran bugs known as cicadas (Cicadidae). For example, the Sumba Cicadabird (*Coracina dohertyi*) has a three-note, grating cicada-like song, while the Sulawesi Cicadabird (*Coracina morio*) produces a slow sequence of cicada-like buzzy, nasal, ringing notes alternating with a clear, descending whistle, and the Black-shouldered Cicadabird emits a series of 5–30 disyllabic, buzzing notes. Cicadabirds are generally more secretive than are other *Coracina* cuckoo-shrikes, and their calls are often the best clue to their presence. The Large Cuckoo-shrike is unusual in that its song is a quaint, rarely heard melodious warble, but its calls are loud and screeching and reminiscent of those made by a parrot (Psittacidae). The Hooded Cuckoo-shrike also gives a loud, parrot-like squeal and other harsh, jangling and rasping notes, while the jumbled song of the White-bellied Cuckoo-shrike is said to be suggestive of the sound made by wind chimes.

In the strictly Afrotropical genera, the two wattled cuckoo-shrikes in *Lobotos* are mainly silent and inconspicuous, with "zit" or "tsik" flight calls, while the four *Campephaga* cuckoo-shrikes are also rather silent but have whistling, churring or scratchy warbling songs. The Black Cuckoo-shrike sometimes gives a high-pitched, penetrating, insect-like trill when foraging or in flight.

Elsewhere, the trillers constituting the genus *Lalage* have a variety of calls, including trilling, chattering, chuckling, rattling or rasping notes. Most species have simple songs of repeated musical whistles or piping notes, but the somewhat aberrant Samoan Triller produces a thin, squeaky, ascending or descending trill that sounds as though it has been forced out with great effort. In the breeding season, the male White-winged Triller sings noisily from high perches and in frequent, loud and conspicuous song flights, giving a rapid series of "ditch" or "chur" calls followed



Campephagids often bind their nests together with spiders' webs, or even saliva, and sometimes they work the nest walls over underlying branches for added stability. The ***Varied Triller*** *builds just such a nest, barely large enough to accommodate a single egg. By reducing the structure and its contents to a bare minimum this species presumably succeeds, more often than not, in evading the prying eyes of predators. The eggs of campephagids are variable in colour, but most are off-white or bluish, with a dense pattern of darker blotches or speckles, sometimes gathered in a sort of wreath around the blunt end.*

[*Lalage leucomela leucomela*, near Gympie, south-east Queensland, Australia. Photo: Cyril Webster]

by a canary-like trill. Varied Trillers (*Lalage leucomela*) are noticeably vocal, uttering a loud, rolling, repeated call, and several individuals may call together to produce a widespread chorus. The two flycatcher-shrikes in the genus *Hemipus* and the two wood-shrikes in *Tephrodornis* also have trilling songs.

Minivets have simple, repeated, often trilling or twittering flight calls, or high-pitched, thin whistling or squeaky notes. Their whistling songs are simple, but are often highly variable within a species, and the distinction between songs and calls is sometimes not entirely clear. Flocks of minivets, with their bright colours and soft, musical contact calls, are much more obvious than are many other species in the family.

Duetting of some form or other is known to occur in at least seven species in the family. The song of the Red-shouldered Cuckoo-shrike of Africa is a medley, 5–10 seconds long, of squeaks, churrs and whistles, delivered simultaneously by the male and the female. The Moluccan Cuckoo-shrike has a harsh, staccato chatter, occasionally given by two individuals alternately, while Boyer's Cuckoo-shrike has an antiphonal duet of two or three hard notes followed by a sweet downslurred whistle, sounding like "(tuk)-tuk-tuk see-yu", the short notes given by the female and the whistle by the male. The calls of this species in the Wau area of eastern New Guinea include a different antiphonal duet, the first bird giving a "weeowee" and the second a lower-pitched "wurr". In mainland Papua New Guinea, the Barred Cuckoo-shrike has a plaintive, downslurred, whistling "whee", "whee-uuu" or "seeuu-seeuu-seeuu" which is often given as a duet in flight. Among the trillers, paired Black-browed Trillers (*Lalage atrovirens*) countersing with a sweet "tewhit tewheet wheetu".

It is in New Guinea that the two most dramatic examples of duetting by campephagids are found. The Golden Cuckoo-shrike has a "duet" in which groups of 2–4 individuals are involved. The leader gives a rapid series of about six identical notes, during the last 2–3 of which a second individual utters a whistled upslurred, downslurred or multiple-slurred call. This pattern is repeated continually as the birds chase each other in flight over a tree, or while perched. The group will then fly to another tree, duetting as they go, or with all group-members giving rapidly repeated notes similar to those made by the leader. This performance may be repeated for a long time as the birds move through the forest. A variety of other calls is also given, commonly in a duet. A basic call of the male is a rapid, bubbling, repeated "chirrapa", often with downslurred and upslurred notes added, and the female may make chipping or chuckling notes immediately before the male's call. The second example is that of the Black-bellied Cuckoo-shrike, which has a conspicuous, loud, precisely synchronized antiphonal duet. The male emits an upslurred whistle followed by a downslurred whistle, repeating this call several times; immediately after the beginning of each call, the female utters three or four harsh "kek" notes, completed before the end of the male's slur. The duet is usually carried out by a group of 2–4 individuals, and always while perched. The group flies from tree to tree, making "kek" calls in flight, and duetting each time the birds land. A group may use the same duetting trees and follow a prescribed route each day; one group followed a circular route of about 30 m in radius, returning to the same tree after half an hour.

The behaviour of the Grey-headed Cuckoo-shrike makes an interesting comparison with that of the Black-bellied Cuckoo-shrike. Both occur in the same forests of New Guinea, but are separated by altitude, the Grey-headed occurring at lower elevations. The display and song of the Grey-headed Cuckoo-shrike are very similar to those of the Black-bellied, except that there is no duetting. The perched male makes slurring notes, at the end of which several birds join in with rapid "chuk" calls, which they continue as they fly to the next tree. Bearing in mind the existence of other pairs of similar species separated by altitude in New Guinea, it has been suggested that such pairs originate when one population of a polytypic species, or one of a superspecies group, reinvades the range of a related population that has developed a different elevational preference during geographical isolation. The altitudinally separated members of such species pairs are often similar morphologically but have very different songs, suggesting that voice plays an important role in the isolating mechanisms. Thus, in addition to plumage differences, the synchronized duet of the Black-bellied Cuckoo-shrike, which could readily have evolved from a song resembling that of the Grey-headed Cuckoo-shrike, may function as an isolating mechanism between the two species.

A number of species exhibit marked geographical variation in the pattern and quality of vocalizations. One example among island species is the North Melanesian Cuckoo-shrike: on

Bougainville the call is a squeaky "mee-ahh-ahh", whereas on Guadalcanal it is a harsh, creaking "squeei". In Africa, the song of the Blue Cuckoo-shrike in Gabon is a powerful, downslurred "peeeoo" prefaced by a short "chup", while in Ivory Coast it is more nasal, a mixture of upslurred and downslurred notes. Similar vocal variation is demonstrated by the widespread Slender-billed Cicadabird, which occurs as 30 subspecies ranging from Micronesia, Sulawesi and the Lesser Sundas southwards to Australia and the Solomons. The nominate race, in Australia, has a cicada-like buzzing call, whereas *admiralitatis*, in the Admiralty Islands, gives a repeated, downslurred "seeu" and *monacha*, in the Palau Islands, a quiet, upslurred whistle. As a further example, the song of the Bar-winged Flycatcher-shrike in the Himalayas and South-east Asia includes a short, clear trill, that of the nominate race in the Western Ghats of India incorporates a hard trill, and that of the subspecies *leggei* in Sri Lanka includes a dry, thin, high-pitched trill.

Regional differences in voice are, in some cases, accompanied by significant morphological differences, and this has led to proposals for taxonomic splits. For example, the Scarlet Minivet (*Pericrocotus flammeus*), in most of its large range, utters loud, piercing, repeated whistles as flock contact calls, but the Himalayan subspecies *speciosus*, which is sometimes considered a separate species on the basis of its plumage colour, has a twangy, relatively low-pitched, single upslurred note. Similarly, the Bar-bellied Cuckoo-shrike (*Coracina striata*) has a loud, harsh "klee kleep" flight call in the Philippines, but in the Malay Peninsula and the Greater Sundas the subspecies *sumatrensis* has a clear whinnying "kliu-kliu-kliu" and a sharp "see-up", while the distinctive Andaman Islands race *dobsoni* emits a repeated, ear-splitting, shrieking call. The last-mentioned taxon is sometimes considered to represent a full species.

The calls of young campephagids are very poorly known. Young Black-faced Cuckoo-shrikes produce a begging "cher-reer" call in the nest and a buzzing begging call after leaving it. White-winged Triller chicks utter a peevish husky squeak.

Food and Feeding

Within the family as a whole, the diet consists predominantly of insects and other arthropods, and many campephagids take caterpillars, including hairy ones. The larger species consume relatively large prey, and even, occasionally, small vertebrates. Nevertheless, many species also eat fruit, especially wild figs (*Ficus*), and some are mainly frugivorous, taking insects only infrequently. Several also eat seeds, buds and other vegetable matter.

In keeping with our generally very limited level of knowledge of the family, the diet and food preferences of many of its members are very incompletely documented. Indeed, there is no available information on the food taken by 21 of the 84 species, including 15 of the 50 *Coracina* species. In part, this may be explained by the unobtrusive nature of many of these species, and their preference for foraging in the canopy, which can often make field observation difficult. Not unexpectedly, the most detailed information on food and feeding available is for the campephagids that occur in Africa and Australia.

The majority of cuckoo-shrikes in the genus *Coracina* eat arthropods, this being the principal food type recorded for 28 of the 35 species for which information is available. The four African species, the White-breasted, Grey, Blue and Grauer's Cuckoo-shrikes, are known to feed predominantly on caterpillars, while the Slender-billed Cicadabird of Wallacea, Micronesia and the Australian region is commonly known as the "Caterpillar-catcher" or "Caterpillar-eater", and the Bar-bellied Cuckoo-shrike appears partial to large, hairy caterpillars. The members of this genus often prey on large insects, including mantids (Mantodea), grasshoppers (Orthoptera), dragonflies (Odonata), large beetles (Coleoptera) and bugs (Hemiptera), cockroaches (Blattodea) and stick-insects (Phasmatidae). Other insects preyed upon include ants and wasps (Hymenoptera), termite alates (Isoptera) and flies (Diptera). Spiders (Arachnida), earthworms (Annelida) and snails (Gastropoda) make up the remainder of the invertebrate part of the diet. Large *Coracina* species, such as the Slaty Cuckoo-shrike of the Sulawesi region, the Black-faced Cuckoo-shrike of Australia and New Guinea, and the Hooded Cuckoo-shrike of New Guinea, are known to take small invertebrates such as lizards and, possibly, frogs, while the Mauritius Cuckoo-shrike preys on geckos of the genus *Phelsuma*.

At least 20 *Coracina* species eat fruit. This consists mainly of figs, but also comprises berries of such plants as *Lantana*, *Olea*, *Erxocarpus*, *Lycium*, *Terminalia*, *Calamus*, *Alphitonia* and mistletoe (Loranthaceae). Seeds, including those of the genera *Acacia*, *Cassia* and *Enchylaena*, are also recorded. The Barred,



In some genera, especially Campephaga *and* Pericrocotus, *nests are built by the female. Although she receives no direct assistance, she is often closely accompanied by the male, who seems to follow her permanently during the fertile period, presumably to guard against the loss of paternity to extra-pair males. Once the last egg has been laid, females begin to incubate, and males are free to make a more active contribution. They watch for predators in the vicinity of the nest, and occasionally bring food items to the female, as shown by this* ***Black Cuckoo-shrike****.*

[*Campephaga flava*, Nylstroom, Limpopo, South Africa.
Photo: R.P.B. Erasmus/ Photo Access]



*The best-documented instance of co-operative breeding in the family involves the **Ground Cuckoo-shrike**, a species that permanently lives in groups. These tend to contain a dominant pair and their subordinate helpers, apparently always the young from the previous season, if these have failed to encounter alternative breeding opportunities. It is not known whether helpers assist with incubation, but they do feed, brood and shade the nestlings, as well as chase conspecifics from the territory. On the rare occasions that two adult females have been present in a group, these either laid eggs in the same nest or built nests side-by-side.*

[*Pteropodocys maxima*, Australia. Photo: E. McNamara/ Ardea]

Boyer's, Grey-headed and Black-bellied Cuckoo-shrikes are largely frugivorous, with a diet made up mainly of wild figs. Otherwise, the Slender-billed Cicadabird and the White-bellied Cuckoo-shrike occasionally take nectar, and a few species sometimes eat plant material, such as leaves.

Insects are the principal food also of the African cuckoo-shrikes of the genera *Campephaga* and *Lobotos*, with lepidopteran larvae forming a large part of the diet of all six species. The food of the trillers is relatively poorly documented, and no data are available for five of the ten species. This genus appears to be largely insectivorous, although some species also take some fruit, mostly in the form of small berries, and some seeds, but the Black-browed Triller may be almost entirely frugivorous, as is the Varied Triller, at least in Australia. The White-winged Triller of Australia and New Guinea, although often known as a "caterpillar-eater", has a very diverse insect diet, which includes bees (Apidae) and ichneumons (Ichneumonidae), among others. It is known also to take fruit, seeds and nectar.

Similarly, the minivets are predominantly insectivorous, feeding chiefly on smaller prey than those taken by members of the other genera in the family. Vegetable matter apparently does not form part of the diet of most minivets, and the visits made by Fiery (*Pericrocotus igneus*) and Scarlet Minivets to fruiting fig trees are reportedly for the purpose of capturing insects attracted to the ripe fruit, and not to eat the fruit itself. The Long-tailed Minivet, however, supplements its diet with acacia buds and some fruit, while the Short-billed Minivet also eats some buds.

Not surprisingly, the flycatcher-shrikes and the wood-shrikes feed for the most part on insects. Finally, in the two monotypic genera, the Ground Cuckoo-shrike eats mainly insects, but takes prey up to the size of a House Sparrow (*Passer domesticus*), and the Golden Cuckoo-shrike, in contrast, feeds primarily on fruit.

From the little information available, it appears that the diets of young campephagids are similar to those of the adults. Thus, insectivorous species such as the Ground Cuckoo-shrike, the Slender-billed Cicadabird and the Black-faced Cuckoo-shrike feed their young on arthropods, consisting mainly of insects, while the frugivorous Barred Cuckoo-shrike provisions its nestlings mainly with fruit, especially figs, supplemented with some insects. Although adult Black Cuckoo-shrikes eat mostly caterpillars, they present their young with other insects, especially katydids (Tettigoniidae). A study of the Mauritius Cuckoo-shrike revealed that the diets of adults and nestlings differ only in the fact that small nestlings less than one week old, because they cannot cope with sizeable prey such as geckos and stick-insects, are not given the largest prey items.

Most of the Campephagidae are arboreal foragers, feeding mainly at levels from the middle to the canopy of trees in forest and woodland, and also in the crowns of isolated trees. The principal exception to this general rule is the Ground Cuckoo-shrike of Australia. This species, the largest in the family, lives in open country and forages mainly on the ground, walking and running to catch its prey, leaping into the air to catch insects, and sometimes sally-hovering above the ground, or above ground vegetation, before settling again. Other members of the family, principally those which occur in more open habitats, including forest edge, secondary growth, plantations, scrub, wooded farmland and gardens, sometimes forage on the ground. Examples in the genus *Coracina* are the Large, White-rumped and Black-faced Cuckoo-shrikes, the last of which often sally-pounces to the ground, and both the White-bellied and the Black-faced Cuckoo-shrikes have even been seen to take food scraps on the ground in school playgrounds. Similarly, the two wood-shrike species and the White-shouldered, White-winged and Polynesian Trillers capture prey on the ground in open habitats, while the White-bellied Minivet, which occurs in dry scrub, grassland, savanna, cultivation and even semi-desert, seeks food in low bushes, in grass and on the ground.

In open forests and woodlands in Australia, the White-bellied Cuckoo-shrike has been found to forage in lower strata during the wet season than those levels exploited in the dry season. The male Mauritius Cuckoo-shrike apparently tends to forage higher in trees than does the female, and it has been suggested that this could be associated with the male's display: males of this species usually sing from near the treetops, whereas females do not sing at all.

Species that forage in trees often move quite slowly and methodically. They glean arthropod prey while hopping or walking along tree trunks and branches; they diligently search foliage, including the undersides of leaves, and creepers and vines; and they hop or fly from branch to branch or from tree to tree. Several other prey-capture methods are also used. These include hawking



*In the **Black-faced Cuckoo-shrike** both adults share the task of building a nest on a horizontal fork, usually 8–20 m above the ground, but sometimes lower. In this the female lays two or three eggs, which are incubated by both sexes until they hatch around three weeks later. The nestlings are provided for, again by both sexes, until they fledge in a further 22–26 days, making the nesting cycle fairly long, despite which three broods are sometimes raised in a single season. Australian populations migrate north after breeding, some reaching New Guinea and Wallacea, a journey necessitating strong wings and long primaries.*

[*Coracina novaehollandiae melanops*, Woodanilling, Australia. Photo: Stanley Breeden/ DRK]

or sallying from a perch, sometimes an exposed one, sally-pouncing or striking, flutter-chasing, flush-pursuit, leap-snatching, hover-gleaning, and hovering over bushes or grass before dropping down on to prey items. The Reunion Cuckoo-shrike also probes bark and lichens, as does the Large Wood-shrike, which also takes insects from water surfaces. Frugivorous species, likewise, often move slowly and deliberately through trees while searching for food, although some, such as the Black-bellied and Grey-headed Cuckoo-shrikes, are active and noisy when feeding.

Large prey items are normally swallowed head first, and the largest are often struck repeatedly against a branch before being eaten. Hairy caterpillars are rubbed against a branch before being consumed. The Bar-bellied Cuckoo-shrike, when dealing with large figs, holds the fruit under one foot while picking it apart in order to eat it.

The only information available on foraging and feeding rates is for two species in Australia. During an 80-minute observation period, a male Slender-billed Cicadabird found and ate five insects, each about 30 mm long, which it obtained by gleaning along branches and by sally-hovering. The Black-faced Cuckoo-shrike is also reported as taking long periods, of 10–15 minutes, to obtain food items by gleaning and sally-striking.

All campephagids can occur singly, in pairs or in small groups while foraging, and many are commonly recorded in groups, especially outside the breeding season, when minivets, in particular, often gather in quite large flocks. A good number of species, especially those of forest and woodland habitats, regularly join mixed-species foraging flocks, this behaviour occurring among frugivorous as well as insectivorous species (see General Habits). Such foraging flocks frequently include several campephagid species.

Breeding

Detailed studies of breeding have been made for very few species in the family. Indeed, fairly comprehensive information has being recorded for only twelve species, six from Australia, four from Africa and two globally threatened species of Indian Ocean islands, the Mauritius and Reunion Cuckoo-shrikes. The breeding of some species occurring in India is also fairly well documented. For as many as 39 of the family's 86 species, however, including eight of the twelve *Lalage* trillers and 27 of the 50 *Coracina* cuckoo-shrikes, there is no real information at all on breeding habits. In a very few cases, the months in which breeding occurs or the dates on which nestlings have been found are documented, but no other information is available, and in others only observations of juveniles, or of adults in breeding condition, give some indication of the breeding period.

All species for which relevant information is available are territorial during the breeding season, and some resident species are known, or believed, to be permanently territorial. Monogamy is the rule, and in the case of resident species the pair-bond appears to be strong throughout the year. The single recorded exception to a monogamous mating system is one instance of polygyny, recorded for the White-winged Triller in Australia. In this case, one male and two females occupied a territory; the females used separate nests and each fledged two young, and the male assisted at both nests.

Co-operative breeding has been recorded for several campephagids and may be more widespread in the family than is currently realized. The best-documented example is that of the Ground Cuckoo-shrike of Australia, which normally lives in groups, often containing both adults and young. Helpers appear to be young from the previous season that did not breed at the end of their first year but, instead, help their parents to build the nest and to feed, brood and shade the nestlings. It is not known if helpers assist with incubation, and they do not always assist with brooding, but they do also feed fledglings. Helpers may also chase conspecifics and other bird species away from the nest, or even out of the territory. Occasionally, Ground Cuckoo-shrikes build two nests close together; in one instance, two were placed within 1 m of each other on the same branch, and the nestlings in both were attended by five individuals. Two females occasionally share a single nest, both laying in it, and two nests containing six eggs were each attended by four adults. Co-operative breeding may sometimes occur with the Black-faced Cuckoo-shrike in Australia, as immatures have been observed to attend nests, and an immature was once seen to brood nestlings. In South-east Asia, a pair of Grey-chinned Minivets was assisted by two subadults, possibly its offspring, in tending the nestlings, and co-operative nest-building by the Scarlet Minivet was observed on one occa-





The nest of the ***White-winged Triller*** *is a small, neat saucer built by both sexes. It is made of tiny plant fragments such as dry grass, tendrils and strips of bark, bound with cobwebs and placed on a horizontal or slightly sloping fork of a relatively slender branch, usually 1–12 m above the ground. Both sexes incubate the clutch for around 14 days and feed the brood for a further 12 days, after which the young fledge. One of the most peculiar aspects of breeding behaviour in this species is the fact that it is semi-colonial. Up to seven nests have been counted in a single tree, or 15 in a small clump of trees. Interestingly, these nests are often sited close to those of other black-and-white birds, such as Magpie-larks* (Grallina cyanoleuca) *and Willie-wagtails* (Rhipidura leucophrys).

[*Lalage tricolor*, Manmanning, Western Australia. Photos: Graeme Chapman]



Nestling cuckoo-shrikes are downy and heavily speckled, the latter a feature which helps to camouflage them amongst lichen-encrusted branches, especially when the nest itself is decorated with lichen. In terms of placement and architecture, as well as nestling morphology, campephagid nests bear a striking resemblance to those of certain Neotropical canopy-dwelling cotingas (Cotingidae), no doubt because both families have converged on an optimal predator evasion tactic. If the ploy is successful this brood of ***White-breasted Cuckoo-shrike*** *will fledge around 25 days after hatching, finally reaching independence a full three months later.*

[*Coracina pectoralis*, Marondera, Zimbabwe. Photo: Cyril Laubscher]

sion, when a party of about ten individuals, including apparent immatures, brought material to the nest in turn.

Many campephagids for which information is available appear to breed during or just after the rains, or, in temperate regions, during the summer. Some species in high-rainfall regions, however, tend to avoid the wettest months and may even breed during the dry season. For several members of the family, breeding is recorded in most or all months of the year, and this includes those species inhabiting dry regions with often irregular rainfall, such as those that are widespread in Australia. Thus, the Ground Cuckoo-shrike, which often occurs in dry areas, breeds in all months, but mainly from August to December or January, and after rain in arid regions. Similarly, the Black-faced Cuckoo-shrike breeds in northern Australia from May to December, before and during the summer rains, and in southern Australia from August to January, mainly after the winter rains, but it may nest at any time of the year after good rains, especially in arid regions.

In Africa, the breeding season is normally centred on the rains. The Black Cuckoo-shrike nests mainly during the rains, the White-breasted Cuckoo-shrike mainly from the end of the dry season through the rains, and the Purple-throated Cuckoo-shrike during and at the end of the rains. In New Guinea, Stout-billed and Black-bellied Cuckoo-shrikes probably breed late in the dry season and early in the wet season, while the Fiery Minivet breeds in the December dry season on Palawan, in the Philippines, but in May, at the start of the rains, in Peninsular Malaysia.

Members of the family in the Indian Subcontinent breed primarily during the summer, from March to September, the period varying locally. The Large Cuckoo-shrike, however, is unusual in that, in western India, it apparently has two breeding periods, nesting in February–April and also in August–October.

Courtship chases and pre-copulatory displays have been described for a number of species. The male White-winged Triller, for example, pursues the female through the trees, singing constantly and with a buoyant, floating flight. Paired Black Cuckoo-shrikes often move about together in the breeding season, the male following the female closely and performing a fluttering, moth-like flight near her when excited. Some of the larger cuckoo-shrikes have a courtship display in which the male repeatedly lifts each wing alternately, without opening it, calling strongly while doing so. This same behaviour has been recorded for the Large Cuckoo-shrike in India, which also indulges in courtship chases while uttering its shrill, screaming calls. In New Guinea, the White-bellied Cuckoo-shrike performs a pre-copulatory display in which the male and female, facing each other on a perch, repeatedly raise and lower their wings. A different kind of display is demonstrated by the Slender-billed Cicadabird, in which the male jumps towards the crouching female, with his tail fanned and wings partly spread, and bows towards her with his neck extended. A similar bowing display is given by the Barred Cuckoo-shrike, while the male Varied Triller hops about and bows to the female with jerky movements, calling constantly, immediately before copulation.

Some minivets have impressive courtship-flights and displays, soaring up and then spiralling downwards on outstretched wings to perch on the top of a tree. A female Scarlet Minivet was seen to fly high into the air, pursued by the male, which seized her tail tip in his bill, whereupon both spiralled down, the male releasing the female before perching again; the procedure was then repeated. In another observation, a male Grey-chinned Minivet, holding a white flower in his bill, approached a female; he tilted his head from side to side, swinging the flower, and presented it by touching the female's bill before dropping it. Copulation followed immediately.

Although the majority of campephagids are solitary nesters, the White-winged Triller often nests colonially, with up to seven nests in one tree or 15 pairs in the same clump of trees. This species often nests close to other black-and-white birds, such as Magpie-larks (*Grallina cyanoleuca*) and Willie-wagtails (*Rhipidura leucophrys*). Colonial nesters each maintain a small individual territory, the size of which has not been described. Hardly any information is available on the size of breeding territories, but the Reunion Cuckoo-shrike holds territories of 6–8 ha, while the territory size of the Black-faced Cuckoo-shrike is at least 10 ha. The highest breeding density recorded for the Mauritius Cuckoo-shrike is 25 territories per square kilometre.

All members of the family nest in trees, and many build in tall forest trees high above the ground. Heights of 10–20 m are common, although some species, including the wood-shrikes, nest lower than this. The maximum recorded height, involving a nest of the Black-winged Flycatcher-shrike, is 40 m above the ground. The White-bellied Minivet, because of its occurrence in arid areas with scrub and low vegetation, utilizes small trees and shrubs, nesting only 1–2 m above the ground. All species usually place the nest on a horizontal fork or branch, or sometimes on a slop-

ing branch, and often near the end of the branch and not among foliage. The nest is difficult to see from below.

Both sexes may look for a suitable nest-site, searching either separately or together. Studies of the White-winged Triller have revealed that the finder of a suitable site settles there, and its mate approaches, hops closely around its partner, and takes its place when its mate moves off. Nest-building normally starts within 2–4 days at the selected site. A pair of Ground Cuckoo-shrikes can occupy the same area for many years, and nest in the same tree year after year. Some species may occasionally build inside old nests of other birds. The Ground Cuckoo-shrike, for example, occasionally builds in old nests of Magpie-larks, White-winged Choughs (*Corcorax melanorhamphos*) or Apostlebirds (*Struthidea cinerea*).

All campephagids build very small, inconspicuous, saucer-shaped or cup-shaped nests, sometimes only just big enough to contain the eggs. Materials used include fine twigs, roots, bark, grasses, casuarina needles, lichens, moss, vine tendrils, plant down, wool and horsehair. Most species bind the materials together and anchor the nest to the branch with spider webs, and some apparently use saliva to bind the materials of the sides and rim. Nests are usually lined with soft vegetation, including fine fibres, fine grass, rootlets, moss, hairs, leaves and feathers, but those of some of the large *Coracina* species are left unlined. Many species camouflage the nest by adding pieces of lichen, moss or bark to the outside. Sometimes, as is the case with, for example, the Varied Triller, the outer portion of the nest is worked over the branch on which it is placed. Minivets, the smallest members of the family, tend to build comparatively bulky nests.

In many species, both sexes share in the task of nest-building. In some cases, particularly with species in the genera *Campephaga* and *Pericrocotus*, the female usually builds, while the male accompanies her but does not undertake any of the work. Both sexes of the Barred Cuckoo-shrike collect material, but only one of the two may build, while the male of a pair of Black-winged Flycatcher-shrikes brought materials while the female shaped the nest. The work of nest-building can take time: the female White-breasted Cuckoo-shrike requires about six days and the female Black Cuckoo-shrike up to ten days to complete the nest.

Campephagid eggs are normally oval to elongated oval in shape, but sometimes more rounded, and are smooth and, often, glossy. The ground colour varies from white, as in some minivets and the wood-shrikes, through olive, pale green, pale blue-green or pale blue-grey, as in some *Coracina* species, flycatcher-shrikes and trillers, to olive-green, yellow-olive, darker green or blue-green, as in *Campephaga* and some *Coracina* species. The eggs of almost all species are spotted or blotched, and sometimes also streaked or squiggled, with brown, which varies from pale brown to deep red-brown, purple-brown or even blackish brown, and often have undermarkings of grey, lilac or violet. Those of some species have the markings concentrated in a zone or, more rarely, a ring at the blunt end.

The clutch is of 1–5 eggs, two or three being the commonest number. The minivets and the wood-shrikes lay the largest clutches, often consisting of three or four eggs, and the Ashy Minivet sometimes lays five eggs. In contrast, several species in the genera *Coracina* and *Lalage* regularly lay only a single egg. The laying interval has been recorded for very few species: for the Mauritius Cuckoo-shrike it is one day, for the White-winged Triller it is two days, occasionally shorter, and for the Black-faced Cuckoo-shrike it can be more than 24 hours. Some species are known to re-lay after the loss of eggs or young.

Incubation is undertaken solely by the females of some species, but the duty is shared by both sexes of others. The incubation period is often protracted, varying from 14 days in the White-winged Triller to 21–27 days in members of the genus *Coracina*. In many cases, the sitting female is fed by the male, which also defends the area near the nest. From the very little information available, it appears that incubation commences when the last egg is laid and that hatching is usually synchronous. The chicks are altricial and nidicolous. On hatching, they are blind and naked, but they develop whitish or greyish down within about four days. This down, together with the often dull-coloured skin, renders the young camouflaged on the small nest, placed, as it is, among greyish or grey-brown branches. The chicks of the Bar-winged Flycatcher-shrike, for example, have grey down, sit in rigid stillness with the beak pointing vertically upwards, and are almost invisible to intruders. The nestlings of the similarly camouflaged Large Wood-shrike behave in a similar manner.

Generally, both sexes feed and brood the young, and remove from the nest, or swallow, their faecal sacs. With a few species, however, only the female cares for the chicks, and sometimes



Not surprisingly, adult campephagids feed their nestlings large quantities of soft-bodied insects, a perfect diet for growth and development. In the ***Black-faced Cuckoo-shrike*** *the proportion of fruit and invertebrates in the diet of young birds is not thought to differ from that of adults. In other words, adult birds select the same types of prey for their brood as they do for themselves, although very young hatchlings must be fed relatively small items. It also seems likely that the frugivorous species in* Coracina *might switch to a more insect-based diet in the nestling phase, but this remains to be investigated.*

[*Coracina novaehollandiae*, near Gympie, south-east Queensland, Australia. Photo: Cyril Webster]



*The largest clutches known in the family are laid by the **Ashy Minivet**. This nest contains a brood of three chicks, but clutches of up to five eggs are not uncommon. This fact makes sense in the light of its breeding distribution, which extends into north China and Siberia as far as 52°N. As can be seen from this example, minivet nests are typical in design, but large in relation to body size. Most are built by the female alone, but in at least one group-living species the whole group was seen to collaborate in the construction phase. This suggests that some type of co-operative breeding occurs, but nothing else is known.*

[*Pericrocotus divaricatus divaricatus*, Ussuriland, Russian Far East. Photo: Yuri Shibnev]

only the female broods the young but both parents feed them. The adults also shade the nestlings from the sun and may cover them during rain. Fledging periods are documented for very few campephagids but, as with incubation periods, are generally long, lasting between 20 and 30 days, the longest recorded period being for the White-breasted Cuckoo-shrike of Africa. At the opposite extreme, the White-winged Triller, as well as having the shortest incubation period, of 14 days, has the shortest fledging period, the duration of which is just 12–14 days. Observations made on White-bellied Cuckoo-shrikes have revealed that the adults of this species, in order to encourage the youngsters to fly, push them out of the nest; in one instance, a nest was pulled apart before all the brood had fledged.

Among all species for which information is available, the fledged young remain with the parents for some time after leaving the nest. They may be fed by them for up to two months, and in the case of the White-breasted Cuckoo-shrike for as long as three months. The juveniles often remain with their parents until the next breeding season, at which time they may be driven out of the territory. This is typical with, for example, the Black-faced Cuckoo-shrike. With species that are double-brooded, such as the White-winged Triller in Australia, the male drives away the offspring as the pair begins the second nesting attempt.

Most campephagids rear only one brood in a season. The few for which two broods have been recorded include, in addition to the aforementioned, the Reunion Cuckoo-shrike, the Black-winged Cuckoo-shrike in China, the Pied Triller in Singapore and the Scarlet Minivet in India and Sri Lanka. A further species, the Black-faced Cuckoo-shrike, is capable of raising up to three broods per season.

The age at which campephagids first breed is uncertain, but it is assumed to be one year. Black-faced Cuckoo-shrikes are reported as breeding in immature plumage, when they are presumably less than one year old.

Very few data exist on the breeding success of the members of this family. Hatching success reportedly varies between 49% and 73%, and is highest for the Ground Cuckoo-shrike and the Black-faced Cuckoo-shrike. Fledging success of 27% is reported for the White-winged Triller and of 42% for the White-breasted Cuckoo-shrike. In other studies, the number of young successfully reared per breeding attempt was 0·75 in the case of White-bellied Cuckoo-shrikes and 0·93 in the case of Reunion Cuckoo-shrikes.

Brood parasitism is recorded for campephagids in Australia, where several cuckoo species sometimes lay their eggs in the nests of this family. The White-winged Triller is parasitized by the Pallid Cuckoo (*Cuculus pallidus*), the Brush Cuckoo (*Cacomantis variolosus*), the Fan-tailed Cuckoo (*Cacomantis flabelliformis*) and the Shining Bronze-cuckoo (*Chrysococcyx lucidus*); the Slender-billed Cicadabird is parasitized by the Pallid Cuckoo; and the Black-faced Cuckoo-shrike falls victim to the Common Koel (*Eudynamys scolopacea*) and the Pallid Cuckoo. There is no evidence that any African cuckoo-shrike suffers brood parasitism.

Movements

In view of the largely tropical and subtropical distribution of the family, and the relatively small proportion of species living in regions and habitats where environmental conditions vary markedly by season, it is not surprising that movements are recorded for only a minority of the 86 species. Nevertheless, the Campephagidae do provide examples of all the major types of movement strategy, including regular seasonal latitudinal migration, seasonal altitudinal migration, nomadic and irregular movements, and seasonal dispersive movements. Although many species are poorly known, sufficient information is available to give a good indication of movement patterns in the family.

Of the 60 species for which no movements are recorded, 53 occur exclusively or principally in forest habitats, which are relatively stable, and a further six inhabit both forest and woodland. The only sedentary species that occupies a wide range of generalized habitats, in addition to forest and woodland, is the White-throated Triller. This is one of 52 sedentary species, all largely forest-dwelling, that occur on islands in the Indian Ocean and the western Pacific, this total including those occupying large islands such as New Guinea and Madagascar. In fact, there is no evidence that significant movements are made by any of the campephagids on islands in these regions. Furthermore, of the 26 species which do undertake movements, four, the White-bel-



In most campephagids females tend to shelter the chicks for the first few days after hatching, but this ***Black Cuckoo-shrike*** *seems to be taking her brooding duties too seriously. In this species, both sexes feed the young for 20–23 days, apparently bringing them relatively few caterpillars in comparison with the adult diet, and rather more orthopterans, though this is based on scant evidence.*

[*Campephaga flava*, Stone Hills, Matobo, Zimbabwe. Photo: Richard Peek]

lied Cuckoo-shrike, the Slender-billed Cicadabird, the Barred Cuckoo-shrike and the Varied Triller, have island populations in this region. Their global distributions extend from Wallacea to New Guinea, Melanesia and Australia and, in the case of the Slender-billed Cicadabird, to Micronesia, but, for each of the four, it is only the populations breeding in mainland Australia that exhibit movements.

Significant movements are evident only in continental populations of campephagids, and the longest and most marked are made by those species, especially the minivets, that breed in the more temperate areas of southern and eastern Asia, such as the Himalayas, China and Russia. These movements fall into two principal categories: latitudinal and altitudinal. Seven minivet species undertake regular movements, and three of these make long migrations. The nominate race of the Ashy Minivet breeds in south-eastern Siberia, north-eastern and eastern China, Japan and Korea, and migrates south to South-east Asia and Peninsular Malaysia, the Philippines and the Greater Sundas, while Swinhoe's Minivet breeds in China and spends the winter months in South-east Asia and the Malay Peninsula. The Rosy Minivet is a resident and partial migrant, breeding from northern Pakistan eastwards through Nepal to southern China, and wintering south to central India and continental South-east Asia. The four other migratory minivet species, the Grey-chinned, Scarlet, Short-billed and Long-tailed Minivets, have resident populations and also migratory Himalayan populations, the latter descending to lower elevations after breeding.

There are five other migratory mainland Asian species, but only two of them are long-distance migrants. The Black-winged Cuckoo-shrike makes latitudinal and altitudinal movements, with Himalayan populations wintering in northern India and Chinese populations moving as far south as Indochina and the Malay Peninsula. Northern populations of the Black-headed Cuckoo-shrike, breeding in Nepal and northern India, winter at lower elevations and also farther south, some reaching Myanmar. The other three species, the Large Cuckoo-shrike, the Bar-winged Flycatcher-shrike and the Large Wood-shrike, make seasonal movements to lower elevations in the Himalayan parts of their ranges. The Large Cuckoo-shrike, which occupies a wide range of habitats, is also locally nomadic.

The most detailed information on movements comes from Africa and Australia. In Africa, four species exhibit regular migration. The widespread Black Cuckoo-shrike, of predominantly woodland habitats, has complex and incompletely understood movements, being variously resident, nomadic and migratory. In southern Africa, it breeds in plateau country during the rains and then moves down to lower altitudes; such movements are apparently influenced by rainfall, fewer birds moving away from the breeding areas in wet years. Many individuals in other regions fly north to the equator after breeding, and this species is mainly a non-breeding visitor to East African countries. In addition, it occurs in southern coastal regions throughout the year. Some West African populations of the forest-dwelling Red-shouldered Cuckoo-shrike migrate northwards to breed during the rains, and return to the edge of the forest belt in lower latitudes in the dry season, but elsewhere the species is largely sedentary or nomadic. The White-breasted Cuckoo-shrike is for the most part a resident inhabitant of woodland and savanna, but in some areas it makes seasonal shifts, either to lower elevations or to drier areas. Similarly, the Grey Cuckoo-shrike is largely resident in forest, but some of its populations make altitudinal movements.

In Australia, where in many regions rainfall is irregular or shows great seasonal variation, members of the family exhibit several types of movement. The Ground Cuckoo-shrike is considered resident in some areas, but in others it is regarded as nomadic, with movements that sometimes show no definite general pattern, apparently not being influenced by local rainfall or temperature. In some areas, however, its presence appears to be related to drought, bush fires and the availability of food, and some seasonal occurrences are noted, individuals usually being classed as irregular and uncommon non-breeding visitors. Tasmanian populations of the Black-faced Cuckoo-shrike spend the austral winter in mainland Australia, while those breeding in eastern Australia migrate to the northern parts of the country and to New Guinea, and in smaller numbers westwards to parts of Wallacea. The White-bellied Cuckoo-shrike, on the other hand, is mainly resident, but it apparently shows some seasonal movements and is locally nomadic during the dry winter season, when it occurs uncommonly on islands in the Torres Strait. Finally, the Slender-billed Cicadabird and the White-winged Triller fly south to breed,



*The nest of the **Varied Triller** is designed to hold a single egg, but is no match for a growing nestling. Only mid-way through the nestling period this young bird has burst through the rim of the tiny nest, and will soon have to cling onto the branch to prevent itself from tumbling to the ground. The inadequacy of the nest structure as a housing for young birds is presumably even more pronounced in the case of brood parasitism. Trillers are known to be parasitized by Shining Bronze-cuckoos* (Chrysococcyx lucidus), *which are hardly larger than the host, as well as by Brush* (Cacomantis variolosus) *and Fan-tailed Cuckoos* (Cacomantis flabelliformis), *which are slightly larger. Largest of all is the Pallid Cuckoo* (Cuculus pallidus), *a species that must almost certainly flatten triller nests within a day or two of hatching.*

[*Lalage leucomela leucomela*, near Gympie, south-east Queensland, Australia. Photo: Cyril Webster]



*The nestlings of this **Pied Triller** are almost ready to fledge, but they persist in clinging to the vicinity of the nest-site. They have long since outgrown the nest itself, which has collapsed, and hangs in tatters from its original location. In these last days before fledging the provisioning rate is at its peak, both in terms of rate of visits and the size of items brought by the parents. This species is the only member of* Lalage *to have reached continental Asia, this being an Australasian genus in terms of evolutionary history.*

[*Lalage nigra striga*, Kranki Dam, Singapore. Photo: Jimmy Chew]

after which they head northwards, some reaching New Guinea. The triller also appears irregularly in many of the more arid districts of Australia, depending on the rains, and can be common in desert areas in wet seasons.

The only information on dispersal derives from studies of the Reunion Cuckoo-shrike. Seasonal occurrences of this species in atypical heath habitat are attributed to post-breeding dispersal.

Few data are available on the migratory behaviour of these campephagids. Some migrate at night, as is evidenced by kills recorded at lighthouses in Australia (see Status and Conservation) and by records of migrating Black Cuckoo-shrikes being attracted to lights at night in Kenya, in East Africa. In south-east Russia, however, the Ashy Minivet is known to migrate during the day, when passage is readily detectable because the flocks call in flight. This species is said to make post-breeding movements in flocks, but spring movements in small parties or singly. The Black-faced Cuckoo-shrike collects in large flocks in Australia before it moves north, apparently in a broad front across the Coral Sea, to New Guinea. Migration has been observed throughout the day, and the birds readily cross large expanses of water, flying about 10–12 m above the surface, either with or against the wind. Still in Australia, it has been noted that the sexes of the Slender-billed Cicadabird may migrate separately, the males apparently leaving before the females, juveniles or immatures, and also returning first in the spring. Likewise, the White-winged Triller migrates in flocks, containing up to 60 or so individuals, and the sexes appear to travel separately, the males arriving and departing first. This species, too, can cross large stretches of water, and vagrants have occurred in Tasmania and even New Zealand, although such long-distance movements are, at least sometimes, ship-assisted.

Relationship with Man

Although some members of the family, especially the minivets, are brightly coloured, and despite the fact that these and many other species are quite vocal, the family apparently has no cultural significance in human affairs. Because they are mainly forest-dwellers, usually foraging at treetop level, and are unobtrusive in nature, most campephagids do not come into frequent contact with humans and are easily overlooked.

The majority of the species do not occur in large flocks, and there is no evidence that any one of them has any significance in an agricultural context. The frugivorous species feed mainly on figs and do not forage in numbers large enough to cause damage to commercial crops. Moreover, the diet of the insectivores could be considered to render these species, on balance, beneficial in areas where they forage in plantations and agricultural land.

As may perhaps be expected, the cuckoo-shrikes, minivets and allies are apparently not hunted or trapped to any major extent. In the nineteenth century, it was recorded that, in India, the flesh of the Large Cuckoo-shrike was "eaten and esteemed by some of the natives". This seems, however, to be something of an exception for, so far as is known, campephagids do not feature among the birds prized for the quality of their flesh.

Probably the most important association between this family and humans relates to the interest that they arouse among ornithologists. Minivets, for example, with their brightly coloured plumages, provide a regular delight for birdwatchers visiting the southern and south-eastern parts of Asia.

Status and Conservation

Thirteen species in the family are of conservation concern, but only four of these are currently considered to be globally threatened.

The Reunion Cuckoo-shrike is the only campephagid classified as Endangered, by virtue of its very restricted island distribution and its extremely small population. It is confined to the island of Reunion, in the western Indian Ocean, where the number of mature individuals was estimated at 240 in 1991, at which time it was suggested that the population had been stable since 1974. In 2000, this species was found to occupy a very small range of 16 km², made up of two areas of increasingly degraded forest habitat, in the north-west of the island, and its breeding population was estimated at 60–160 pairs. Its current habitat comprises closed mixed evergreen subtropical forest, often with areas of the heath *Philippia montana* and tamarin (*Acacia heterophylla*), at elevations of up to 1850 m; records in the heath are attributed to post-breeding dispersal.

This species seems unable to colonize new areas, and it is suggested that poor breeding success or poor survival, coupled



*The **New Caledonian Cuckoo-shrike** is endemic to the South Pacific island of New Caledonia, a fact that ensures its permanent treatment as a restricted-range species. It remains widespread in humid forest patches, several of which receive some form of protection, and is therefore not thought to face any immediate risk of extinction. Of all the New Caledonian endemic birds that are not classified as threatened, however, it is perhaps the most uncommon. Its status and distribution should be monitored, and the protected-area network serving New Caledonia's unique avifauna should be expanded wherever possible.*

[*Coracina analis*, Rivière Bleue Reserve, New Caledonia. Photo: Joe Tobias]

with population fragmentation, may prevent it from spreading. Further habitat loss, as a result of degradation by the invasion of exotic vegetation, for example, could therefore have devastating consequences. Other threats to its habitat include tree-felling, agriculture, development for tourism and recreation, and damage by introduced deer. Poaching and hunting, and the predation of nests by cats and rats (*Rattus*), may be major problems. The very small population is at risk also from catastrophic events such as cyclones and extensive fires, which occur regularly on Reunion.

The Reunion Cuckoo-shrike's narrow habitat tolerance, its inability to colonize other areas of similar forest, and its rather low population density are unusual characteristics in an island endemic. Such bird species typically attain a high density and occupy a relatively broad habitat niche, as apparently do all other native forest birds on Reunion. Heavy deforestation since the seventeenth century has led to contraction and fragmentation of the cuckoo-shrike's formerly widespread range on the island, and the surviving population may be forced to subsist in suboptimal habitat in the last remaining extensive forest patches at higher altitudes. Its former distribution was centred on lower elevations, where natural forest has now almost disappeared.

In 1999, the 38-km² Roche Ecrite Reserve, which encompasses most of the species' range, was being established, and plans for habitat management were being formulated. These include a logging ban, control of exotic plants, the establishment of firebreaks, better control of hunting, the curbing of tourism, and action to reduce deer numbers. An experimental translocation of Reunion Cuckoo-shrikes to a lowland site has also been suggested, with the aim of creating a second population as an insurance against the stochastic extinction risk faced by the species' current small, isolated population.

Of the three Vulnerable species, the Mauritius Cuckoo-shrike is restricted to southern Mauritius, where it has a very small range of about 117 km². Its population in 1993 amounted to no more than about 260 pairs, but it has responded well to the recent rehabilitation of native ecosystems. Its population was estimated at 300–350 pairs in 2000 and is still increasing, and the species has colonized two lowland areas contiguous with its previous range. It is apparently strictly territorial throughout the year, and its distribution in forest seems to be linked to food availability. Habitat loss and degradation, through invasion by exotics and poor regeneration of native plants, remain a long-term threat. There is circumstantial evidence that the use of organochloride pesticides in the 1950s and 1960s also caused a population decline, from which the species seems to have largely recovered. Introduced predators and natural cyclones take a heavy toll on nests, while the introduced Common Myna (*Acridotheres tristis*) may be a food competitor. The Black River Gorges National Park covers most of this cuckoo-shrike's range, and it has benefited from the rehabilitation of habitat in Conservation Management Areas. It is intended to translocate pairs to new areas on Mauritius, and also, eventually, to adjacent islets.

In the Philippines, the White-winged Cuckoo-shrike (*Coracina ostenta*) is also listed as Vulnerable. Like many other



*The **Cerulean Cuckoo-shrike** is another restricted-range campephagid that is not thought to be globally threatened. It is restricted to the Indonesian island of Sulawesi, where it remains generally common and conspicuous in humid forests of the foothill and montane zone. Effective long-term management needs to be ensured for all protected areas embracing this habitat, perhaps especially at Lore Lindu, where a healthy population of this species survives, alongside most of Sulawesi's unique montane fauna.*

[*Coracina temminckii rileyi*, Lore Lindu National Park, Sulawesi. Photo: Bernard Van Elegem]



*One of several trillers restricted to small oceanic islands, the **Polynesian Triller** occurs in a variety of South Pacific archipelagos, including Vanuatu, Fiji, Tonga and Samoa. The total land area of these island groups is very small, however, resulting in its classification as a restricted-range species. Fortunately, it has adapted well to degraded habitats and man-modified environments, such as scrubland, gardens and roadsides, and most of its subspecies are therefore thought to be secure.*

[*Lalage maculosa maculosa*, Samoa. Photo: Roland Seitre]

avian species in the region, it is undergoing a rapid population decline following large-scale destruction of its forest habitat at low to middle altitudes. Its range is small, covering 23,000 km², fragmented and shrinking. It is now restricted to a few localities on the islands of Negros and Panay, both of which have suffered massive forest destruction, and it is almost certainly extinct on Guimaras, the only other island from which it has been recorded, as a result of near-total deforestation. Large trees appear to be an essential requirement of this campephagid, as a consequence of which it suffers heavily from logging; although some records suggest that it can survive in secondary forest, albeit at relatively low densities, small patches of less than 50 ha may be unsuitable. Habitat degradation, particularly the selective logging of large trees, poses a serious threat to this species. It is rarely recorded above 1100 m, and much of the surviving forest within its range lies above this altitudinal limit. Significant populations are unlikely to survive in montane forest, and it occurs at relatively low densities in secondary forest.

The third Vulnerable species, the Western Wattled Cuckoo-shrike of West Africa, is confined to the canopy of primary or tall lowland rainforest and open swamp-forest. It seems able to tolerate some habitat modification, as it is also recorded in logged, disturbed and managed forest, and in Ivory Coast it has been found in *Terminalia ivorensis* plantations; it can breed in mature logged forest. Despite these adaptations, this campephagid must be seriously threatened by massive forest destruction throughout its fragmented range of 300,000 km². It is locally rare to uncommon, and its population may be declining rapidly. Its sole congener, the Eastern Wattled Cuckoo-shrike (*Lobotos oriolinus*) of the more central parts of Africa, is listed as Data-deficient. This poorly known species is uncommon to very rare throughout its potentially wide range, but the reasons for its rarity are unclear. It is not likely to be immediately threatened by habitat loss, as it appears to prefer secondary forest.

Nine members of the family are currently placed in the conservation category of Near-threatened. Seven are confined to islands, and six of these, including one minivet species, occur in Indonesia or the Philippines, where forest destruction has been severe. In Indonesia, the Buru Cuckoo-shrike is restricted to the island of that name. Although apparently uncommon and locally distributed, it is probably little affected by recent habitat changes because it occurs in disturbed areas, and its preferred habitat appears to be higher-altitude forest with an open understorey. The Pied Cuckoo-shrike (*Coracina bicolor*) is confined to islands in Indonesia, where its range is fragmented. Forest destruction within its altitudinal limits has been extensive, and its populations must have declined, but it does, nevertheless, occur in forest with clearings. The Kai Cicadabird (*Coracina dispar*), restricted to the Banda Sea Islands Endemic Bird Area, inhabits forest and secondary woodlands. It appears to be uncommon but, as it is easily overlooked, it is possible that it is locally more numerous. The condition of some of the islands on which this cicadabird occurs is unknown, and an assessment of its true status is therefore very difficult.

In the Philippines, the Black-bibbed Cicadabird (*Coracina mindanensis*) is found on a dozen islands, and three of its five races are considered rare. Most records of this species have been made at elevations well below 1000 m. This apparent preference for lower-altitude forest suggests that it must have suffered population declines with the destruction of lowland forest in the region. McGregor's Cuckoo-shrike is found only on the Philippine island of Mindanao, where it is apparently common in montane forest at 1100–1900 m. Although forest above 1300 m is now seriously threatened by clearance at one locality, habitat at these higher altitudes is generally fairly secure.

The only Near-threatened minivet, the Fiery Minivet, is restricted to the Sundaic lowlands in the southern Malay Peninsula, Indonesia and the south-west Philippines. Forest destruction in these lowlands has been very extensive, but this minivet occurs also on submontane slopes, where forest destruction has been less severe, and in secondary growth, and it is thought not to be immediately threatened. Farther east, the Solomon Cuckoo-shrike (*Coracina holopolia*) is generally scarce, but it remains fairly common, especially in the hills, on Bougainville and Buka. Its ability to survive in logged and degraded forest is poorly known. Lowland forest throughout the region is threatened by logging, and the cuckoo-shrike itself is considered Near-threatened; as a large proportion of the population appears to inhabit hill forest unsuitable for logging, however, its numbers may be declining relatively slowly. The Samoan Triller, confined to the two main Samoan islands, is generally uncommon and probably sedentary. Its survival requires the protection of primary forest on Upolu and Savai'i.

In Central Africa, Grauer's Cuckoo-shrike, the only entirely continental Near-threatened campephagid, is extremely local and uncommon. It has a restricted range in forested highlands of east-



*The **Samoan Triller** is restricted to the Samoan islands of Upolu and Savai'i, where it is generally uncommon and reliant on old-growth native forests for its survival. A combination of gradual habitat degradation, natural cyclones and poorly managed protected areas has raised concern for this species, which is therefore listed as Near-threatened. It is highly aberrant in several respects, being tiny, pale-eyed, sexually monochromatic and virtually patternless, on the basis of which it is sometimes placed in a monospecific genus:* Oscarornis. *Its taxonomic affinities deserve further study.*

[*Lalage sharpei*, Samoa. Photo: Roland Seitre]

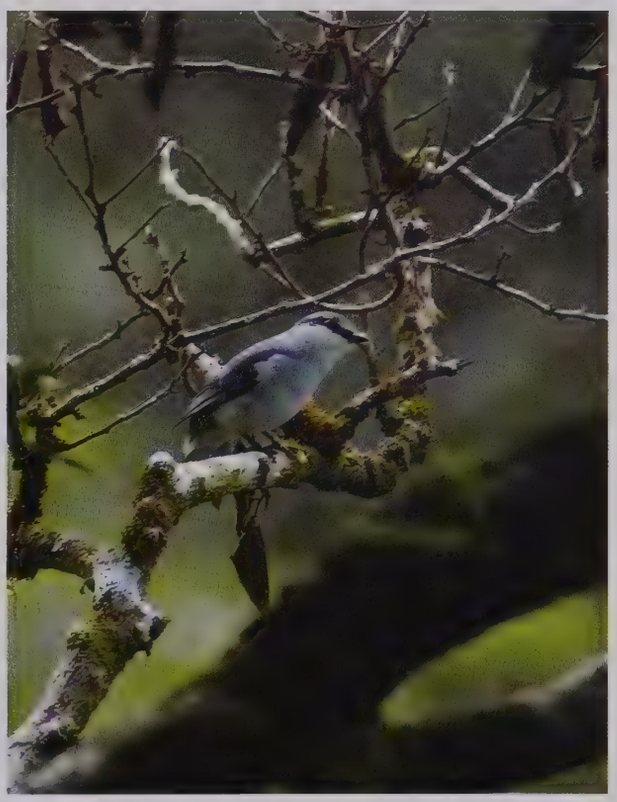
ern DRCongo. Here, it is potentially at risk owing to the effects of forest clearance for slash-and-burn agriculture, and unregulated logging.

Reliable detailed information on the current status of most of the non-threatened species in the family is lacking, but many, especially those that are dependent on primary or mature forest, must have suffered extensive habitat loss. Species having a wider habitat tolerance, allowing them to thrive in modified forest, woodland and more open areas, as well as those which can occupy agricultural and urban habitats, generally appear to be relatively numerous and less vulnerable. Unfortunately, little or no information is available for a few very poorly known single-island endemics, including the Manus Cuckoo-shrike (*Coracina ingens*), the San Cristobal Cicadabird (*Coracina salomonis*) and the St Matthias Triller (*Lalage conjuncta*). The conservation status of the triller should perhaps be reassessed, in view of its very restricted range; confined to the St Matthias Group, in the Bismarck Archipelago, this species should probably be considered Vulnerable, at best.

A few of the Campephagidae have adapted well to modified or degraded habitats. In New Guinea, for example, the White-bellied Cuckoo-shrike is common and has invaded some urban areas, where it is locally abundant. It increased greatly in numbers following forest clearance in the Wau Valley, and it has invaded other highland areas in disturbed habitats. In Australia, it is similarly abundant in urban areas of the tropics. In contrast, the Ground Cuckoo-shrike, found only in Australia, is generally uncommon, and has declined in some places, possibly as a result of shrubland clearance. It may have benefited elsewhere, however, from the clearing of dense vegetation for agriculture, enabling it to extend into previously unsuitable areas.

In the Afrotropics, the four *Campephaga* and the four *Coracina* species are generally regarded as uncommon to locally common, but they must have suffered to some extent from habitat loss, and most of the forest-inhabiting species have fragmented distributions. It seems certain that the White-breasted Cuckoo-shrike, which inhabits mature woodland, has been adversely affected throughout its range by woodland clearance, especially for agriculture and charcoal production. The Grey Cuckoo-shrike, a widespread forest bird, is an altitudinal migrant and is thus able to tolerate a range of habitats. In consequence, if its breeding habitat is destroyed, it may have a better chance of natural relocation than would a sedentary forest species, while it may have benefited locally from increases in secondary forest and forest-edge habitats, and it also tolerates the presence of humans and occurs in gardens. The poorly known Petit's Cuckoo-shrike is considered uncommon to locally frequent. Although its numbers must surely have been reduced by forest destruction, it is known to survive in logged forest in Uganda.

The Madagascar Cuckoo-shrike (*Coracina cinerea*) is reasonably common in suitable habitat in Madagascar, but is uncommon in the Comoros. It is presumably at some degree of risk as a result of forest destruction, but few data are available.



*In 1993 the global population of the **Mauritius Cuckoo-shrike** amounted to a mere 260 pairs, but recent conservation action, involving the rehabilitation of native ecosystems on Mauritius, had already resulted in an increase to 300–350 pairs by 2000. Its numbers and range are still expanding, but it remains threatened by habitat loss, pollution, and predation by introduced mammals. The continued protection and management of Black River Gorges National Park, which covers most of the natural range of this species, would appear to be of critical importance.*

[*Coracina typica*, Mauritius. Photo: Roland Seitre]



*The only officially Endangered campephagid is the **Reunion Cuckoo-shrike**, a species confined to the Indian Ocean island of Reunion, where 60–160 pairs were estimated to survive in 2000 in a very small range (16 km²). It lives in mixed evergreen subtropical forest in the north-west of the island, often ranging into areas of low-stature heath, but it seems unable to expand its distribution or population despite ongoing conservation efforts. It is to be hoped that the 38-km² La Roche Ecrite Nature Reserve, established largely to conserve this species, will play a major role in ensuring its long-term survival.*

[*Coracina newtoni*, Reunion. Photo: Thomas Ghestemme/SEOR]

In Asia, numbers of the widespread Bar-bellied Cuckoo-shrike have probably been reduced throughout its range by the destruction of lowland forest. This species is apparently still common in the Philippines, but it is only rare to locally fairly common in the Malay Peninsula. Indeed, the subspecies in the latter region, *sumatrensis*, which occurs also, probably as a scarce resident, in Sumatra, is regarded as "Vulnerable", bordering on "Endangered", as a result of habitat destruction. Although the species is able to breed in secondary vegetation and isolated trees, it never occurs far from tall forest. Similarly, the Lesser Cuckoo-shrike is labelled as "Near-threatened" in the Malay Peninsula, again because of loss of its forest habitat. Farther east, on Halmahera, the Rufous-bellied Triller remains moderately common, despite its numbers having almost certainly been reduced by forest destruction. This campephagid's ability to occupy selectively logged forest suggests that it may not have suffered so serious a reduction as have some other species. Its relative, the Varied Triller, is locally common in suburbs and partly cleared country in Australia.

Although the Small Minivet is regarded as "Vulnerable" in the Malay Peninsula, because of a lack of records inland from the mangrove zone, it is still common in many other parts of South-east Asia and is very common in suitable habitat over the Indian Subcontinent. In contrast, the White-bellied Minivet, which was formerly regarded as common in Myanmar, is believed now to be uncommon there, and it is local and uncommon in India and Pakistan. One of the most widespread members of the family, the Scarlet Minivet, is designated as "Near-threatened" in the Malay Peninsula as a result of forest loss and fragmentation, but it appears still to be common elsewhere in South-east Asia, as well as in the Philippines, and from India to southern China.

Finally, one of the two flycatcher-shrikes, the Black-winged Flycatcher-shrike, is another species that is regarded as "Near-threatened" in Peninsular Malaysia. This is due to its relative scarcity on major slopes, and to its generally narrow habitat range.

No campephagid species are known to have become extinct in recent years, but three subspecies have disappeared. The nominate race of the Long-tailed Triller was restricted to Norfolk Island, east of Australia, where it probably occupied all wooded habitats and was common until 1941. Amazingly, however, it has not been seen since the year after that, 1942, and is considered extinct. This sudden and complete disappearance evidently coincides almost exactly with the arrival of black rats (*Rattus rattus*) on the island in the mid–1940s, and predation by the rats was probably the main cause of its extinction. Its disappearance also coincided, however, with the construction of an airport in the centre of the island, which involved the clearing of a large area of remnant native forest. The two other extinct taxa were both endemic on the island of Cebu, in the central Philippines. The subspecies *cebuensis* of the Bar-bellied Cuckoo-shrike was believed extinct in 1959 as a result of widespread deforestation on the island, while the subspecies *altera* of the Blackish Cuckoo-shrike (*Coracina coerulescens*) is considered also to be extinct, for the same reason.

There is no indication that members of this family are subject to significant mortality as a direct result of human actions. They are not hunted for food, nor are they targeted as pest species. With the exception of the globally threatened and extinct taxa mentioned in the preceding paragraphs, none of the species seems to suffer to any major extent from the adverse effects of introduced predators. In Australia, the Black-faced Cuckoo-shrike is occasionally killed by cats, and is sometimes a victim of road traffic. In addition, it sometimes dies as a result of flying into lighthouses while on passage, having been disoriented by the dazzling beams of light. Occasional lighthouse casualties are also reported for other migratory species, such as the Slender-billed Cicadabird and the Barred Cuckoo-shrike, while White-winged and Varied Trillers are very occasionally killed by vehicles.

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PLATE 1


inches 6
cm 15
1
ssp larvata
2
ssp melanocephala
ssp macei
ssp larutensis
ssp siamensis
3
ssp rexpineti
4
5
ssp sumbensis
ssp personata
ssp alfrediana
6
ssp pollens
variants
ssp atriceps
7
ssp magnirostris
8
ssp welchmani
9
ssp amadonis
10
ssp novaehollandiae
11
ssp subpallida

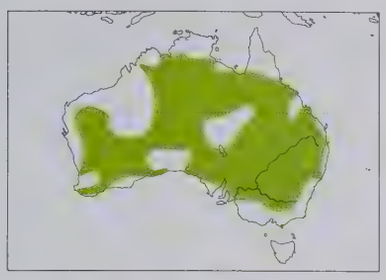
Genus *PTEROPODOCYS* Gould, 1846

1. Ground Cuckoo-shrike

Pteropodocys maxima

French: Échenilleur terrestre **German**: Grundraupenfänger **Spanish**: Oruguero Terrestre
Other common names: Greybird, Caterpillar-catcher

Taxonomy. *Ceblepyris maxima* Rüppell, 1839, New Holland = New South Wales, Australia.
Sometimes placed in genus *Coracina*. N birds have been separated as race *pallida* on basis of slightly paler overall colour, but degree of difference from birds elsewhere in species' range is small (minor Gloger effect). Monotypic.
Distribution. Australia, mainly in interior.



Descriptive notes. 31–38 cm; 124–155 g. Large, slender and long-legged cuckoo-shrike; slightly forked tail unique in family. Has grey head, nape, mantle and breast, darker on ear-coverts and in front of and around eye; back to uppertail-coverts white, narrowly barred black; lesser upperwing-coverts grey, rest of wing black with greenish gloss, outer primaries narrowly edged white; rectrices black with white bases and narrow white tips, outer pair largely white; lower breast and belly white, finely barred black, undertail-coverts, underwing-coverts and axillaries white; iris buffy white; bill and legs dark grey. Easily separated from all other cuckoo-shrikes by striking contrast between grey head and back, black wings and tail, white underparts and lower back with fine dark barring, and whitish eye emphasized by darkish mask. Sexes alike. Juvenile is duller than adult, head to mantle lightly barred dusky, eye dark; immature not properly described, similar to adult. Voice. A loud, repeated "pee-oo" or "queel" delivered in flight; "chill-chill.....kee-lick", harsh "cool-ook" and muffled "woof" given when perched.
Habitat. Inhabits open, usually rather dry, lightly timbered country, including low eucalypt (*Eucalyptus*) woodland, acacia (*Acacia*) scrub and spinifex (*Triodia*), and grassy plains with scattered trees or shrubs; also visits trees along watercourses, as well as claypans, pastures and vineyards. Its preferred habitats tend to have ground cover sparse or absent; often occurs in areas of bare, stony ground.
Food and Feeding. Eats mainly adult and larval insects, including mantids (Mantodea), grasshoppers and locusts (Orthoptera), Phasmatodea, and ants (Hymenoptera); also arachnids. House Sparrow (*Passer domesticus*) also recorded as a prey item. Occasionally takes seeds and leaves. Prey taken on the ground; walks and runs with head jerking back and forth. Also hawks for flying insects from perch on stump or fence post. Usually forages in small groups.
Breeding. Recorded in all months, but mainly Aug–Dec/Jan, and after rains in arid regions. Nests communally; sometimes breeds co-operatively, helpers apparently the pair's young from previous season. Nest variable, from a shallow bowl to a deep cup, made of fine dry twigs, roots, bark and grass bound with cobwebs, loosely lined with soft vegetation, lichens or wool, placed 3–15 m above ground on horizontal branch or fork; occasionally builds on old nest of Magpie-lark (*Grallina cyanoleuca*), White-winged Chough (*Corcorax melanorhamphos*) or Apostlebird (*Struthidea cinerea*). Eggs 2–3, occasionally 4; no information on incubation period; chicks fed and cared for by both parents, often assisted by helpers, fledging period 29 days. Hatching success 67–73%; fledging success 40%.
Movements. Thought to be resident in some areas, and no large-scale seasonal movements apparent. Regarded as nomadic, with some types of movement that show no overall definite pattern. In S Murray Darling region, in SW New South Wales, an irregular visitor, apparently not influenced by local rainfall or temperature; at Coolup, in SW Western Australia, winter flocks occur fairly regularly and some stay for most of year.
Status and Conservation. Not globally threatened. Widespread, but generally regarded as uncommon; rarely found near coasts. Density of 0·5 birds/ha recorded on Nullarbor Plain, in Western Australia, in 1979. Declined in Victoria after human settlement, possibly because of clearing of shrublands. Has apparently extended its range into Queensland since 1935 and 1950, and in some parts of South Australia in 1930s and 1960s. Populations have reportedly declined in Murray–Mallee since mid-1970s.
Bibliography. Beruldsen (1980), Blakers *et al.* (1984), Boehm (1983), Brooker *et al.* (1979), Christidis & Boles (1994), Dickinson & Dekker (2002a), Hall (1974), Higgins *et al.* (2005), Immelmann (1962), Keast (1958), MacDonald (1988), McAllan & Bruce (1988), Morcombe (2000), Pizzey (1980), Schodde & Mason (1999), Serventy & Whittell (1976), Simpson & Day (1994), Slater *et al.* (1989), Trounson & Trounson (1987).

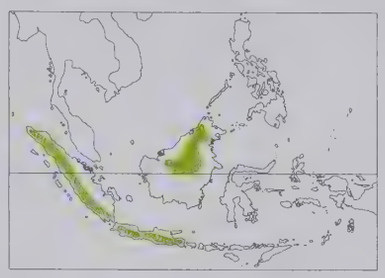
Genus *CORACINA* Vieillot, 1816

2. Sunda Cuckoo-shrike

Coracina larvata

French: Échenilleur de la Sonde **German**: Larvenraupenfänger **Spanish**: Oruguero de la Sonda
Other common names: Black-eared/Black-faced Cuckoo-shrike(!)

Taxonomy. *Ceblepyris larvata* S. Müller, 1843, Java.
Sometimes considered to form a species group with *C. temminckii*, *C. longicauda* and *C. parvula*, and has been treated as conspecific with last. Three subspecies recognized.
Subspecies and Distribution.
C. l. melanocephala (Salvadori, 1879) – Sumatra.
C. l. larvata (S. Müller, 1843) – Java.
C. l. normani (Sharpe, 1887) – Borneo.



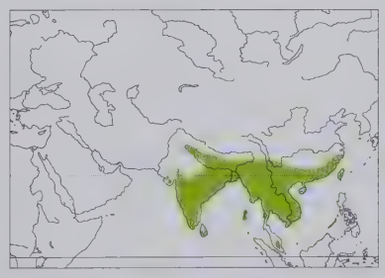
Descriptive notes. 26–27 cm. Male nominate race is dark slaty-grey above, including upperwing-coverts, paler on side of head, dusky lower forehead and lores, slaty-black ear-coverts and feathers around eye; alula black, primary coverts and primaries black, edged slaty grey, secondaries similar but with broader grey edges, tertials slaty grey on outer webs, black on inner webs; rectrices black, tipped pale grey; throat dark grey merging into slaty grey rest of underparts, thighs darker; underwing-coverts and axillaries slaty grey; iris dark brown; bill and legs black. Differs from somewhat similar *C. personata* in having underwing-coverts grey (not white), bill smaller and narrower. Female resembles male, but smaller black mask, underwing-coverts barred grey and white, occasionally some barring on undertail-coverts. Juvenile is like female, but with whitish feather edges; immature also resembles female, but barring on underwing-coverts more pronounced. Race *melanocephala* male has entirely black head, juvenile very similar to adult nominate; adult *normani* has intermediate extent of black on head. Voice. Harsh, ringing whistles, "eeooo-eeooo-eeooo" or "shreeok", and a curious loud, wheezy song.
Habitat. Occupies humid forest, including mossy forest and pine (*Pinus*) forest; highlands, 850–2200 m.
Food and Feeding. Eats insects, including lepidopteran larvae, beetles (Coleoptera), grasshoppers (Orthoptera), crickets (Gryllidae), ants (Hymenoptera) and arachnids; also takes fruit. Forages singly or in pairs in treetops; sometimes joins mixed-species foraging flocks.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. In 1990s, was common in N & W mountain ranges of Sumatra, and in higher ranges in Borneo from Mt Kinabalu S to at least the Mueller Range (Kalimantan), but very local in Java. Occurs in Mount Kinabalu National Park, in Borneo, and Gunung Gede-Pangrango National Park, in Java.
Bibliography. Andrew (1985, 1992), Davison (1992), Hellebrekers & Hoogerwerf (1967), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Ripley (1941), Smythies (1999), Voous & van Marle (1949), Wilkinson, Dutson & Sheldon (1991).

3. Large Cuckoo-shrike

Coracina macei

French: Échenilleur de Macé **German**: Maskenraupenfänger **Spanish**: Oruguero de Macé
Other common names: Black-throated/Indian Cuckoo-shrike

Taxonomy. *Graucalus Macei* Lesson, 1831, Calcutta, India.
Forms a superspecies with *C. javensis*, *C. schistacea*, *C. personata*, *C. atriceps*, *C. fortis*, *C. welchmani*, *C. caledonica* and *C. novaehollandiae*, possibly also including *C. caeruleogrisea*; all were formerly treated as conspecific. All races of present species or, alternatively, only *larutensis* sometimes placed in *C. javensis*; the decision regarding to which of the two species *larutensis* should be assigned is critical to the resolution of relationships of these taxa, and further study needed. Differences in calls and morphology suggest that nominate race and *layardi* may represent a separate species. Eight subspecies provisionally recognized.
Subspecies and Distribution.
C. m. nipalensis (Hodgson, 1836) – Himalayas from Garhwal and W Nepal E to NE India (W Assam).
C. m. macei (Lesson, 1831) – C & S India from Garhwal E to West Bengal and Orissa, S to Travancore.
C. m. layardi (Blyth, 1866) – Sri Lanka (except NW lowlands).
C. m. andamana (Neumann, 1915) – Andaman Is.
C. m. siamensis (Stuart Baker, 1918) – Myanmar, S China (S Guizhou, W, NW & S Yunnan), Thailand (S to Isthmus of Kra) and S Indochina.
C. m. larutensis (Sharpe, 1887) – Peninsular Malaysia (from N Perak S to S Selangor and Pahang).
C. m. rexpineti (Swinhoe, 1863) – SE China (Guangxi, Guangdong, Fujian), Taiwan, N Laos and N Vietnam.
C. m. larvivora (Hartert, 1910) – Hainan I.



Descriptive notes. 23–30 cm. Very large cuckoo-shrike with massive, hooked bill. Male nominate race has upperparts, including upperwing-coverts, grey, paler on rump and uppertail-coverts; frontal line, lores and feathers around eye black, ear-coverts and side of face dark grey; alula black; primary coverts black, edged pale grey; primaries black, edged white; secondaries and tertials black, tipped white, with grey inner webs and white edges; rectrices black, tipped white, central pair grey, outer pair edged grey; chin blackish; cheeks and underparts grey, becoming white with grey bars on belly, white undertail-coverts; axillaries and underwing-coverts white with a few grey bars; iris brown to orange-brown; bill and legs dark brown to black. Female is lighter grey than male on upperparts, lores grey, ear-coverts dark grey, orbital feathering black; feathers from lower back to uppertail-

On following pages: 4. Javan Cuckoo-shrike (*Coracina javensis*); 5. Slaty Cuckoo-shrike (*Coracina schistacea*); 6. Wallacean Cuckoo-shrike (*Coracina personata*); 7. Moluccan Cuckoo-shrike (*Coracina atriceps*); 8. Buru Cuckoo-shrike (*Coracina fortis*); 9. North Melanesian Cuckoo-shrike (*Coracina welchmani*); 10. South Melanesian Cuckoo-shrike (*Coracina caledonica*); 11. Black-faced Cuckoo-shrike (*Coracina novaehollandiae*).

coverts, and greater upperwing-coverts, edged whitish, cheeks and entire underparts white, barred grey to blackish except from lower belly to undertail-coverts; rectrices browner than male's, with smaller white tips. Juvenile is brownish, heavily scaled whitish-buff, more mottled on underparts; immature resembles adult female, but with broader, paler edges on remiges and primary coverts. Races differ in barring of underparts, and in size and overall colour: *nipalensis* is largest and darkest, with very long wing, unbarred below, female weakly barred; *layardi* resembles nominate, but smaller (smallest race), wing short; *andamana* is pale, with reduced black on head, unbarred below, female weakly barred; *siamensis* has underpart barring absent in male, and reduced in female; *larutensis* is similar to previous, but male even darker grey, blacker on primaries and primary coverts, less white on tail tip; *rexpineti* is also similar, but darker on head and throat; *larvivora* is very like last, but bill more robust, wing shorter. Voice. Very noisy. Song (rarely heard) a quaint, melodious warble. Calls include loud, ringing parrot-like screech, "shkréét" (race *nipalensis*), longer, shriller "skréééaréél" (nominate, *layardi*), ringing "kleep" (*siamensis*); also has chuckling notes.

Habitat. Open, light woodland and secondary forest, including teak (*Tectona*), pine (*Pinus*) and oak (*Quercus*) forests, also scrub, groves, edges of clearings and plantations; occurs also in savanna, open and cultivated areas with scattered trees, and gardens. Lowlands and foothills, to 2400 m.

Food and Feeding. Eats large insects and their larvae, including mantids (Mantidae), weevils (Curculionidae), bugs (Hemiptera) and crickets (Gryllidae); also fruits and berries, especially figs (*Ficus*). Favours large trees, usually foraging in treetops but sometimes in bushes or among dead leaves on the ground. Occurs singly, in pairs or in loose flocks; searches methodically for insects, hopping and flying from branch to branch.

Breeding. Jan–Nov; May–Jun in Andaman Is, Apr–May in Myanmar and Mar–Apr in Peninsular Malaysia; apparently two breeding periods, Feb–Apr and Aug–Oct, in W India. Nest a shallow, flimsy saucer of twigs and grass with cobweb on outside, placed up to 18 m above ground in fork of horizontal branch in tree. Eggs 2–3. No other information.

Movements. In Himalayas and peninsular India, subject to local migrations in non-breeding season; also locally nomadic. In Nepal descends to lower altitudes in winter.

Status and Conservation. Not globally threatened. Rare in Himalayas of NE Pakistan and uncommon in Bhutan, but fairly common to common in Nepal, India, Sri Lanka and Bangladesh; common to fairly common in SE Asia. In Pakistan, has become a rare straggler around Murree and Islamabad, where formerly resident. Occurs in a number of protected areas, including e.g. Royal Chitwan National Park, in Nepal, Corbett and Nagarhole National Parks, in India, and Khao Yai National Park, in Thailand.

Bibliography. Ali (1969), Ali & Ripley (1996), Ali *et al.* (1996), Stuart Baker (1918), Cheng Tsohsin (1987), David & Gosselin (2002a), Deignan (1945, 1963), Dickinson & Dekker (2002a), Eames & Ericson (1996), Eames & Robson (1992), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Himmatsinhji (1969), Inskipp & Inskipp (1991), Kazmierczak (2000), Kuroda (1933), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Madoc (1976), Medway & Wells (1976), Rasmussen & Anderton (2005), Ripley (1941, 1982), Roberts (1992), Round (1988), Smythies (1986), Stepanyan (1995), Voous & van Marle (1949), White & Bruce (1986).

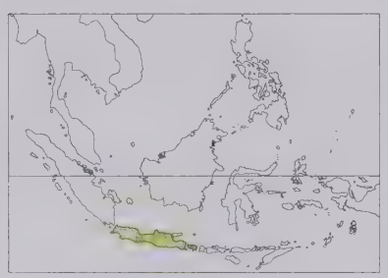
4. Javan Cuckoo-shrike

Coracina javensis

French: Échenilleur de Java **German**: Javaraupenfänger **Spanish**: Oruguero de Java
Other common names: White-vented Greybird

Taxonomy. *Ceblephyris* [sic] *Javensis* Horsfield, 1821, Kepodang-sungu, Java.
Forms a superspecies with *C. macei*, *C. schistacea*, *C. personata*, *C. atriceps*, *C. fortis*, *C. welchmani*, *C. caledonica* and *C. novaehollandiae*, possibly also including *C. caeruleogrisea*; all were formerly treated as conspecific. All races of *C. macei* or, alternatively, only *larutensis* sometimes placed in present species; the decision regarding to which of the two species *larutensis* should be assigned is critical to the resolution of relationships of these taxa, and further study needed. Monotypic.

Distribution. Java and Bali.



Descriptive notes. 28 cm. Male has head and upperparts, including lesser upperwing-coverts, lead-grey; narrow frontal band, lores, face to ear-coverts and above eye, and chin and upper throat, grey-black; median and greater wing-coverts lead-grey, edged paler; alula and primary coverts black, margined grey; primaries and secondaries black, edged whitish, secondaries with largely grey outer webs; tertials grey with blackish inner webs; rectrices black, tipped white, central pair grey, tipped white, outermost pair broadly edged white; lower throat, breast and flanks grey, slightly paler than upperparts, becoming white from centre of belly to vent, sometimes faint grey barring on lateral undertail-coverts; axillaries and underwing-coverts white; iris red-brown to red; bill black; legs black to dark brown. Distinguished from very similar *C. macei* by slightly darker grey colour, blacker primaries and primary coverts, less white on tail tip. Female is like male but paler grey, with grey-black on head extending only from lores to behind eye and side of face, variable grey barring from lower breast and flanks to undertail-coverts. Juvenile is pale grey above and from chin to breast, with dull brown feather tips and white fringes (scaled pattern), primaries and secondaries edged and tipped white, underparts greyish-white with brown scaling/barring; immature resembles adult female, but more extensive grey barring on underparts. Voice. Loud, piercing whistle, "pee-eeo-pee-eeo", and "tweer" or "twee-eet".

Habitat. Open forest, including forest edge and edges of clearings, and savanna. Lowlands, to 1500 m.

Food and Feeding. No information on diet; probably similar to that of *C. macei*. Forages in tops of tallest trees, often at edges of clearings.

Breeding. No information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Not well known. Was regarded as widespread and fairly common in 1990s. Occurs in Baluran National Park, in Java.

Bibliography. van Balen (1999), Dickinson & Dekker (2002a), Dupond (1942), Hawa (1985), Hellebrekers & Hoogerwerf (1967), Inskipp *et al.* (1996), Jeyarajasingam & Pearson (1999), Kuroda (1933), MacKinnon (1988), MacKinnon & Phillipps (1993), Ripley (1941), Robinson (1928), Robson (2000), Sargeant (1997), Sibley & Monroe (1990), Strange (2001, 2002), Voous & van Marle (1949), Wells (2005), White & Bruce (1986).

5. Slaty Cuckoo-shrike

Coracina schistacea

French: Échenilleur schistacé **German**: Schieferraupenfänger **Spanish**: Oruguero Pizarroso
Other common names: Sula Cuckoo-shrike

Taxonomy. *Artamides schistaceus* Sharpe, 1878, Sula Islands.
Forms a superspecies with *C. macei*, *C. javensis*, *C. personata*, *C. atriceps*, *C. fortis*, *C. welchmani*, *C. caledonica* and *C. novaehollandiae*, possibly also including *C. caeruleogrisea*; all were formerly treated as conspecific. Birds from Banggai I sometimes separated as race *petersi*, but considered indistinguishable from those in rest of species' range. Monotypic.

Distribution. Islands off E Sulawesi: Banggai Is (Peleng, Banggai) and Sula Is (Taliabu, Seho, Mangole, Sanana).



Descriptive notes. 31–32 cm. Male is generally slaty grey, with glossy black head, neck, chin and throat; upperwing-coverts and remiges slaty grey, primaries edged paler; tail black; underwing-coverts and undertail-coverts slaty grey; iris dark brown; bill and legs black. Differs from *C. caledonica* in paler general coloration, more extensive black on head. Female lacks black on head and throat, except for dull blackish lores and feathers in front of eye. Juvenile and immature undescribed. Voice. A series of slightly downslurred, nasal, whistling notes, emitted at 1 note per second; also short, unmusical, slightly metallic notes.

Habitat. Primary, secondary and selectively logged lowland forest, degraded forest, lightly wooded swampland and cultivation, and tall mangrove forest.

Food and Feeding. Food includes caterpillars, small lizards and fruit. Forages mainly at 10 m or higher above the ground.

Breeding. No information.

Movements. Nothing recorded.

Status and Conservation. Not globally threatened. Restricted-range species: present in Banggai and Sula Islands EBA. Locally not uncommon in Banggai Is. In Sula Is, common on Taliabu and Mangole, but uncommon on Sanana.

Bibliography. Andrew (1992), Coates & Bishop (1997), Collar & Andrew (1988), Davidson *et al.* (1995), Dickinson & Dekker (2002a), Dickinson *et al.* (2002a), Ripley (1941), Sujatnika *et al.* (1995), Voous & van Marle (1949), White & Bruce (1986).

6. Wallacean Cuckoo-shrike

Coracina personata

French: Échenilleur wallacéen **German**: Wallaceraupenfänger **Spanish**: Oruguero de Wallacea
Other common names: Timor/Lesser Sunda Cuckoo-shrike (*personata*); Kai Cuckoo-shrike (*pollens*)

Taxonomy. *Ceblepyris personata* S. Müller, 1843, Timor.
Forms a superspecies with *C. macei*, *C. javensis*, *C. schistacea*, *C. atriceps*, *C. fortis*, *C. welchmani*, *C. caledonica* and *C. novaehollandiae*, possibly also including *C. caeruleogrisea*; all were formerly treated as conspecific. Has been suggested that *C. fortis* is conspecific with present species. Races *pollens* and *unimodus* sometimes treated as representing a separate species; *floris* and *sumbensis* also sometimes given species status. Putative race *lettiensis* (from Leti, Moa and Sermata), supposedly with weaker bill, considered insufficiently distinct from nominate. Six subspecies recognized.

Subspecies and Distribution.
C. p. floris (Sharpe, 1878) – W Lesser Sunda Is (Sumbawa, Komodo, Rinca, Flores, Besar).
C. p. sumbensis (A. B. Meyer, 1882) – Sumba.
C. p. alfrediana (Hartert, 1898) – E Lesser Sundas (Lomblen, Alor).
C. p. personata (S. Müller, 1843) – Roti, Semau, Timor, Wetar, Romang, Leti, Moa and Sermata.
C. p. unimodus (P. L. Sclater, 1883) – Tanimbar Is (Yamdena, Larat, Loedoe).
C. p. pollens (Salvadori, 1874) – Kai Is.



Descriptive notes. 32 cm. Male nominate race is generally slaty grey above; frontal line, lores, eye region, side of face and neck, ear-coverts, chin and throat black with greenish gloss; scapulars, upperwing-coverts and remiges black, edged slaty grey (edges broader on secondaries and tertials); tail blackish, feathers with grey tips and wash on outer webs; underparts (including undertail-coverts) slaty grey, axillaries and underwing-coverts white; iris, bill and legs black. Differs from *C. fortis* in having more black on head, darker abdomen and undertail-coverts. Female is like male, but lacks black on side of face and throat, has underwing-coverts and axillaries buffy white. Juvenile and immature undescribed. Race *alfrediana* is much paler than nominate, with white lower belly and undertail-coverts, lacks black on face and throat; *floris* is rather darker grey than previous, also has white lower belly and undertail-coverts, but male has black lores, face and throat; *sumbensis* resembles previous but larger, much paler, with more white on belly; *unimodus* is very dark slaty, including on underwing-coverts, belly and undertail-coverts, has black face and throat; *pollens* is like last but even darker, with blackish undertail-coverts. Voice. A series of long, monosyllabic piping whistles; also a long, plaintive "weeeeer", 2–3 upslurred buzzy notes repeated every 2–3 seconds, and nasal, querulous, squabbling notes.

Habitat. Mainly occurs in primary lowland and hill forest, but also in woodland, monsoon scrub, savanna and various forms of cultivation; avoids open areas and eucalypt (*Eucalyptus*) woodland. Nominate race occurs in woodland from sea-level to 2200 m; *floris* in woodland and cultivation up to 1400 m.

Food and Feeding. No information available on food; presumably insectivorous. Forages inconspicuously in forest canopy and in crowns of isolated trees.

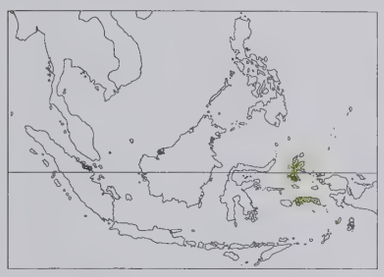
Breeding. Breeds May–Jun on Sumbawa and Flores (race *floris*); nestlings in Mar on Roti (nominate). No other information.
Movements. Apparently sedentary; some local movements possible.
Status and Conservation. Not globally threatened. Widespread and locally common on Flores; moderately common on Komodo, Timor and Tanimbar Is; sparse on Sumba; very uncommon on Kai Is.
Bibliography. Andrew (1992), Coates & Bishop (1997), Dickinson & Dekker (2002a), Johnstone & Jepson (1996), Johnstone *et al.* (1996), Jones *et al.* (1994), Mason & McKean (1982), Ripley (1941), Schodde & Mason (1999), Strange (2001), Trainor (2002a, 2002b), Voous & van Marle (1949), White & Bruce (1986).

7. Moluccan Cuckoo-shrike

Coracina atriceps

French: Échenilleur des Moluques **Spanish**: Oruguero Moluqueño
German: Molukkenraupenfänger
Other common names: Seram Cuckoo-shrike

Taxonomy. *Ceblepyris atriceps* S. Müller, 1843, Celebes; error = Seram.
Forms a superspecies with *C. macei*, *C. javensis*, *C. schistacea*, *C. personata*, *C. fortis*, *C. welchmani*, *C. caledonica* and *C. novaehollandiae*, possibly also including *C. caeruleogrisea*. Two subspecies recognized.
Subspecies and Distribution.
C. a. magnirostris (Bonaparte, 1850) – N Moluccas (Ternate, Halmahera, Kasiruta, Bacan).
C. a. atriceps (S. Müller, 1843) – Seram (S Moluccas).



Descriptive notes. 32–35 cm. Male nominate race has head, neck, upper mantle, chin, throat and breast black with bluish gloss; rest of upperparts, including upperwing-coverts, light slaty grey, paler on rump and uppertail-coverts; alula, primary coverts and primaries black, edged ashy grey, rest of remiges black, outer webs grey; rectrices black, tipped ashy, central pair dark ashy brown, tipped black; abdomen and undertail-coverts pure white, flanks and thighs washed bluish-grey, underwing-coverts and axillaries white; iris dark brown; bill black, legs slaty black. Female has black of head, neck, throat and breast replaced by sooty grey, or throat ashy, breast lighter ashy and lores black. Juvenile and immature undescribed. Race *magnirostris* is larger and darker grey overall than nominate, with hood extending further down on both upperparts and underparts, with less clear-cut edge. Voice. Harsh, staccato dry chatter, occasionally given alternately by two individuals.
Habitat. Primary forest, mainly in hills; also tall secondary and selectively logged forest, coastal casuarina (*Casuarina*) groves and woodland, lightly wooded cultivation; occasionally in mangroves. Ascends to 1200 m on Halmahera and Seram.
Food and Feeding. Food not recorded. Frequents upper tree levels, including the lower canopy, and crowns of subcanopy trees.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Seram EBA and Northern Maluku EBA. Widespread and common on Halmahera; locally common on Seram, mainly in the hills. Poorly known species.
Bibliography. Andrew (1992), Bowler & Taylor (1989), Coates & Bishop (1997), Dickinson & Dekker (2002a), Inskipp *et al.* (1996), Isherwood *et al.* (1997), Michaux (1998), Ripley (1941), Strange (2001), Sujatnika *et al.* (1995), Voous & van Marle (1949), White & Bruce (1986).

8. Buru Cuckoo-shrike

Coracina fortis

French: Échenilleur de Buru **German**: Bururaupenfänger **Spanish**: Oruguero de Buru

Taxonomy. *Graucalus fortis* Salvadori, 1878, Buru Island, South Moluccas.
Forms a superspecies with *C. macei*, *C. javensis*, *C. schistacea*, *C. personata*, *C. atriceps*, *C. welchmani*, *C. caledonica* and *C. novaehollandiae*, possibly also including *C. caeruleogrisea*; all were formerly treated as conspecific. It has been suggested that present species may be conspecific with *C. personata*, but treatment as a separate species seems preferable on grounds of its geographical isolation and also from the fact that it approaches *C. caeruleogrisea* in appearance. Monotypic.
Distribution. Buru, in S Moluccas.



Descriptive notes. 35·5 cm. Male is grey above, with black lores, eye region and chin; rectrices blackish, outermost grey-tipped, centre two as upperparts; throat and underparts grey, paler than upperparts, undertail-coverts ashy white; iris dark; bill and legs black. Differs from *C. personata* in larger size, less extensive black on head, slightly paler abdomen and undertail-coverts. Female is like male, but lores dusky, undertail-coverts purer white. Juvenile and immature undescribed. Voice. No information.
Habitat. Lowland, montane and monsoon forest, including disturbed areas, to 1500 m.
Food and Feeding. No information.
Breeding. Nestling recorded in early Feb. No other information.
Movements. None reported.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Buru EBA. Confined to a single island. Poorly known. Was regarded as unobtrusive but not particularly rare in 1981–1982, but by 1989 was sufficiently rarely encountered for no density estimates to be possible. In 1995–1996 only 14 birds were found, at three localities, suggesting that it is very local. Probably little affected by recent habitat changes, because it occurs in disturbed habitat and appears to prefer higher-altitude forest with open understorey.
Bibliography. Andrew (1992), Coates & Bishop (1997), Collar & Andrew (1988), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Dickinson & Dekker (2002a), Inskipp *et al.* (1996), Jepson (1993), Michaux (1998), Ripley (1941), Stattersfield & Capper (2000), Sujatnika & Jepson (1995), Sujatnika *et al.* (1995), Voous & van Marle (1949), White & Bruce (1986).

9. North Melanesian Cuckoo-shrike

Coracina welchmani

French: Échenilleur de Welchman **Spanish**: Oruguero de Welchman
German: Solomonen-Raupenfänger

Taxonomy. *Graucalus (Artamides) welchmani* Tristram, 1892, Bugotu (= Santa Isabel), Solomon Islands.
Forms a superspecies with *C. macei*, *C. javensis*, *C. schistacea*, *C. personata*, *C. atriceps*, *C. fortis*, *C. caledonica* and *C. novaehollandiae*, possibly also including *C. caerulogrisea*; all were formerly treated as conspecific. In recent decades, present species has normally been treated as conspecific with *C. caledonica*, but the two show notable differences in plumage, sexual dichromatism, iris colour, voice, and habitat preferences; all these factors, combined with significant geographical gap of c. 1000 km of ocean between the two groups, suggest it is more appropriate to revert to their earlier treatment as two separate species. Four subspecies recognized.
Subspecies and Distribution.
C. w. bougainvillei (Mathews, 1928) – Bougainville I.
C. w. kulambangrae Rothschild & Hartert, 1916 – New Georgia Group (Kolombangara, New Georgia and Vangunu), in Solomon Is.
C. w. welchmani (Tristram, 1892) – Santa Isabel.
C. w. amadonis Cain & Galbraith, 1955 – Guadalcanal.



Descriptive notes. 30–33 cm; 133–165 g. A large cuckoo-shrike, with large bill and moderately long tail. Male nominate race has dark slaty-grey head and upperparts, including upperwing-coverts; glossy black on lores, feathers around eye, malar area, chin and throat (sometimes to upper breast), black extending back over eye to form distinct superciliary streak; remiges with ashy-grey outer webs and ashy-brown inner webs, primaries edged whitish; rectrices black, outer feathers narrowly tipped white; entire underparts, including undertail-coverts, underwing-coverts and axillaries, slaty grey; iris dark brown; bill and legs black. Differs from *C. caledonica* in smaller size, greater extent of black on head, upperparts and anterior underparts (thus, also greater degree of sexual dimorphism), presence of gloss on black areas, remaining areas darker grey, dark iris. Female is similar to male, but lacks black on head (except in region of ear-coverts) and throat. Juvenile and immature undescribed. Races differ mainly in depth of coloration and extent of black: *bougainvillei* is paler above than nominate, crown darker than upperparts, black below extends to upper breast; *kulambangrae* is darker above, crown again darker than upperparts, black below extends only to throat, tail proportionately longer; *amadonis* is smallest race, also darkest, with black extending to upper back on male, very dark below, black on male extending to breast, only slightly paler on belly. Voice. Call on Bougainville (race *bougainvillei*) a squeaky "mee-ahh-ahh", on Guadalcanal (*amadonis*) a harsh, creaking "squeei" like a kitten's mew or a squeaky gate; on Kolombangara (*kulambangrae*) most common calls are a long descending whistle reminiscent of a falling bomb, and a shrill creaking 'chi', often repeated. All races have loud, harsh contact and aggression calls and chatters.
Habitat. Forest, usually on hills or mountains, but occasionally reported from foothills or lowlands on Bougainville; often in lowlands on Kolombangara, where more common in mangroves and coastal forest, often degraded forest.
Food and Feeding. Eats large insects and fruit. Forages in pairs, occasionally in small groups, at outer edge of canopy, moving slowly; shuffles its wings when foraging. No other information.
Breeding. Nest-building observed in mid-Aug on Kolombangara. No other information.
Movements. None reported.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Solomon Group EBA. Uncommon to rare; very few records away from Kolombangara, where locally not uncommon. May possibly have suffered some reduction in numbers in lowlands as a result of clearance and degradation of forest habitat, but normally lives in higher-lying areas.
Bibliography. Buckingham *et al.* (1995), Cain & Galbraith (1956), Coates (1990), Galbraith & Galbraith (1962), Dutson (2005d), Hadden (1981), Kratter *et al.* (2001), Mayr (1955, 1978), Ripley (1941), Webb (1992), White & Bruce (1986).

10. South Melanesian Cuckoo-shrike

Coracina caledonica

French: Échenilleur calédonien **Spanish**: Oruguero de Melanesia
German: Melanesienraupenfänger

Taxonomy. *Corvus caledonicus* J. F. Gmelin, 1788, New Caledonia.
Forms a superspecies with *C. macei*, *C. javensis*, *C. schistacea*, *C. personata*, *C. atriceps*, *C. fortis*, *C. welchmani* and *C. novaehollandiae*, possibly also including *C. caerulogrisea*; all were formerly treated as conspecific. In recent decades, present species has normally been treated as conspecific with *C. welchmani*, but the two show notable differences in plumage, sexual dichromatism, iris colour, voice, and habitat preferences; all these factors, combined with significant geographical gap of c. 1000 km of ocean between the two groups, suggest it is more appropriate to revert to their earlier treatment as two separate species. Four subspecies recognized.
Subspecies and Distribution.
C. c. thilenii (Neumann, 1915) – Vanuatu (Espíritu Santo, Malo, Malakula).
C. c. seiuncta Mayr & Ripley, 1941 – Erromango, in S Vanuatu.
C. c. lifuensis (Tristram, 1879) – Loyalty Is (Lifou).
C. c. caledonica (J. F. Gmelin, 1788) – New Caledonia.
Descriptive notes. 30–35 cm; 117–180 g. Male nominate race has slaty-grey head and upperparts, including upperwing-coverts; black forehead, lores, feathers around eye, and chin; remiges with



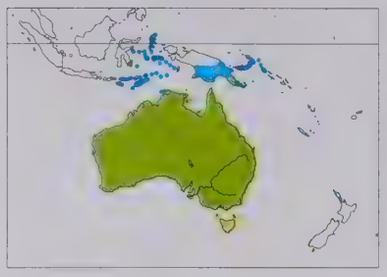
ashy-grey outer webs and ashy-brown inner webs, primaries edged whitish; rectrices black, outer feathers narrowly tipped white; throat and entire underparts, including undertail-coverts, underwing-coverts and axillaries, dark slaty grey; iris yellowish-white; bill and legs black. Differs from *C. welchmani* in larger size, smaller extent of black on head and throat (thus, also lesser degree of sexual dimorphism), lack of gloss on black areas, pale iris. Female is paler overall, more ashy grey, than male, with dusky (not black) lores. Juvenile has belly and underwing-coverts barred paler, tertials with subterminal white spots, rectrices edged and spotted white; immature undescribed. Races differ in general colour tone of plumage, eye colour (dark brown to red-brown in most races) and length of bill and tarsus: *thilenii* is bluish-slate above, blackish-slate on undertail-coverts and underwing-coverts. Voice. Loud whistle, "zweee" or "tseeoo", like that of Common Starling (*Sturnus vulgaris*), usually upslurred and often repeated; song a series of chattering guttural "kwa-kwawa-kwawa" or "kwawa-wa—seee—kwawa-wa—seee" phrases.
Habitat. Forest; fairly common in savanna, cultivated areas, humid forest. Lowlands; absent above 1100 m.
Food and Feeding. Eats insects and fruit. No other information.
Breeding. No information.
Movements. None reported.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Vanuatu and Temoutu EBA and New Caledonia EBA. Poorly known; no recent information on status. Has presumably suffered population reductions as a result of the clearance and degradation of forest habitat.
Bibliography. Birchenough *et al.* (2003), Bregulla (1992), Doughty *et al.* (1999), Dutson (2005d), Hannecart & Létocart (1983), Mayr (1978), Michaux (1998), Ripley (1941), Vuilleumier & Gochfeld (1976), White & Bruce (1986).

11. Black-faced Cuckoo-shrike

Coracina novaehollandiae

French: Échenilleur à masque noir **Spanish**: Oruguero Carinegro
German: Schwarzgesicht-Raupenfänger
Other common names: Large(!)/Greater/White-vented Cuckoo-shrike, Australian Greybird

Taxonomy. *Turdus novae Hollandiae* J. F. Gmelin, 1789, "terra van Diemen" = Adventure Bay, Tasmania.
Forms a superspecies with *C. macei*, *C. javensis*, *C. schistacea*, *C. personata*, *C. atriceps*, *C. fortis*, *C. welchmani* and *C. caledonica*, possibly also including *C. caeruleogrisea*; all were formerly treated as conspecific. Australian populations of nominate race and *melanops* exhibit continent-wide cline of increasing body size N to S. Birds from (N Australia) described as race *didimus*, but considered indistinguishable from *melanops*. Three subspecies recognized.
Subspecies and Distribution.
C. n. subpallida Mathews, 1912 – breeds WC Australia (Pilbara); non-breeding possibly Lesser Sundas and Kai Is.
C. n. melanops (Latham, 1801) – breeds SW, S, E & N Australia and main offshore islands, also locally SE New Guinea (Port Moresby region); non-breeding Moluccas, Lesser Sundas, and E New Guinea E to W Solomons.
C. n. novaehollandiae (J. F. Gmelin, 1789) – breeds Tasmania and islands in Bass Strait (King I, Furneaux Group); non-breeding SE Australia.
Descriptive notes. 32–35 cm; 89–148 g. Male nominate race is light dove-grey on head, upperparts and upperwing-coverts; greenish-black from forecrown to eye and on side of head, neck and throat; alula and primary coverts black, edged light grey; remiges black, edged and tipped white; tail black, feathers tipped white, central two feathers grey; underparts pale grey, white undertail-coverts and underwing-coverts; iris, bill and legs black. Sexes similar. Juvenile has forehead blackish, mixed with grey, lores, feathers around eye and ear-coverts black, throat and cheeks white, throat



with arrow-shaped black bars, head and upper breast with fine crescentic grey barring; immature similar to adult, but black on head confined to mask (from bill through eye to ear-coverts), chin and throat whitish, eye dark brown. Race *subpallida* has much paler grey upperparts, very pale grey breast and whitish belly; *melanops* is similar to nominate but has longer bill, S populations also longer-winged. Voice. A cheerful, repeated "shri-lunk", usually in flight, also a plaintive "plee-urk" and a loud, musical rolling, purring or churring note; also harsh "kreer" and "skair".
Habitat. Open forest, forest edges, clearings and secondary growth, savanna woodland, eucalypt (*Eucalyptus*) woodland in dry areas, and parks and gardens; also cultivation with trees, littoral woodland, mangroves, casuarina (*Casuarina*) groves and ploughed paddocks. Mainly in coastal areas and lowlands, including small islands, but recorded to 1830 m in New Guinea.
Food and Feeding. Eats wide variety of invertebrates, including grasshoppers (Orthoptera), dragonflies (Odonata), cockroaches (Blattodea), termite alates (Isoptera), mantids (Mantodea), lepidopteran larvae, adult and larval beetles (Coleoptera) and bugs (Hemiptera), wasps and ants (Hymenoptera), spiders (Araneae) and worms (Annelida). Vegetable matter, seeds, and fruit such as mistletoe (Loranthaceae), figs (*Ficus*) and berries (*Olea*, *Exocarpus*, *Lycium*) also taken. Forages in foliage and branches of trees, and under bark. Takes most prey by sallying, often sally-pouncing to ground; also gleans, hovers over trees or low over grass, and sometimes (especially migrants) feeds on the ground.
Breeding. May–Feb in N Australia, Aug–Jan in S, and Aug and Oct–Dec in Tasmania, after rains in arid regions; Sept–Dec in New Guinea. Nest built by both sexes, a small, neat, shallow cup of fine twigs, bark, dry grass and needles (especially casuarina needles), lined with finer materials and bound with spider webs, placed usually 8–20 m above ground, sometimes down to 2 m, on horizontal fork of tree branch; parents defend nest by diving at human intruder, alighting between attacks and raising feathers of crown, back and rump, fanning tail and undertail-coverts, and opening beak to show pink-red palate. Eggs 2–3; incubation by both sexes, period not documented; both also care for chicks, which fledge at 22–26 days. Hatching success 54·4–70%; fledging success 30·1%.
Movements. Tasmanian populations (nominate race) cross Bass Strait mainly in Mar–Apr to non-breeding grounds in SE mainland Australia, N to at least R Murray, and recorded also SE New Guinea (Port Moresby region); return passage mainly Sept–Oct. E Australian populations (*melanops*) make regular seasonal movements, most pronounced in Mar–May, wintering Apr–Nov N to N Australia, New Guinea, Bismarck Archipelago and W Solomon Is (very uncommon), and W to S & E Sulawesi subregion, Moluccas and Lesser Sundas of Wallacea; return passage noted mainly Aug–Oct; Wallacea specimens of this race cover all months except Dec–Jan and Mar, and seems likely that migrants may breed there sporadically. W race *subpallida* may migrate to Lesser Sundas and Kai Is; records need confirmation. In Australia, gathers in large numbers before migrating; probably moves to New Guinea on broad front across Coral Sea. Some movements in Australia described as nomadic, but the nature of these not known. Occasional visitor to New Zealand (mostly during Mar–Apr and Jun–Sept; one record in Jan) and Lord Howe I; rare vagrant in New Caledonia.
Status and Conservation. Not globally threatened. Widespread and locally common in Australia; locally common in SE New Guinea. Densities in eucalypt woodland 0·03–0·25 birds/ha; in eucalypt forest 0·01–1 birds/ha. In Australia, possibly not adversely affected by logging, as it occurs in various age-classes of forest. Locally common in S Papua New Guinea (but scarce in N) in non-breeding season.
Bibliography. Aston (1992), Beehler *et al.* (1986), Beruldsen (1980), Blakers *et al.* (1984), Christidis & Boles (1994), Clancy (1985), Coates (1990, 2001), Coates & Bishop (1997), Debus (1985), Diamond (1972), Dickinson & Dekker (2002a), Doughty *et al.* (1999), Filardi *et al.* (1999), Hall (1974), Hardy (1986), Heather & Robertson (1997), Higgins *et al.* (2005), Hobbs (1986), Keast (1958), Liddy (1990), Marchant (1978, 1985a), Mason & McKean (1982), Mayr (1955), Mayr & Rand (1937), McClure (1998), McCulloch (1970), Mees (1961, 1982), Pizzey (1980), Rand & Gilliard (1967), Rensch (1931), Ripley (1941), Schodde & Mason (1999), Serventy & Whittell (1976), Sutton & Filippich (1983), Voous & van Marle (1949), White (1938), White & Bruce (1986), Wood (1994).

PLATE 2 ➤



PLATE 2

inches 6

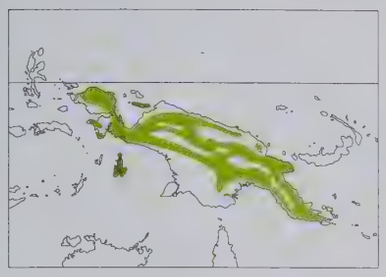
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12. Stout-billed Cuckoo-shrike

Coracina caeruleogrisea

French: Échenilleur à gros bec **Spanish**: Oruguero Picogrueso
German: Dickschnabel-Raupenfänger
Other common names: Blue-grey Cuckoo-shrike, Stout-billed Greybird

Taxonomy. *Campephaga caeruleogrisea* G. R. Gray, 1858, Aru Islands.
Possibly belongs to the superspecies comprised by *C. macei*, *C. javensis*, *C. schistacea*, *C. personata*, *C. atriceps*, *C. fortis*, *C. welchmani*, *C. caledonica* and *C. novaehollandiae*. Three subspecies recognized.
Subspecies and Distribution.
C. c. strenua (Schlegel, 1871) – W & C New Guinea (E to Wahgi Valley), including Yapen I.
C. c. caeruleogrisea (G. R. Gray, 1858) – SC New Guinea and Aru Is.
C. c. adamsoni Mayr & Rand, 1936 – E New Guinea.



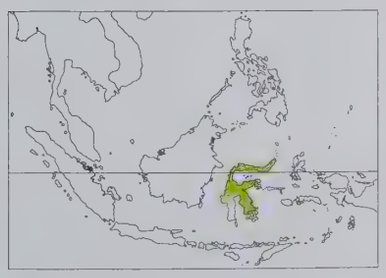
Descriptive notes. 33–37 cm; male 127–170 g, female 116–142 g. Male nominate race is blue-grey above, including upperwing-coverts and tertials, brighter blue on head; chin, and feathers at base of forehead and from bill to eye, black; alula and primary coverts black; primaries black, narrowly edged bluish-grey, secondaries with bluish-grey outer webs and black inner webs; tail black, central two feathers bluish-grey, outer two blackish-brown; bluish-grey below, duller than upperparts; axillaries and underwing-coverts pale rufous and whitish-buff; iris chestnut to blackish-brown; bill and legs black. Distinguished from similar *C. boyeri*, which also has rufous underwing, by much larger size, larger and heavier bill, no black on throat. Female is like male but slightly duller, lacks black on head. Newly fledged juvenile is whitish-grey, with some dark grey on head, breast and wings, whitish upperwing-coverts; immature like female but duller, has buffy-white tips on rectrices. Races differ in size and overall colour, nominate smallest and palest: *strenua* is darkest, intermediate in size; *adamsoni* is largest, has darkest underwing-coverts. Voice. Slightly musical but harsh "shhhyyun-eshhhyuway"; also short chirp, soft mewing slur, soft rasp and harsh buzzy notes.
Habitat. Inhabits forest, forest edges, tall secondary growth and disturbed habitats. In New Guinea, mainly in lowlands, hill forest and lower mountains; present from sea-level up to 1700 m, rarely up to 2450 m.
Food and Feeding. Eats large insects, including weevils (Curculionidae) and other beetles (Coleoptera), also cockroaches (Blattodea) and lepidopteran larvae; fruit and small lizards also taken. Forages in pairs or small parties. Moves slowly, deliberately and inconspicuously through upper levels of trees, mostly perching and walking on larger limbs.
Breeding. Nestling in Nov and fledglings seen in Jan and Apr, indicating breeding late in dry season and early and late in wet season. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Widely distributed; generally uncommon, but locally fairly common. Appears tolerant of disturbed habitats.
Bibliography. Andrew (1992), Beehler (1978a), Beehler *et al.* (1986), Coates (1990, 2001), Diamond (1972), Gilliard & LeCroy (1961), Gregory (1995), Gyldenstolpe (1955), Mack *et al.* (2000), Mayr & Rand (1937), Rand (1942), Rand & Gilliard (1967), Ripley (1941, 1964), Schmid (1993), Strange (2001), Voous & van Marle (1949), White & Bruce (1986).

13. Cerulean Cuckoo-shrike

Coracina temminckii

French: Échenilleur de Temminck **Spanish**: Oruguero de Temminck
German: Temminckraupenfänger
Other common names: Sulawesi/Celebes/Temminck's Cuckoo-shrike

Taxonomy. *Ceblepyris temminckii* S. Müller, 1843, Gorontalo, north Sulawesi.
Sometimes thought to form a species group with *C. larvata*, *C. longicauda* and *C. parvula*. Race *rileyi* possibly indistinguishable from *tonkeana*. Three subspecies tentatively recognized.
Subspecies and Distribution.
C. t. temminckii (S. Müller, 1843) – N Sulawesi mountains.
C. t. rileyi Meise, 1931 – mountains of C & SE Sulawesi.
C. t. tonkeana (A. B. Meyer, 1903) – mountains of E Sulawesi.



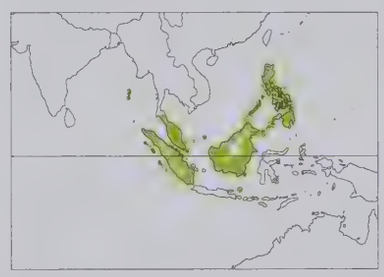
Descriptive notes. 30·5 cm. Distinctive. Male nominate race is almost entirely greyish-azure with cobalt hue, especially on wings and tail; lores and base of forehead blackish with blue gloss, inner webs of primaries and rectrices blackish; underparts, including underwing-coverts and axillaries, like upperparts; iris white or blue-white; bill and legs black. Sexes alike. Juvenile is predominantly dark grey, with pale cross-barring, white subterminal spots on tertials, white edges and spots on rectrices; immature undescribed. Races vary only slightly: *tonkeana* is slightly bluer (less violet-looking) dorsally and paler below than nominate; *rileyi* is slightly greyer than previous. Voice. Vocal, with distinctive and unusual calls which include harsh, nasal upslurred "ssssssschu", sometimes preceded by 2 short, dry notes; 5–7 loud, high-pitched whistles, "pi pí pí pí pí", rather like those of a cuckoo (Cuculidae); short, thin high-pitched note given in flight.
Habitat. Primary forest and tall secondary forest in foothills and mountains, at 100–2200 m, mainly above 500 m; occasionally in pine (*Pinus*) plantations.
Food and Feeding. Food not recorded; presumably insects. Generally moves in small parties of up to eight birds, foraging at middle levels, in subcanopy and in tree crowns. Gleans food from large, lateral branches, vines, trunks and undersides of leaves.
Breeding. Nestling recorded in Oct. No other information available.
Movements. Nothing recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sulawesi EBA. Common and widespread in hill and, especially, montane forest in C Sulawesi; apparently uncommon on outlying ranges such as on N & E peninsulas; apparently absent from much of S peninsula S of Rantepao and Palopo. Old record from Sula Is (to which race *tonkeana* is geographically nearest) requires verification. Occurs in Lore Lindu National Park, in NC part of the island.
Bibliography. Andrew (1992), Andrew & Holmes (1990), Coates & Bishop (1997), Holmes & Phillipps (1996), Inskipp *et al.* (1996), Ripley (1941), Strange (2001), Stresemann (1940), Sujatnika *et al.* (1995), Voous & van Marle (1949), Watling (1983a), White & Bruce (1986).

14. Bar-bellied Cuckoo-shrike

Coracina striata

French: Échenilleur barré **German**: Bindenraupenfänger **Spanish**: Oruguero Barrado
Other common names: Barred Cuckoo-shrike

Taxonomy. *Corvus striatus* Boddaert, 1788, New Guinea; error = Luzon, Philippines.
Race *dobsoni*, considerably different from all others in plumage and proportions, also with different call, sometimes considered a full species; distinctive race *vordermani* may also merit elevation to species rank. Race *cebuensis* (from Cebu, in C Philippines) extinct. Fifteen extant subspecies recognized.
Subspecies and Distribution.
C. s. dobsoni (Ball, 1872) – Andaman Is.
C. s. sumatrensis (S. Müller, 1843) – extreme S Thailand, Peninsular Malaysia (including Tioman I), Sumatra (including Mentawai Is), Riau Archipelago, and Borneo and islands.
C. s. simalurensis (Richmond, 1903) – Simeulue I, off W Sumatra.
C. s. babiensis (Richmond, 1903) – Babi I, off W Sumatra.
C. s. kannegieteri (Büttikofer, 1896 – Nias I, off W Sumatra.
C. s. enganensis (Salvadori, 1892) – Enggano I, off W Sumatra.
C. s. bungurensis (Hartert, 1894) – Anamba Is and N Natuna Is.
C. s. vordermani (Hartert, 1901) – Kangean Is.
C. s. striata (Boddaert, 1783) – N Philippines (Luzon, Polillo, Lubang, Marinduque, Catanduanes).
C. s. difficilis (Hartert, 1895) – W Philippines (Busuanga, Culion, Palawan and Balabac).
C. s. mindorensis (Steere, 1890) – WC Philippines (Mindoro, Libagao, Tablas).
C. s. panayensis (Steere, 1890) – C Philippines (Ticao, Masbate, Panay, Guimaras, Negros).
C. s. boholensis Rand & Rabor, 1959 – EC Philippines (Samar, Calicoan, Biliran, Leyte, Bohol, Panaon).
C. s. kochii (Kutter, 1882) – S Philippines (Nipa, Mindanao, Malamaui, Basilan).
C. s. guillemardi (Salvadori, 1886) – Sula Archipelago (Jolo, Lapac, Tawi-Tawi, Sanga Sanga, Bongao, Simunul, Sibutu).



Descriptive notes. 24–32 cm; 98–128 g. Male nominate race is entirely dark plumbeous grey except for black lores and eyering, and largely black wings and tail; underparts, especially from belly to undertail-coverts, slightly paler than upperparts; iris dark brownish-red to straw-yellow; bill and legs black. Female is dark ashy grey above, lower back to uppertail-coverts barred black and white, lores and side of face dusky; lesser and median upperwing-coverts slightly darker than back, greater coverts ashy grey, remiges black, edged ashy grey, tertials almost entirely ashy grey, tail black; chin to breast ashy grey, rest of underparts, including axillaries and underwing-coverts, barred black and white, thighs dark ashy grey. Juvenile is finely barred black, grey and buff, remiges and rectrices strongly edged buff-white, lower belly to undertail-coverts white, eye brownish-white; immature like adult female, but barring more distinct and extending to breast, young male more leaden grey on upperparts and upper breast. Races differ mainly in size, colour, and/or extent of barring on rump and underparts: *dobsoni* is small, dark, male with bold barring on abdomen, crimson eye; *sumatrensis* male has some bars on rump and uppertail-coverts, indistinct bars on vent, whitish eye; *simalurensis*, *babiensis* and *enganensis* are unbarred in both sexes; *kannegieteri*, *bungurensis* and *difficilis* have unbarred males and barred females; *vordermani* male has barred undertail-coverts, female has unbarred whitish undertail-coverts; *mindorensis* is uniformly grey, female with trace of barring on underwing-coverts; *guillemardi* is similar to previous, but larger; *panayensis* is large, both sexes ventrally barred; *kochii* is smaller than previous, both sexes with less heavy barring on rump and abdomen and less black on lores; *boholensis* differs from last in having more and heavier barring on abdomen and undertail-coverts. Voice. Noisy; has loud, harsh "klee kleep" of 2–4 notes, usually given in flight (Philippines); clear whinnying "kliu-kliu-kliu" or shrill "kriiu-kriiu", and sharp, rising "see-up" (*sumatrensis*); very loud, piercing shrieking call in Andamans (*dobsoni*).
Habitat. Forest, freshwater swamp-forest, secondary growth and scrub; also mangrove forest; occasionally in old rubber and coconut plantations. Occupies mature forest regenerating after disturbance, including from logging. Lowlands to 900 m; to 2000 m in Philippines.
Food and Feeding. Eats adult and larval insects, including mantids (Mantidae), dragonflies (Odonata), beetles (Coleoptera) and lepidopterans; also takes large fruit of the fig *Ficus pisocarpa*. Large hairy caterpillars rubbed against a perch before being eaten; large figs held under a foot and picked apart. Forages in small groups, or in mixed-species flocks, especially with other cuckoo-shrikes and *Lalage* species, from canopy to middle stratum and at edges.
Breeding. Recorded in Apr–May, and dependent fledglings late Aug, in Malaysia; Feb in Sumatra; Apr–May in Philippines. Nest a shallow cup of mosses, small leaves, lichens and rootlets, placed up to 21 m above ground on forked branch of tree. Eggs 2; large chicks fed only by female. No other information.

On following pages: 15. Pied Cuckoo-shrike (*Coracina bicolor*); 16. Barred Cuckoo-shrike (*Coracina lineata*); 17. Boyer's Cuckoo-shrike (*Coracina boyeri*); 18. White-rumped Cuckoo-shrike (*Coracina leucopygia*).

Movements. None recorded.
Status and Conservation. Not globally threatened. Fairly common to uncommon or rare. Numbers probably reduced throughout its range by destruction of lowland forest. Apparently common in Philippines; race *cebuensis* believed extinct on Cebu since at least 1959, as a result of deforestation. Not uncommon in Kangean Is (*vordermani*). Race *sumatrensis* rare to locally fairly common in S Thailand and Peninsular Malaysia, where formerly locally commoner near coasts; no longer occurs in Singapore following destruction of mangrove-forest habitat; probably scarce in Sumatra. This race regarded as "Vulnerable" as a result of habitat destruction; although able to breed in secondary vegetation and isolated trees, it never occurs far from tall forest, with no confirmed occurrence significantly above the steepland boundary; occurs in Taman Negara National Park, in Peninsular Malaysia.
Bibliography. Ali & Ripley (1996), Danielsen *et al.* (1994), Dickinson & Dekker (2002a), Dickinson *et al.* (1991), Dupond (1942), duPont & Rabor (1973a), Evans, Dutson & Brooks (1993), Grimmett *et al.* (1998), Hawa (1985), Jeyarajasingam & Pearson (1999), Kazmierczak (2000), Kennedy *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Medway & Wells (1976), Oberholser (1932), Parkes (1971), Rabor (1959, 1977), Rand & Rabor (1959a), Rasmussen & Anderton (2005), Ripley (1941, 1982), Ripley & Rabor (1958), Robson (2000), Round (1988), Smythies (1999), Voous & van Marle (1949), Wells (2005).

15. **Pied Cuckoo-shrike**

Coracina bicolor

French: Échenilleur bicolore **German**: Zweifarben-Raupenfänger **Spanish**: Oruguero Bicolor
Other common names: Muna/Bicoloured Cuckoo-shrike

Taxonomy. *Ceblepyris bicolor* Temminck, 1824, Sumatra; error = north Sulawesi.
Monotypic.
Distribution. Sulawesi (mainly in N) and adjacent islands (including Bangka, Manterawu, Togian Is, Muna, Buton), also Talaud Is and Sangihe Is.



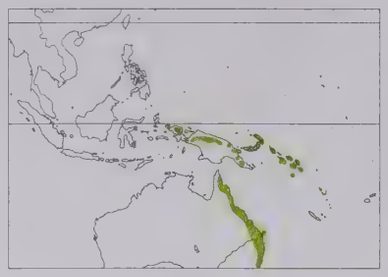
Descriptive notes. 31 cm. Male has top of head, upperparts and entire upperwings black, slightly glossed steel-green, lower back, rump and uppertail-coverts white; tail black, outer feathers tipped white; black of head extends down to lores, below eye and ear-coverts, the last two regions being spotted white; cheeks and entire underparts pure white, underwing-coverts and axillaries white; sometimes a trace of dark barring on rump, cheeks and underparts; iris dark brown; bill grey-blue; legs black. Distinguished from all congeners by combination of black upperparts, white rump and white underparts. Female is grey, not black, on upperparts, with throat and breast grey. Juvenile is like female, but has head and upperparts browner, with white feather edges; immature has grey upperparts, secondaries broadly edged white, rectrices tipped white. Voice. Song a loud, ringing series comprising 3–5 trisyllabic notes followed by 4–8 louder single whistles, this often preceded by several rasping notes.
Habitat. Primary lowland and hill forest, including forest edges and forest with clearings; also scrub and mangroves. To 500 m, sometimes to 900 m.
Food and Feeding. Food not recorded; presumably insects and fruit. Found in parties of 2–5 individuals; frequents the canopy.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Sulawesi EBA and Sangihe and Talaud EBA. Generally uncommon to rare on Sulawesi, and apparently absent from large parts of C & E regions, but locally common in N; uncommon on Buton. Only two records from Sangihe. Range apparently fragmented; forest destruction within the altitudinal range occupied by this species has been extensive in recent decades, and its populations must have suffered a decline. Occurs in Dumoga-Bone National Park, in Sulawesi.
Bibliography. Andrew (1992), Baltzer (1990), Catterall (1997), Coates & Bishop (1997), Collar & Andrew (1988), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Holmes & Phillipps (1996), Inskipp *et al.* (1996), Riley (1997a), Ripley (1941), Sampiri (1996), Stattersfield & Capper (2000), Stresemann (1940), Sujatnika *et al.* (1995), Voous & van Marle (1949), Wardill (1995), Watling (1983a), White & Bruce (1986).

16. **Barred Cuckoo-shrike**

Coracina lineata

French: Échenilleur linéolé **German**: Gelbaugen-Raupenfänger **Spanish**: Oruguero Lineado
Other common names: Lineated/Yellow-eyed Cuckoo-shrike/Greybird

Taxonomy. *Ceblepyris lineata* Swainson, 1825, Moreton Bay, Queensland, Australia.
Ten subspecies recognized.
Subspecies and Distribution.
C. l. axillaris (Salvadori, 1876) – W Papuan Is (Waigeo I) and mountains of W, N & SE New Guinea (Vogelkop, N coastal ranges and Huon Peninsula).
C. l. maforensis (A. B. Meyer, 1874) – Numfoor I, in Geelvink Bay (NW New Guinea).
C. l. sublineata (P. L. Sclater, 1879) – Bismarck Archipelago (New Ireland, New Britain).
C. l. nigrifrons (Tristram, 1892) – N Solomon Is (Bougainville, Choiseul, Santa Isabel).
C. l. ombriosa (Rothschild & Hartert, 1905) – C Solomons (Kolombangara, New Georgia, Rendova and others).
C. l. pusilla (E. P. Ramsay, 1879) – Guadalcanal (S Solomons).
C. l. malaitae Mayr, 1931 – Malaita (S Solomons).
C. l. makirae Mayr, 1935 – San Cristobal (SE Solomons).
C. l. gracilis Mayr, 1931 – Rennell (extreme S Solomons).
C. l. lineata (Swainson, 1825) – NE Australia, from E Queensland S to NE New South Wales.
Descriptive notes. 22–29 cm; 66–100 g. Male nominate race has head, upperparts and upperwing-coverts uniformly dark blue-grey, narrow black line from lores to eye; greater upperwing-coverts edged white; alula, primary coverts and remiges black, edged whitish; rectrices mid-grey, becoming black distally; chin to breast as upperparts; lower breast to undertail-coverts, and axillaries and



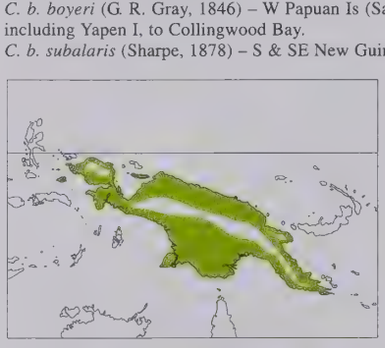
underwing-coverts, barred white and black; iris pale yellow; bill and legs black. Easily distinguished from most congeners by pale yellow eyes and uniform grey upperparts. Female is like male, but lores grey. Juvenile has white areas of underparts tinged yellow; immature similar to adult female, but not properly described. Races differ mainly in size, and in extent of barring below: *axillaris* male has unbarred grey underparts, but female heavily barred below; *maforensis* is similar to previous, but male has fine white bars on breast; *sublineata* is also similar, but male has variable barring on belly, flanks and undertail-coverts; *nigrifrons* male is all light grey, female with abdomen extensively grey and with black bars very narrow; *ombriosa* female has blackest bars below; *pusilla* is very like previous; *malaitae* female has very narrow black bars on belly; *makirae* male has grey underparts with some barring; *gracilis* lacks sexual dimorphism, like nominate but much smaller. Voice. Pleasant chatter, "aw-loo-ack, aw-loo-ack, aw-lack, aw-lack", with tone of toy mouth organ, often given in flight; also repetitive "chirp". In New Guinea also a plaintive, downslurred whistling "whee" or "whee-uuu", often as a duet or in flight, and cat-like notes similar to those of *C. caerulogrisea*; pleasant "trill-yew" on Bougainville.
Habitat. Tropical and subtropical rainforest, eucalypt (*Eucalyptus*) forest, forest edge and secondary growth; also woodland, swamp-woodland, scrub plantations and gardens; often associated with native fig trees (*Ficus*). For breeding prefers woodland and open forest, rather than rainforest. In New Guinea, occurs at 600–1450 m; from sea-level to lower mountains in Bismarck Archipelago and Solomons.
Food and Feeding. Eats mainly fruit, especially *Ficus* but also *Calamus*, *Terminalia* and *Alphitonia*; also some insects, including lepidopteran larvae, dragonflies (Odonata) and beetles (Coleoptera). Forages actively among canopy foliage, in small parties, frequently moving from tree to tree; often associates with other fruit-eating birds. Congregates in parties of up to 50 individuals in non-breeding season.
Breeding. Breeds Oct–Feb in Australia and Oct and Dec in New Guinea; Aug on Bougainville. Both sexes collect nesting material, only one partner may build; nest a shallow saucer of fine twigs, casuarina (*Casuarina*) needles and leaves, bound with cobwebs, decorated with green moss, lichen and bark chips, placed up to 20 m above ground on horizontal or slightly sloping fork of tree branch. Eggs 1–2; both parents incubate, and both also care for nestlings; no information on incubation and fledging periods.
Movements. In Australia, nominate race present throughout year in some areas; in others considered locally nomadic, moving in search of fruit, and at R Murray small parties move S in spring. Lack of records from Torres Strait suggests regular migration unlikely, although there are records of nominate race from lowland New Guinea in Apr and Aug.
Status and Conservation. Not globally threatened. Status in Australia not clear; further fieldwork required. Locally fairly common in Papua New Guinea; widespread and common in the Solomons.
Bibliography. Beehler *et al.* (1986), Beruldsen (1980), Blaber (1990), Blakers *et al.* (1984), Christidis & Boles (1994), Clancy (1989, 1990), Coates (1990, 2001), Doughty *et al.* (1999), Galbraith & Galbraith (1962), Hall (1974), Higgins *et al.* (2005), Keast (1958), Leonard, J. (1998), Mayr (1955), Mayr & Rand (1937), Panetta (1980), Pizzey (1980), Rand & Gilliard (1967), Ripley (1941), Schodde & Mason (1999), Secomb (1992), Sibley (1951), Voous & van Marle (1949), Webb (1992).

17. **Boyer's Cuckoo-shrike**

Coracina boyeri

French: Échenilleur de Boyer **German**: Rostachsel-Raupenfänger **Spanish**: Oruguero de Boyer
Other common names: Rufous-underwing/White-lored Cuckoo-shrike

Taxonomy. *Campephaga Boyeri* G. R. Gray, 1846, Triton Bay, New Guinea.
Two subspecies recognized.
Subspecies and Distribution.
C. b. boyeri (G. R. Gray, 1846) – W Papuan Is (Salawati, Misool), and NW & N New Guinea E, including Yapen I, to Collingwood Bay.
C. b. subalaris (Sharpe, 1878) – S & SE New Guinea (E to Milne Bay).



Descriptive notes. 22 cm; 61–74 g. Male nominate race has crown, nape, side of face and neck bright blue-grey, lores to eye, chin and upper throat black; upperparts and lesser upperwing-coverts duller greyish-blue; rest of upperwing-coverts ashy, edged greyish-blue; alula, primary coverts and primaries black, edged greyish-blue, secondaries and tertials black, broadly edged grey; rectrices black, central pair grey; underparts greyish-blue, underwing-coverts and axillaries orange-chestnut; iris dark brown; bill and legs black. Distinguished from most congeners by small size, pale blue-grey head contrasting with darker grey upperparts, cinnamon underwing-coverts; from *C. caeruleogrisea*, which also has rufous underwings, by much smaller size, shorter and less heavy bill. Female lacks black on head and has whitish lores. Juvenile is like female, but crown, upperparts and underparts mottled white and brown, remiges tipped whitish (tertials also edged whitish), eye deep brown, bill dark grey-brown, legs dark grey; immature also like female, young male lacking black on head, secondaries edged whitish, outer tail feathers tipped white. Race *subalaris* is more extensively black on throat and more orange-buff on underwing-coverts and axillaries than nominate, female with grey lores. Voice. Two or three hard notes followed by sweet, downslurred whistle, "tuk-tuk see-yu", apparently a duet, with short notes given by female and whistle by male; also repeated upslurred whistle, "sweei", clucking, chipping or ticking notes, cat-like mew and a repeated chirruping "chuck". Birds in Wau area have a duet, one bird giving a "weeowee" and the other a "wurr".
Habitat. Forest, forest edge, tall secondary growth, partly cleared areas and, locally, mangrove forest. Mainly in lowlands and hills, from sea-level to 1100 m, rarely to 1450 m.
Food and Feeding. Eats mainly fruit, especially figs (*Ficus*), but also takes insects. Moves in small parties, flying between trees with bouncing flight; rarely joins mixed-species bird parties. Forages mainly in upper canopy, sometimes descending to low secondary growth at forest edges. Gleans insects from bark and crevices while perched and while hovering under boughs.

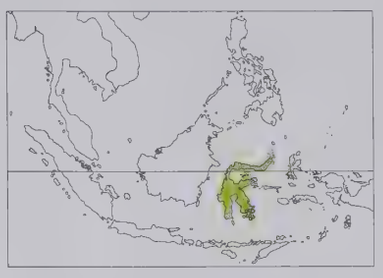
Breeding. Recorded in Oct; recently fledged young recorded in Dec–Jan indicate breeding in period from late dry season to early wet season. One nest was of typical cuckoo-shrike structure, built on horizontal fork of a limb 30 m above ground; both parents fed the nestlings. No other information available.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Very common; the commonest forest cuckoo-shrike in New Guinea. Estimated density in lowland rainforest 10 birds/10 ha.
Bibliography. Andrew (1992), Beehler (1978a), Beehler *et al.* (1986), Bell (1982a, 1982b), Coates (1990, 2001), Diamond (1972, 1987), Gregory (1995), Mack *et al.* (2000), Mayr & Rand (1937), Mees (1965), Rand (1942), Rand & Gilliard (1967), Ripley (1941, 1964), Schmid (1993), Voous & van Marle (1949).

18. **White-rumped Cuckoo-shrike**

Coracina leucopygia

French: Échenilleur à croupion blanc **Spanish**: Oruguero Culiblanco
German: Weißbürzel-Raupenfänger
Other common names: Muna/Sulawesi Cuckoo-shrike

Taxonomy. *Graucalus leucopygius* Bonaparte, 1850, northern Sulawesi.
Forms a superspecies with *C. papuensis* and *C. ingens*. Monotypic.
Distribution. Sulawesi, including smaller islands of Manterawu, Manadotua, Talisei, Bangka, Lembeh, Togian, Tobea, Muna and Buton.
Descriptive notes. 29 cm. Male has dark ashy-grey head and upperparts, white lower rump and uppertail-coverts; forehead, lores, feathers around eye, upper ear-coverts and chin black; scapulars and lesser upperwing-coverts dark ashy grey, rest of upperwing-coverts, alula and remiges blackish, margined ashy grey; rectrices black, tipped grey on outer feathers; throat, breast and thighs



dark ashy grey, becoming white on lower flanks, belly and undertail-coverts; underwing-coverts white; iris yellow or creamy; bill and legs black. Differs from *C. papuensis* in darker grey plumage, blackish central tail feathers, yellow eye. Female is lighter grey than male, has no black on lores and side of face. Juvenile not properly described, but secondaries broadly edged and tipped white, primaries more narrowly so, tail feathers conspicuously tipped white; immature paler than adult, lacks black mask, has light grey face, upperparts, throat and breast, dusky grey barring on breast, with remiges and rectrices as juvenile. VOICE. Call a series of weak, nasal, squabbling/chattering notes, also described as a harsh staccato screech, rather resembles that of *C. papuensis*.
Habitat. Open wooded areas, lightly wooded cultivation, secondary woodland, scrub with trees, and swamp-forest. Sea-level to 800 m, locally to 1100 m in upland valleys.
Food and Feeding. Eats insects. Forages in canopy, sometimes on the ground, rarely in the middle storey.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Widespread and common on Sulawesi. Lives in close proximity to human settlements.
Bibliography. Andrew (1992), Baltzer (1990), Catterall (1997), Coates & Bishop (1997), Holmes & Phillipps (1996), Inskipp *et al.* (1996), Ripley (1941), Stresemann (1940), Voous & van Marle (1949), Watling (1983a), White & Bruce (1986).

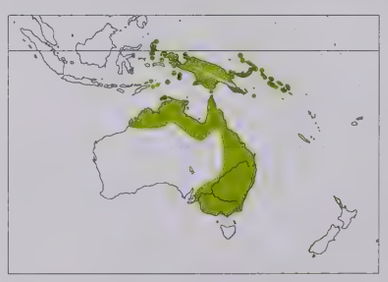


19. White-bellied Cuckoo-shrike

Coracina papuensis

French: Échenilleur choucari **German**: Weißbauch-Raupenfänger **Spanish**: Oruguero Papúa
Other common names: Papuan Cuckoo-shrike (N & E races); White-bellied/White-breasted(!) Cuckoo-shrike/Greybird (*hypoleuca*); Little/Robust Cuckoo-shrike (*robusta*)

Taxonomy. *Corvus papuensis* J. F. Gmelin, 1788, Manokwari, Cendrawasi, north-west New Guinea.
Forms a superspecies with *C. leucopygia* and *C. ingens*. Until recently, the latter form was normally regarded as a race of present species, but it differs notably in large size, stout bill and more slaty coloration, and is probably more appropriately treated as a distinct species. Race *robusta* formerly treated as a full species, but now considered to fall within variation of present species. Birds ascribed to race *timorlaoensis* (of Tanimbar Is) may be nomadic vagrants from Australia. Birds from N Moluccas sometimes separated as race *melanolora*, but considered not satisfactorily distinguishable from nominate, with which merged. Australian races intergrade; proposed race *stalkeri* (E Australia) invalid, as refers to intergradient population in N & C Queensland, and therefore included in *oriomo*. Fourteen subspecies currently recognized.
Subspecies and Distribution.
C. p. papuensis (J. F. Gmelin, 1788) – N Moluccas (Morotai and Halmahera S to Obi), W Papuan Is (Waigeo, Salawati, Misool, Batanta), W & N New Guinea (including Yapen I), Lesser Sundas (Kisar, Luang, Sermata) and Kai Is.
C. p. timorlaoensis A. B. Meyer, 1884 – Tanimbar Is.
C. p. angustifrons (Sharpe, 1878) – C to SE New Guinea.
C. p. intermedia Rothschild, 1931 – SC New Guinea.
C. p. louisiadensis (Hartert, 1898) – Louisiade Archipelago.
C. p. oriomo Mayr & Rand, 1936 – S New Guinea (Trans-Fly region), islands in Torres Strait and NE Australia (Cape York Peninsula).
C. p. apsleyi Mathews, 1912 – coastal N Australia (Melville I, Cobourg Peninsula and shores of Van Diemen Gulf).
C. p. hypoleuca (Gould, 1848) – coastal N Australia (Kimberley E to Gulf of Carpentaria); non-breeding (probably this race) also in Kai Is and Aru Is.
C. p. artamoides Schodde & Mason, 1999 – E Australia (NE Queensland S to NE New South Wales).
C. p. robusta (Latham, 1801) – coastal SE Australia; non-breeding N to New South Wales and S Queensland.
C. p sclaterii (Salvadori, 1878) – Bismarck Archipelago.
C. p. perpallida Rothschild & Hartert, 1916 – N Solomon Is (Bougainville, Choiseul, Santa Isabel, Florida).
C. p. elegans (E. P. Ramsay, 1881) – C & S Solomons (New Georgia Is S to Guadalcanal).
C. p. eyerdami Mayr, 1931 – Malaita I (SE Solomons).



Descriptive notes. 22–29 cm; 55–80 g. Male nominate race has head, upperparts and upperwing-coverts pale grey, paler on rump and uppertail-coverts; black from lores to just behind eye, and narrow black frontal band; greater wing-coverts edged paler grey; alula and primary coverts black, margined white; primaries black with ashy-grey margins, secondaries largely grey on outer webs; slightly notched tail black, tipped pale grey, central two feathers grey; chin white; underparts pale grey, becoming white on belly and undertail-coverts; underwing-coverts and axillaries white; some individual variation in colour tones of plumage; iris very dark brown to black; bill black; legs grey to black. Separated from congeners by combination of pale grey plumage, whitish throat, breast and belly, and small black mask; from very immature *C. novaehollandiae* by smaller size, plain grey throat and breast, no black on ear-coverts. Female has duller, more sooty-black mask. Juvenile has grey (not black) mask, brown and whitish mottling on upperparts and breast; immature paler grey above than adult, underparts white except for grey breast, secondaries white on outer webs. Morphological differences between races complex, based on colour tone of head and upperparts, primary edges and underparts, darkness and extent of facial mask, presence or absence of faint grey ventral barring on female (and of ventral barring in immature), and size (including relative length of tail): *angustifrons* has upperparts much paler than nominate, primaries edged white; *intermedia* has upperparts intermediate in colour between previous and nominate; *oriomo* has head pale grey to mid-grey, less black on face than

nominate, white below but with greyish wash from breast to upper abdomen, light ventral barring; *hypoleuca* is larger than previous, head pale grey, breast white, female with reduced dark mask; *apsleyi* is similar to last but smaller, head pale grey to mid-grey, no ventral barring; *louisiadensis* is also similar, but wing shorter, bill longer; *robusta* is large, has head and upperparts grey, underparts pale grey to whitish (sometimes barred black on breast), rare dark morph has entirely black head, throat and breast (irregular blackish bars on lower breast) shading to dark grey on rest of upperparts and to pale grey on belly; *artamoides* resembles previous, but wing and tail smaller, head dark grey, light ventral barring, no dark morph; *perpallida* is small, pale overall; *elegans* is very like previous; *eyerdami* is also small, but slightly bigger and slightly darker than last two. Voice. Weak, squealing, slurred repeated "whee-eeyu" or "wee-yeer", rather like call of a parrot (Psittacidae), and a longer jumble of notes suggestive of sound of wind chimes; also has peevish "kisseek" or "ker-serk" call.

Habitat. Inhabits many vegetation types, including woodland, savanna, eucalypt (*Eucalyptus*) forest, riparian forest, rainforest, littoral forest, forest edges, secondary growth, mangroves, coconut, teak (*Tectona*) and *Araucaria* pine plantations, wooded farmlands and suburban gardens. Mainly in lowlands to 800 m, but recorded to 1650 m in New Guinea.

Food and Feeding. Eats mainly larger insects, including dragonflies (Odonata), cockroaches (Blattodea), mantids (Mantodea), grasshoppers (Orthoptera), bugs (Hemiptera), beetles (Coleoptera), stick-insects (Phasmatidae), lepidopteran larvae, and ants and wasps (Hymenoptera); spiders (Araneae) also recorded in diet. Also known to take fruit and seeds of plants such as *Ficus*, *Acacia*, *Cassia*, *Enchylaena* and grasses, and occasionally nectar. Usually forages singly, in twos or in small groups; moves slowly through trees from canopy to middle levels. Gleans insects from tree foliage, and also catches prey by sallying and flutter-chasing; occasionally hovers; sometimes forages on ground.

Breeding. Recorded in all months except Jul, in Australia; Aug, Oct, Dec–Jan and Mar–Jun in S New Guinea (Port Moresby region). Nest built by both adults, a small, shallow cup of fine twigs, bark, grass, leaves and vine tendrils, bound with spider webs, decorated with lichen, placed up to 7–10 m above ground on horizontal fork of tree branch. Eggs 1–3; both parents incubate the eggs and care for the nestlings; incubation period 21–22 days, fledging period 22 days. Nest success 52·9%.

Movements. Mainly resident or sedentary. Locally nomadic in Australia during dry winter season, when uncommonly found on islands in Torres Strait. Considered a non-breeding visitor in some parts of N, and race *robusta* probably a spring–summer visitor to SE South Australia; in Queensland, said to move N and towards coast in autumn; mainly a spring–summer visitor to Victoria. Possible passage recorded Australian mainland Mar–May and Sept–Dec. Birds identical with *hypoleuca* of N Australia observed in Kai Is and Aru Is in May, Jun, Nov and Dec. Other movements in Australia are not regular or not on large scale.

Status and Conservation. Not globally threatened. In Australia locally common to rare, and abundant in urban areas of tropics; generally common to very common in New Guinea; common and widespread in Solomon Is, and moderately common to common in N Moluccas; apparently uncommon to rare in E Wallacea. Recorded densities 0·01–1·76 birds/ha in Australia; in New Guinea, density in eucalypt woodland near Port Moresby was 0·08–0·19 birds/ha in 1982. In New Guinea increased greatly in abundance following clearing in Wau Valley, and has invaded other highland areas in disturbed habitats, but no similar increases have been noted in Australia.

Bibliography. Beehler (1978b), Beehler *et al.* (1986), Bell (1982a), Beruldsen (1980), Blakers *et al.* (1984), Christidis & Boles (1994), Coates (1990, 2001), Coates & Bishop (1997), Conole (1994), Doughty *et al.* (1999), Galbraith (1969), Galbraith & Galbraith (1962), Hall (1974), Hardy (1986), Higgins *et al.* (2005), Jaensch (1980, 1982), Keast (1958), Mack *et al.* (2000), Marchant (1989), Mayr (1955), Mayr & Rand (1937), Mees (1972, 1982), Pizzey (1980), Rand (1942), Rand & Gilliard (1967), Ripley (1941), Schodde & Mason (1999), Sibley (1951), Voous & van Marle (1949), White (1973), White & Bruce (1986).

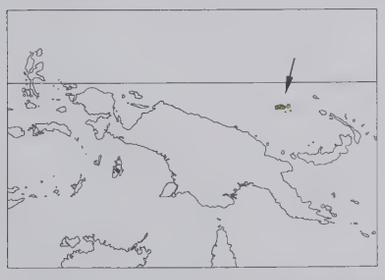
20. Manus Cuckoo-shrike

Coracina ingens

French: Échenilleur de l'Amirauté **Spanish**: Oruguero de la Manus
German: Admiralitätsraupenfänger

Taxonomy. *Graucalus papuensis ingens* Rothschild and Hartert, 1914, Manus, Admiralty Islands.
Forms a superspecies with *C. leucopygia* and *C. papuensis*. Until recently, normally regarded as a race of latter, but differs notably in large size, stout bill and more slaty coloration, and probably more appropriately treated as a distinct species. Monotypic.

Distribution. Admiralty Is (Manus, Los Negros).



Descriptive notes. 28 cm. Male has head and neck medium grey, rest of upperparts and upperwing-coverts dingy slate-grey, paler on rump and uppertail-coverts; black from lores to behind eye, narrow black frontal band; greater wing-coverts edged pale grey; primary coverts black, margined white, alula and primaries black with ashy-grey margins, secondaries largely grey on outer webs; slightly notched tail black, tipped pale grey, central two feathers grey; underparts white, tinged dull ashy grey on throat and breast; underwing-coverts and axillaries white; iris dark brown; bill and legs black. Female has duller black mask. Immature and juvenile not described. Distinguished from similar *C. papuensis* by larger size and stouter bill (also much whiter below than Solomons races of latter); from other congeners by combination of grey upperparts, largely white underparts, small black mask. Voice. Common call "kitcheek" or "sh-zick".

Habitat. Forest edge, especially in tall isolated trees; rare in closed forest. Often around villages and in other disturbed habitats.

Food and Feeding. No information; probably similar to *C. papuensis*.

Breeding. No information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Within context of very limited range, species is widespread, in small numbers, in suitable habitat. As this is a species of degraded habitats, it is unlikely to be at any immediate risk.

Bibliography. Buckingham *et al.* (1995), Coates (1990), Mayr (1955), Schodde & Mason (1999).

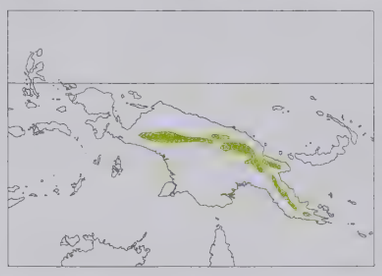
21. Hooded Cuckoo-shrike

Coracina longicauda

French: Échenilleur à longue queue **Spanish**: Oruguero Encapuchado
German: Langschwanz-Raupenfänger
Other common names: Black-hooded/Long-tailed Cuckoo-shrike

Taxonomy. *Graucalus longicauda* De Vis, 1890, Musgrave Range, 7000 to 9000 feet [c. 2130–2740 m], New Guinea.
Sometimes thought to form a species group with *C. larvata*, *C. temminckii* and *C. parvula*. Two subspecies recognized.

Subspecies and Distribution.
C. l. grisea Junge, 1939 – mountains of New Guinea from Snow Mts E to Huon Peninsula and Eastern Highlands Province.
C. l. longicauda (De Vis, 1890) – mountains of SE New Guinea.



Descriptive notes. 33 cm; 92–101 g. Distinctive, with grey and black plumage, very long tail. Male has head, neck, mantle, upper breast, alula, flight-feathers and tail black, head and neck with dark bluish sheen; rest of plumage soft grey, slightly paler on underparts and darker on underwing-coverts and undertail-coverts; iris dark brown to black; bill and legs black. Female is similar to male, but black on forepart of body restricted to "mask" from forehead to above eye, ear-coverts, malar region, chin and throat. Juvenile undescribed; immature similar to adult female. Races differ only in size: *grisea* is smaller than nominate. Voice. Vocal; common call a loud, descending squeal, "jeer-jeer-jeer", like that of a parrot (Psittacidae); also has a jangle of notes, harsh, rasping note ending sharply, plaintive trisyllabic "ti-ae-wi", and short, low-pitched chirp.

Habitat. Tall, dense montane forest, mainly between 2100 m and 2800 m; locally or occasionally as low as 1300 m and as high as 3700 m.

Food and Feeding. Eats mainly insects, including beetles (Coleoptera) and stick-insects (Phasmatidae); a little fruit also taken; small arboreal lizard recorded, and may also eat frogs. Forages in small groups, moving through treetops; hops slowly along branches when gleaning prey.

Breeding. Recorded in Jun and Oct. Nest a shallow cup of fine rootlets, with lichens on outside and small greenish leaves on inside, placed on foundation of moss on horizontal fork 15–20 m above ground. Eggs 1; both parents feed young. No other information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Widespread; often scarce but locally fairly common in its restricted habitat.

Bibliography. Andrew (1992), Beehler (1978a), Beehler *et al.* (1986), Coates (1990), Diamond (1972), Gilliard & LeCroy (1961), Gregory (1995), Ingram (1960), Mayr & Rand (1937), Rand & Gilliard (1967), Ripley (1941, 1964), Voous & van Marle (1949).

22. Halmahera Cuckoo-shrike

Coracina parvula

French: Échenilleur d'Halmahera **Spanish**: Oruguero de Halmahera
German: Halmaheraraupenfänger

Taxonomy. *Graucalus parvulus* Salvadori, 1878, Halmahera.
Sometimes thought to form a species group with *C. larvata*, *C. temminckii* and *C. longicauda*; has been treated as a race of first-mentioned or of *C. personata*. Probably closest to *C. abbotti*. Monotypic.

Distribution. Halmahera, in N Moluccas.



Descriptive notes. 25 cm. Male is predominantly dark bluish-grey; glossy black on narrow forehead band, side of head, chin and throat; primaries black; central two rectrices dark bluish-grey, others black with grey at base, outermost with grey terminal spot; underwing-coverts white; iris apparently dark; bill black; legs dusky. Differs from *C. abbotti* in grey (not white) underparts, much larger size. Female undescribed. Juvenile and immature undescribed. Voice. A series of rapidly repeated staccato, chattering notes, slowing, descending and tailing off towards end.

Habitat. Primary forest and selectively logged hill forest, at 100–900 m.

Food and Feeding. Food presumably insects. Frequents forest canopy and exposed perches in tops of dead trees, from which it sallies.

Breeding. No information.

Movements. No information.

Status and Conservation. Not globally threatened. Restricted-range species: present in Northern Maluku EBA. Extremely poorly known; appears to be local and uncommon in lowlands and more numerous above 700 m. Its numbers must have suffered from habitat destruction, but it does tolerate selectively logged forest.

Bibliography. Andrew (1992), Coates & Bishop (1997), Dickinson *et al.* (2002a), Inskipp *et al.* (1996), Lambert & Yong (1989), Michaux (1998), Ripley (1941), Strange (2001), Voous & van Marle (1949), White & Bruce (1986).

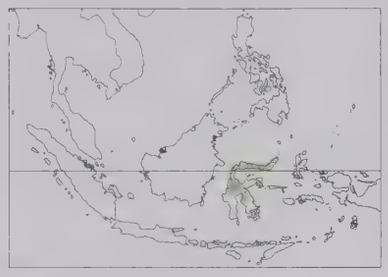
On following page: 23. Pygmy Cuckoo-shrike (*Coracina abbotti*); 24. New Caledonian Cuckoo-shrike (*Coracina analis*).

23. **Pygmy Cuckoo-shrike**

Coracina abbotti

French: Échenilleur d'Abbott **German**: Abbottraupenfänger **Spanish**: Oruguero de Abbott
Other common names: Celebes/(Celebes) Mountain Cuckoo-shrike

Taxonomy. *Celebesia abbotti* Riley, 1918, Rano-Rano, Sulawesi.
Sometimes included in genus *Edolisoma*. Probably closest to *C. parvula*. Monotypic.
Distribution. Mountains of N, NE, C & SW Sulawesi.



Descriptive notes. c. 20 cm. Male has upperparts dark bluish-grey; black on forehead, side of head, chin and throat; primaries black; secondaries, tertials and upperwing-coverts dark bluish-grey; central two rectrices dark bluish-grey, others black; underparts and underwing-coverts white; iris red; bill and legs black. Female has black of head and throat replaced by grey. Juvenile and immature undescribed. Differs from *C. parvula* in white (not blue-grey) underparts, smaller size. Voice. Usual call a thin, high-pitched, descending "thip"; song 2 quiet notes followed by a 4-note warble; sharp "tseet" calls in flight.
Habitat. Mountain forest at 1200–2500 m, mainly above 1400 m.
Food and Feeding. Insectivorous. Accompanies mixed-species parties. Gleans actively in canopy; apparently also behaves like a flycatcher (Muscicapidae), with aerial sallies.
Breeding. Juveniles in Nov, Dec and Mar. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sulawesi EBA. Locally common to uncommon. No information on potential threats, but its numbers must have suffered from habitat destruction. Occurs in Lore Lindu National Park.
Bibliography. Andrew (1992), Andrew & Holmes (1990), Coates & Bishop (1997), Holmes & Phillipps (1996), Inskipp *et al.* (1996), Ripley (1941), Sujatnika *et al.* (1995), Voous & van Marle (1949), Watling (1983a), White & Bruce (1986).

24. **New Caledonian Cuckoo-shrike**

Coracina analis

French: Échenilleur de montagne **Spanish**: Oruguero de Nueva Caledonia
German: Rotsteiß-Raupenfänger
Other common names: New Caledonian Mountain Cuckoo-shrike

Taxonomy. *Campephaga analis* J. Verreaux and Des Murs, 1860, New Caledonia.
Monotypic.
Distribution. New Caledonia (Grande Terre and I des Pins).



Descriptive notes. 24-28 cm; male 97 g, female 70 g. Male is leaden grey above, somewhat paler grey below, with blackish alula and flight-feathers; underwing-coverts, bend of wing and undertail-coverts rufous-chestnut; iris orange-yellow to dark brown; bill blackish; legs blackish. Readily distinguished from other cuckoo-shrikes of the region by combination of grey plumage, chestnut undertail-coverts and deep yellow eye. Sexes alike, but female smaller than male. Juvenile is rather distinctive: has brownish wings, and is variegated rufous-white and blackish below; immature undescribed. Voice. Shrill whistles and a "tu-whit tu-whee" call note.
Habitat. Dense primary forest on mountains, above 200 m.
Food and Feeding. No information.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in New Caledonia EBA. Considered to be fairly common. Present in Rivière Bleue Reserve. No significant threats documented.
Bibliography. Barré & Dutson (2000), Doughty *et al.* (1999), Michaux (1998), Vuilleumier & Gochfeld (1976).

PLATE 4 ➤



PLATE 4

inches 4

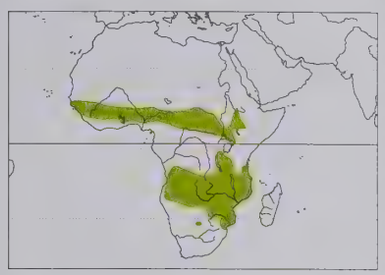
cm 10

25. **White-breasted Cuckoo-shrike**

Coracina pectoralis

French: Échenilleur à ventre blanc **Spanish**: Oruguero Pechiblanco
German: Weißbrust-Raupenfänger
Other common names: Grey-throated/Black-chested Cuckoo-shrike

Taxonomy. *Graucalus pectoralis* Jardine and Selby, 1828, Sierra Leone.
Sometimes considered to form a superspecies with *C. caesia*, from which usually separated by altitude; the two are perhaps better treated as forming a species group, because plumages notably different. Monotypic.
Distribution. S Senegal S to Sierra Leone and E to W Sudan, Ethiopia, Uganda and W Kenya, and from S DRCongo, Rwanda, Burundi and W & S Tanzania S to Angola, N Namibia, N Botswana, Zimbabwe, Mozambique and extreme NE South Africa.



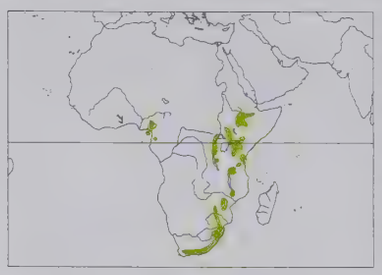
Descriptive notes. 25–27 cm; 49–58 g. Male has black preorbital region and white eyering; grey on head and upperparts and from chin to upper breast, paler on forehead and darker on throat and upper breast; alula, remiges and primary coverts black, edged grey; tail feathers blackish-brown, central pair grey; lower breast to undertail-coverts white, underwing-coverts and axillaries white; iris dark sepia; bill and legs black. Distinguished from *C. graueri* by larger size, paler head, upperparts and upper breast. Female is similar to male, but has chin and upper throat white, grading to pale grey on upper breast, sometimes faint grey bars on lower breast and flanks, also has less black on loral region. Juvenile has top of head to hindneck white with dark brown arrow-shaped marks, dark brown upperparts with white feather fringes and bases, white underparts spotted dark brown, remiges and upperwing-coverts edged white, wing-coverts with black band; immature not fully described. Voice. Fairly loud, long, high-pitched, rather buzzing downslurred whistle lasting 1–1·5 seconds; also a thin, high-pitched "seeeu" whistle, and other weak, high-pitched notes e.g. "tsip-tsip", "tsitsitsi" and "sweet-sweet"; in addition, makes a louder "wreewree-tiuptiup", a rolling repeated "wrrllu", and (male only) a soft whistled "duid-duid".
Habitat. N of equator occurs in mature savanna woodland and bushy savanna with open groves of tall trees, especially acacia (*Acacia*); in S inhabits tall, broadleaf woodland such as *Brachystegia*, *Baikiaea* and mopane (*Colophospermum mopane*). Normally below 1500 m. Where sympatric with *C. caesia*, present species occurs in lower-altitude woodland.
Food and Feeding. Insects, especially caterpillars (Lepidoptera), also orthopterans, hymenopterans (including ants), termites (Isoptera) and mantids (Mantidae). Forages mainly in canopy and upper regions of trees. Gleans trunks, branches and leaves; moves with long hops and pauses to inspect potential sites for prey; also hawks insects (including termite alates) in the air. Occasionally takes prey from the ground. Regularly joins mixed-species flocks.
Breeding. Breeds mainly from end of dry season and through rains; Jun in Gambia, Jan in Ghana, Sept in SE DRCongo, Oct–Feb and May in Malawi, Aug–Dec in Zambia and Zimbabwe, Aug–Sept in Angola, and Nov in South Africa; single-brooded. Monogamous; territorial. Nest usually built by female, but sometimes by male or by both sexes, built in c. 5–6 days; a shallow cup of weed stems, tendrils, leaf petioles or leaf veins, covered and lined with lichens, anchored with spider webs, situated 6–15 m above ground on tree branch, usually in a wide, flat fork. Eggs 1–2; incubation shared by both sexes, period 23 days; chicks fed by both parents, leaving nest at 24–30 days, but remaining dependent on parents for a further 2–3 months; juveniles stay with parents until following breeding season. In Zimbabwe, average success 42%, mean 0·8 fledglings produced per nesting attempt.
Movements. Largely resident; seasonal movements in some areas. In Sudan, some move N in rains; in Central African Republic apparently absent early in dry season (Oct–Jan); in S Africa some move to drier savanna after breeding, and also to lower elevations in Malawi, Zambia and Zimbabwe; occurs mainly in austral winter in N South Africa. Vagrant in Mauritania, SE Kenya, N Tanzania, NW Namibia and S Botswana.
Status and Conservation. Not globally threatened. Generally locally frequent to uncommon in N of range, but rare in Rwanda and Kenya; common in Angola; mainly uncommon S from Malawi and Zimbabwe, and rare in South Africa; local in Namibia and Botswana. Density in Zimbabwe estimated at 1 pair/20 ha. Numbers must be adversely affected by woodland clearance throughout its range; possibly threatened in some parts of Zimbabwe by fragmentation of miombo woodlands. Occurs in numerous protected areas throughout its sizeable range.
Bibliography. Anon. (1992, 2000b), Bannerman (1953), Barlow *et al.* (1997), Benson *et al.* (1971), Borrow & Demey (2001), Brooke (1984a), Brown (1993), Butchart (1997), Byaruhanga *et al.* (2001), Chapin (1953), Cheke & Walsh (1996), Cizek (2001), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Forbes-Watson (1994), Ginn *et al.* (1989), Gore (1990), Grimes (1987), Hall & Moreau (1970), Harrison *et al.* (1997), Hustler & Prescott (1992), Irwin (1980, 1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993), Monadjem (1996), Nikolaus (1987), Penry (1994), Sinclair & Hockey (1996), Skinner (1995), Tarboton (2001), Vernon (1980, 1984), Vincent (1949), Whittingham (1964), Woodall (1971), Zimmerman *et al.* (1996).

26. **Grey Cuckoo-shrike**

Coracina caesia

French: Échenilleur gris **German**: Waldraupenfänger **Spanish**: Oruguero Gris
Other common names: African Greybird

Taxonomy. *Ceblepyris caesia* M. H. K. Lichtenstein, 1823, Eastern Cape Province, South Africa.
Sometimes considered to form a superspecies with *C. pectoralis*, from which usually separated by altitude; the two are perhaps better treated as forming a species group, because plumages notably different. Proposed race *preussi* (E Nigeria and Bioko I), with slightly darker throat than *pura*, seems better merged with latter. Two subspecies currently recognized.
Subspecies and Distribution.
C. c. pura (Sharpe, 1891) – SE Nigeria (Obudu Plateau), W Cameroon and Equatorial Guinea (Bioko I and Mt Alen); also Ethiopia, SE Sudan, Uganda and NE DRCongo S to Malawi and adjacent NW Mozambique.
C. c. caesia (M. H. K. Lichtenstein, 1823) – Zimbabwe and Mozambique S to South Africa.



Descriptive notes. 25–27 cm; 53–66 g (nominate), 40–63 g (*pura*). Male is almost entirely uniform medium grey, paler on forehead and forecrown and around eye, with black preorbital region and white eyering; remiges, alula and primary coverts black with grey outer edges; rectrices blackish to blackish-grey, becoming paler towards tips; underwing-coverts and axillaries pale grey; iris dark brown to black; bill and legs black. Differs from *C. pectoralis* and *C. graueri* in having grey, not white, underparts. Female is paler than male, especially on chin and throat, with preorbital area grey. Juvenile is distinctive, dark brown with grey-white fringing and barring above, white with dark grey-brown bars below, with black tail tipped or edged white; immature not fully described. Race *pura* differs from nominate in smaller size. Voice. Thin, high-pitched, downslurred whistle, "seeea" or "peeee-oooo", lasting c. 0·5 seconds; also high-pitched trilling and chittering notes, a chattering like that of a weaver (*Ploceus*), sneeze-like "chi-oo", and quiet "tseeee" or "tsiptsip tswee" when foraging; wispy "swee" note at nest.
Habitat. Evergreen forest, forest patches, well-wooded watercourses with tall trees, and scattered trees between forest patches; occasionally in old pine (*Pinus*) and wattle (*Acacia*) plantations, and in suburban gardens (South Africa). In non-breeding season in South Africa, also in woodland, usually denser growth along drainage lines, and even in dense bush dominated by acacia (*Acacia*) with evergreen thickets. Typically at higher altitudes, above 1000 m in W Africa and 1500–3000 m in C & E Africa, but also down to 900 m or lower in E Tanzania, and exceptionally near sea-level in coastal Cameroon and Kenya; farther S occurs at lower elevations, mainly below 1200 m in Zimbabwe and to sea-level in South Africa. Found at higher altitudes than *C. pectoralis*, and also in forest (not woodland), where the two sympatric; generally at higher elevations than forest-dwelling *C. graueri*.
Food and Feeding. Takes insects, particularly caterpillars (Lepidoptera), crickets (Gryllidae) and grasshoppers (Orthoptera), as well as termite alates (Isoptera) and beetles (Coleoptera); also spiders (Araneae). Forages in canopy, catching insects by hawking from a perch or by hopping and picking up prey on trunks and branches; perches on branches and peers upwards at undersides of leaves, flying up to snatch prey thus seen and returning to perch to swallow it. Regularly joins mixed-species parties.
Breeding. Breeds during rains, but avoids wettest months: Aug and Dec in Sudan, possibly Feb–Mar in Ethiopia; Jan–Mar, Aug, Oct and Dec in Uganda, Kenya and Tanzania; Jan–Jun and Aug in DRCongo and Sept in Malawi; Nov–Dec in S, but nest-building recorded Sept in S South Africa; birds in breeding condition in Nov in Cameroon. Monogamous. Nest built by both sexes, a shallow bowl of *Usnea* lichens bound with spider webs, plastered on to sloping fork or on branch, fairly high (up to 20 m) in tree. Eggs 1–2; incubation by both sexes, period unknown; no information on fledging period; young remain with parents until following breeding season.
Movements. Largely resident, but some local seasonal movements. Some post-breeding migration to lower elevations in Cameroon. In South Africa, altitudinal migration in N (former Transvaal) from high forests to base of escarpments and lowvelds (non-breeding visitor Feb–Jul and Oct, and to bush at 800 m in Pietermaritzburg (KwaZulu-Natal) and E Cape coast; non-breeding visitor and vagrant (occasional breeding attempts) in SW Cape. Also some movements in Zimbabwe, where one found at Emberengwa Mt (300 km W of normal range), and in Kenya (one on coast, 100 km NE of Usambaras, in Mar). Vagrant in Central African Republic (Manovo–Gounda–Saint Floris National Park).
Status and Conservation. Not globally threatened. Locally frequent to common in N of range, but rare on Bioko I; mainly uncommon S from Malawi and Zimbabwe. Density in NE South Africa 6 birds/4·5 ha. May be threatened by forest clearance, although increases in secondary forest and forest-edge habitats may have been beneficial locally. Tolerates presence of humans and occurs in town and garden trees. Occurs in a number of national parks and other protected areas.
Bibliography. Bannerman (1953), Bennun & Ngoroje (1999), Benson & Benson (1977), Berruti *et al.* (1994), Blake *et al.* (1990), Brown & Britton (1980), Burgess & Mlingwa (2000), Byaruhanga *et al.* (2001), Chapin (1953), Clancey (1964), Cordeiro (1994a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Fotso (1996), Ginn *et al.* (1989), Hall & Moreau (1970), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Macdonald (1984b), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993), Martin *et al.* (1979), McGill & Nixon (1991), Nikolaus (1987), Pickles (1989), Prigogine (1980b), Rodewald *et al.* (1994), Sinclair & Hockey (1996), Skead (1995), Steyn (1996), Stuart (1986), Symes *et al.* (2002), Tarboton (2001), Tarboton *et al.* (1987), Tye (1992), Vernon (1972a, 1980).

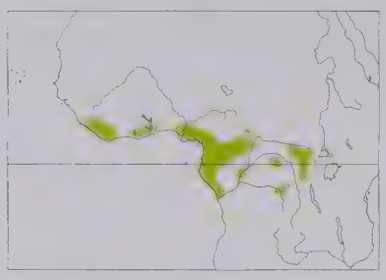
27. **Blue Cuckoo-shrike**

Coracina azurea

French: Échenilleur bleu **German**: Azurraupenfänger **Spanish**: Oruguero Azulado
Other common names: African Blue Cuckoo-shrike

Taxonomy. *Graucalus azureus* Cassin, 1852, Sierra Leone.
Sometimes thought to form a superspecies with *C. graueri*. Monotypic.
Distribution. Sierra Leone E, discontinuously, to S Ivory Coast, S Ghana and Togo, S Nigeria and SW Cameroon, S to Gabon, SW PRCongo (Mayombe) and adjacent NW Angola (Cabinda); also SW Central African Republic and N & C DRCongo.
Descriptive notes. 21 cm; 43–51 g. Distinctive. Male is entirely brilliant glossy blue, except for black forehead, preorbital region and band above eye, bluish-black chin, ultramarine throat, black rectrices (central pair edged blue), and black alula, primaries and secondaries (edged blue); iris brownish-red to dark crimson; bill and legs black. Female is similar to male, but greener, less brilliant blue, with throat as underparts. Juvenile is like female, but belly feathers edged white,

On following pages: 28. Grauer's Cuckoo-shrike (*Coracina graueri*); 29. Madagascar Cuckoo-shrike (*Coracina cinerea*); 30. Mauritius Cuckoo-shrike (*Coracina typica*); 31. Reunion Cuckoo-shrike (*Coracina newtoni*).



secondaries and primary coverts edged white and mottled blue-grey, tertials with distal black and white bars, tail tipped white, eye brownish-red; immature not fully described. Voice. Relatively vocal. Calls include a hoarse, nasal "chwee-ep" or "chuee", short "chupr" and a series of "tuk" notes. Song in Gabon is a clear, powerful, downslurred "peeeoo" prefaced by a short "chup"; calls well spaced, and often punctuated by conversational "chup-puji" or "wee-chup" calls or by chattering "chachacha-chacha". Song in Ivory Coast more nasal, a mixture of upslurred and downslurred notes, e.g. "pooeet-pooit-pooeet-peeoo", interspersed with sharp fast chatter and nasal "wer-tit".

Habitat. Lowland primary forest and mature secondary forest; also open woodland and sometimes clearings; rarely descends to undergrowth and edges. In E DRCongo occurs below 1190 m, thus at lower elevations than those occupied by *C. graueri*.

Food and Feeding. Eats mainly caterpillars (Lepidoptera) and grasshoppers (Orthoptera); also termite alates (Isoptera), beetles (Coleoptera), snails (Gastropoda); occasionally fruit, such as *Croton*. Forages in foliage of upper canopy and treetops; sallies like a flycatcher (Muscicapidae), snatching prey in the air and from foliage; also gleans while running or hopping along branches and vines, and takes prey from undersides of leaves. Joins mixed-species bird parties, especially in dry season.

Breeding. Mainly Nov–Mar, when rainfall relatively low; breeding activity in Jan and Mar in Liberia, Feb and May in Ghana, Feb in Nigeria and Oct–Feb in Gabon; breeding condition in Sept in Angola. Monogamous; probably territorial. Nest a loose bowl of lichens and spider webs on horizontal tree branch. No other information.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Rare to uncommon in some areas. Was locally frequent to common in some parts of range in 1980s, when estimated density in NE Gabon was 5–7 pairs/km². Known range fragmented. Has suffered considerably from habitat destruction. Occurs in some protected areas, including Taï Forest National Park, in Ivory Coast, and Korup National Park, in Cameroon.

Bibliography. Bannerman (1953), Borrow & Demey (2001), Brosset & Érard (1986), Butynski (1994), Carroll (1988), Chapin (1953), Cheke & Walsh (1996), Christy & Clarke (1994), Dean (2000), Demey & Fishpool (1991), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Dowsett-Lemaire *et al.* (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Gee & Heigham (1977), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Hopkins (1970), Keith *et al.* (1992), Mackenzie (1979), Mackworth-Praed & Grant (1973), Prigogine (1953, 1980b), Rodewald *et al.* (1994).

28. Grauer's Cuckoo-shrike

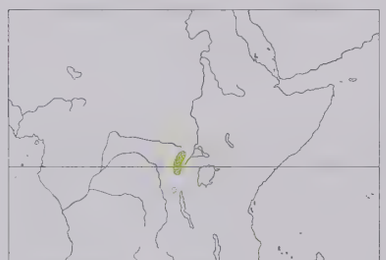
Coracina graueri

French: Échenilleur de Grauer **German**: Silberraupenfänger **Spanish**: Oruguero de Grauer

Taxonomy. *Coracina graueri* Newman, 1908, 90 km W of Lake Edward, DRCongo.

Sometimes thought to form a superspecies with *C. azurea*. Relatively fine bill and colour of upperparts suggest possible link with *C. cinerea* of Madagascar and with Asiatic group comprising *C. melaschistos*, *C. fimbriata* and *C. melanoptera*. Monotypic.

Distribution. E DRCongo.



Descriptive notes. c. 22 cm. Grey and white cuckoo-shrike with relatively fine bill. Male has entire head, upperparts and breast dark slate-grey, blacker on lores, around eye and from chin to breast; slight greenish-blue gloss on upperparts, side of neck and breast; wings dark slate-grey, glossy blue-green edges of secondaries, tertials and upperwing-coverts; alula and primaries black; tail black with bluish sheen, outer two feathers tipped white; underparts white, lower flanks and thighs medium grey; underwing-coverts and axillaries white; iris dark brown; bill black; legs blackish-grey. Differs from similar *C. pectoralis* by smaller size, darker grey head, upperparts and breast; from *C. caesia* by white underparts. Female is slightly paler above than male, medium grey on side of head and neck, and chin to upper breast, darker lores, and has pale buff undertail-coverts. Juvenile is like female, but forehead light grey, lores spotted black, throat grey with some blackish feathers, undertail-coverts beige; immature not fully described. Voice. Undescribed.

Habitat. Montane and transitional forest, at 1150–1900 m. Separated altitudinally from *C. azurea*, which occurs at lower elevations (below 1190 m); typically at lower elevations than *C. caesia*.

Food and Feeding. Feeds mainly on caterpillars (including hairy ones). Foraging in canopy and middle levels, also in understorey.

Breeding. Laying dates Jan, May and Jun, at end of rains. No other information.

Movements. Apparently sedentary.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Albertine Rift Mountains EBA. Extremely local and uncommon within its small range. Found only in highlands along W side of Albertine Rift from Djugu and Mongbwalu (W of L Albert) S to Lutunguru (W of L Edward); also from Mt Kahuzi S to R Elila W of Uvira. Potentially threatened by forest clearance for slash-and-burn agriculture, and by unregulated logging.

Bibliography. Chapin (1953), Collar *et al.* (1994), Dowsett (1985a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1973), Pedersen (2000), Prigogine (1953, 1980b), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Vande weghe (1992).

29. Madagascar Cuckoo-shrike

Coracina cinerea

French: Échenilleur malgache **Spanish**: Oruguero Malgache
German: Madagaskarraupenfänger

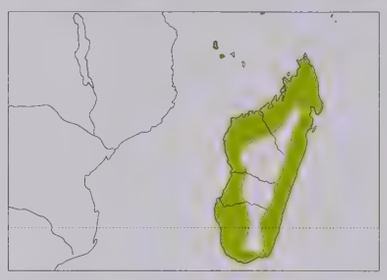
Other common names: Ashy Cuckoo-shrike; Comoro Cuckoo-shrike (*cucullata* and *moheliensis*)

Taxonomy. *Muscicapa cinerea* Statius Muller, 1776, Madagascar.

Relatively fine bill and colour of upperparts suggest possible link with *C. graueri* of E DRCongo and with Asiatic group comprising *C. melaschistos*, *C. fimbriata* and *C. melanoptera*. Races *cucullata* and *moheliensis* sometimes considered a separate species by virtue of differences in plumage, size and voice. Form described as *C. sulphurea* is a colour morph of *cucullata*. Four subspecies recognized.

Subspecies and Distribution.

C. c. cucullata (Milne-Edwards & Oustalet, 1885) – Grand Comoro (Njazidja), in Comoro Is.
C. c. moheliensis Benson, 1960 – Mohéli (Mwali), in Comoro Is.
C. c. cinerea (Statius Muller, 1776) – N & E Madagascar.
C. c. pallida Delacour, 1931 – W, C & SW Madagascar.



Descriptive notes. 22–24 cm; 41·5–45g (nominate). Male nominate race has entire head and neck black, upperparts, including upperwing-coverts and tertials, uniform dark grey; alula, primary coverts, primaries and secondaries black, edged grey; tail grey, outer feather pair blackish with white tips; underparts (including underwing) pale grey, lighter on breast; iris dark reddish-brown; bill and legs black. Readily distinguished from African congeners by combination of black hood, grey upperparts and pale grey (not white) underparts. Female has grey head and neck, and paler grey upperparts than male. Juvenile is similar to female, but upperwing-coverts edged buff; immature not fully described. Race *pallida* is paler overall than nominate, male also having grey hood separated by whitish area from pale grey underparts, and white undertail-coverts; *cucullata* is smaller, darker above, marginally paler on head, dark nuchal collar, almost white underparts, upper chest pure white, also occurs as olive morph having olive-green hood and upperparts and primrose-yellow underparts ("*sulphurea*"); *moheliensis* differs from previous mainly in having no contrast between crown and mantle, slightly stronger grey wash on underparts (including chest), also no olive morph. Voice. Distinctive song, often heard, a series of hard notes followed by fluted notes that decrease in volume, "kiap kiap kiap kiap cheeekeekeekee-kee-kee-kee-kee"; often repeated, and "kee" notes may be replaced by "kick-oo" notes. Race *cucullata* has softer "cheekee keedee" call.

Habitat. Lowland to mid-altitude humid evergreen forest, dry forest, gallery forest, forest edge, secondary growth, scrub and mangroves; sometimes adjacent degraded terrain; from sea-level up to 2300 m.

Food and Feeding. Eats variety of invertebrates, including beetles (Coleoptera), lepidopteran and other larvae, orthopterans, cicadas (Cicadidae), mantids (Mantidae), spiders (Arachnida), centipedes (Chilopoda), myriapods; fruit remains found in one stomach. Often accompanies mixed-species flocks. Usually forages in canopy, sometimes in middle levels, searching foliage and branches. Prey often struck against a perch before being swallowed.

Breeding. Nov–Mar. Nest shallow, bowl-shaped, largely of mosses and lichens, usually placed on horizontal branch high in tree. Lays 1 egg. No other information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Common in suitable habitat in Madagascar; uncommon in Comoros. Presumably at some degree of risk as a result of forest destruction, but few data available.

Bibliography. Bangs (1918), Benson (1960, 1971b), Benson *et al.* (1976), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Eguchi *et al.* (1993), Fjeldså *et al.* (1999), Horne (1987), Langrand (1990, 1995), Louette (1988), Louette *et al.* (1988), Milon *et al.* (1973), Morris & Hawkins (1998), Safford & Duckworth (1990), Sinclair & Langrand (1998), Thompson *et al.* (1987), Yamagishi *et al.* (1997).

30. Mauritius Cuckoo-shrike

Coracina typica

French: Échenilleur de Maurice **Spanish**: Oruguero de Mauricio
German: Mauritiusraupenfänger

Taxonomy. *Oxynotus typicus* Hartlaub, 1865, Mauritius.

Sometimes placed in a separate genus *Coquus*. Forms a superspecies with *C. newtoni*. No other obviously close relatives; plumage similarities (including marked sexual dichromatism and sequence of immature plumages) with Australasian *C. tenuirostris*, *C. schisticeps* and *C. melas* may indicate either common ancestry or convergence. Monotypic.

Distribution. S Mauritius.



Descriptive notes. 22 cm; one male 43 g. Male has top and side of head slate-grey, upper lores and stripe over eye whitish, ear-coverts pale grey; upperparts, including lesser upperwing-coverts, slate-grey; rest of upperwing-coverts, and remiges, blackish, edged slate-grey, primaries and secondaries edged and tipped white; rectrices black, central pair edged grey, others tipped white; chin and throat white, underparts light grey, undertail-coverts white; underwing-coverts and axillaries white; iris hazel; bill and legs black. Distinguished from similar *C. newtoni* by darker upperparts. Female has olivaceous-brown head, whitish lores, rufous-mottled ear-coverts and white chin; dull rufous-brown upperparts, more brick-red on rump and uppertail-coverts, dull rufous-brown lesser coverts, rest of upperwing-coverts, and remiges, blackish-brown, edged reddish-brown, primaries tipped whitish; rectrices blackish, tipped pale reddish, central pair brown; underparts chestnut, paler on underwing-coverts. Juvenile has brown upperparts with buff and blackish crescentic markings, pinkish-white underparts with dark streaks; immature like adult female, young male having variable amount of white mixed with chestnut of underparts. Voice. Melodic series of short whistles preceded by few sharper, faster notes, female uttering fewer whistled notes than male; female has "buzz kek" contact call. Also has harsh "tschrek" call note, scolding "kek" and aggressive squeak.

Habitat. Canopy of moist tropical evergreen forest, also adjacent degraded or altered forest, and scrub; 200–800 m, mostly above 460 m.

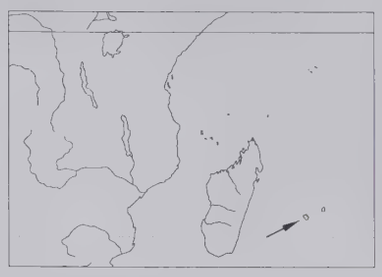
Food and Feeding. Food mainly large arboreal arthropods, including mantids (Mantodea), stick-insects (Phasmatidae), bush-crickets (Tettigoniidae), beetles (Coleoptera), adult and larval lepidopterans, and spiders (Arachnida); also takes geckos (Gekkonidae). Jumps or flies between perches, searching trunks, branches, twigs and leaves; prey usually captured by gleaning, sometimes by "leap-snatching"; also catches prey in air by hovering or direct flight. Large prey beaten against branches. Sometimes joins mixed-species flocks.
Breeding. Breeds Sept–Mar, during rains. Monogamous; permanently territorial. Nest built by both sexes, a very shallow cup of fine twigs, lichens and spider webs, usually attached to horizontal fork of tree branch. Eggs 2–3; incubation by both sexes, period 24–25 days; chicks fed by both parents, fledging at 22–24 days; young may remain with parents for over 3 months. Nests often preyed on.
Movements. None recorded.
Status and Conservation. VULNERABLE. Restricted-range species: present in Mauritius EBA. Has very small range (c. 117 km², comprising four areas) and small population, estimated at 300–350 pairs in 2000. Highest recorded density 25 territories/km². Habitat loss and degradation have caused long-term population decline since human colonization of the island, and remain a threat. Introduced predators and, to lesser extent, cyclones, take a heavy toll on nests; introduced Common Myna (*Acridotheres tristis*) eats similar food and may be a competitor. Since 1975, this species' population, range and density have increased as a result of conservation action to rehabilitate native ecosystems, and it has colonized lowlands in two areas. It is intended to translocate pairs to new areas on Mauritius, and eventually also to adjacent islets after rehabilitation of islet ecosystems. Conservation status could be downlisted to that of Near-threatened if such action successful, although population would have to increase by 50–70%.
Bibliography. Benson (1971b), Cheke (1983, 1987a), Cheke & Jones (1987), Collar & Stuart (1985, 1988), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Green & Hirons (1991), Horne (1987), King (1978/79), Lorence & Sussman (1986), McKelvey (1977), Meinertzhagen (1912), Pollen (1866), Procter & Salm (1974), Safford (1997, 2000), Safford & Beaumont (1996), Safford & Jones (1997, 1998), Sinclair & Langrand (1998), Stattersfield & Capper (2000), Temple (1974), Temple *et al.* (1974).

31. **Reunion Cuckoo-shrike**

Coracina newtoni

French: Échenilleur cuisenier **German**: Newtonraupenfänger **Spanish**: Oruguero de Reunión

Taxonomy. *Oxynotus newtoni* Pollen, 1866, Reunion Island.
Forms a superspecies with *C. typica*. No other obviously close relatives; plumage similarities (including marked sexual dichromatism) with Australasian *C. tenuirostris*, *C. schisticeps* and *C. melas* may indicate either common ancestry or convergence. Monotypic.
Distribution. NW Reunion I.
Descriptive notes. 22 cm. Male has ashy-grey upperparts, paler on rump and uppertail-coverts, blackish spot in front of eye, dull ashy-grey ear-coverts and face side spotted white below eye; upperwings black, narrow grey margins on wing-coverts, whitish edges and tips of primaries and secondaries; rectrices black, tipped white; chin and upper throat greyish-white, underparts pale grey, white on central belly, undertail-coverts and underwing-coverts; iris brown; bill and legs blackish or bluish. Distinguished from similar *C. typica* by paler grey upperparts. Female has very obvious narrow white eyebrow, dark rusty-brown upperparts, paler on head side, faintly barred dusky on rump and uppertail-coverts, dark brown upperwing-coverts (except lessers) and remiges



edged rusty brown (primaries edged whitish-brown); underparts whitish, finely barred dull blackish, breast and flanks washed fulvous. Juvenile is similar to female; immature not fully described, apparently similar to adult female. VOICE. Male has shrill, clear, repeated whistled, "tui", and harsh, scolding "kek", often repeated; female a harsh alarm note; both sexes also have aggressive squeak.
Habitat. Primarily canopy of closed montane moist forest, including steep, forested gulleys, and occurs also in areas of heath (*Philippa montana*) within forested areas and occasionally in Japanese red cedar (*Cryptomeria japonica*) plantations; 1150–1850 m. Formerly occurred down to 800 m, but forest at lower altitudes now lost.
Food and Feeding. Chiefly insectivorous; fruits of some native trees (*Aphloia*, *Ficus*) also taken. Eats adult and larval beetles (Coleoptera), especially longhorn beetles (Cerambycidae), also adult and larval lepidopterans, flies (Diptera), hymenopterans, orthopterans, stick-insects (Phasmida), bugs (Hemiptera), dragonflies (Odonata), spiders (Arachnida); also earthworms, possibly taken on the ground. Principal food formerly palm beetles (*Oryctes*), but destruction of palm trees led to extinction of this prey. Forages mostly in upper two-thirds of trees, preferably among open branches; avoids dense, low vegetation. Gleans leaves, branches and trunks of trees, moving slowly, watching carefully and making short strikes; sometimes probes bark and lichens, and may hover to reach leaves.
Breeding. Sept–Feb; nest-building can begin late Aug and take a month to complete; may be double-brooded. Monogamous; territorial, territory size apparently 6–8 ha. Nest built by both sexes, a small, inconspicuous cup of twigs, moss, lichens and spider webs, usually placed in fork near top of tree, 4–17 m above ground. Eggs 2–3; incubation 3–3·5 weeks; young leave nest at c. 20 days of age, before able to fly. Fledging success 0·93 young/pair.
Movements. Resident; seasonal records from heath attributed to post-breeding dispersal.
Status and Conservation. ENDANGERED. Restricted-range species: present in Réunion EBA. Occurs in only two areas, of increasingly degraded habitat, totalling c. 16 km²; number of mature individuals estimated at 240 in 1991, with stable population, and breeding population estimated at 60–160 pairs in 2000. Occupied habitat possibly suboptimal, and the species seems unable to colonize new areas. Poor breeding success or poor survival, and population fragmentation, may prevent it from spreading. Further habitat loss could therefore be catastrophic; threats to its habitat include degradation from tree-felling, agriculture, development for tourism and recreation, and damage by introduced deer. Forest fires a serious threat; poaching, and nest predation by introduced cats and rats (*Rattus*), may be major problems; other threats are hunting, the introduction of alien predators, and natural disasters such as storms and flooding. In 1999, La Roche Ecrite Reserve (38 km²), which encompasses most of this species' range, was being established, and habitat management planned.
Bibliography. Barré (1988), Barré & Barau (1982), Barré *et al.* (1996), Benson (1971b), Berlioz (1946), Cheke (1977, 1987b), Cheke & Jones (1987), Chérel (1988), Chérel *et al.* (1987), Collar & Stuart (1985, 1988), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Green & Hirons (1991), King (1978/79), Milon (1951a), Morgan & Kershaw (1990), Pollen (1866), Probst (1996, 1997, 1998), Sharpe (1879), Sigala & Montet (1997), Simberloff (1995), Stattersfield & Capper (2000), Thiollay & Probst (1999).


ssp rostrata
♂
♀
32
♂
ssp tenuirostris
♀
33
inches 4
cm 10
PLATE 5
ssp heinrothi
♀
♂
ssp timoriensis
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ssp nesiotis
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ssp pelingi
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ssp meyerii
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32. **Blackish Cuckoo-shrike**

Coracina coerulescens

French: Échenilleur noir **German**: Glanzraupenfänger **Spanish**: Oruguero Negruzco
Other common names: Philippine/Black Cuckoo-shrike

Taxonomy. *Ceblepyris coerulescens* Blyth, 1842, Luzon, Philippines.
Cebu race (*altera*) extinct. Two extant subspecies recognized.
Subspecies and Distribution.
C. c. coerulescens (Blyth, 1842) – N Philippines (Luzon, Catanduanes).
C. c. deschauenseei duPont, 1972 – Marinduque, in NC Philippines.



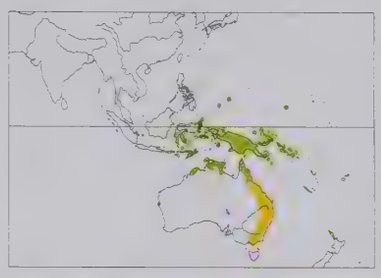
Descriptive notes. 25–26 cm. Male nominate race is entirely purplish-black except for slaty-grey rump; iris dark brown; bill and legs black. Female is all dark ashy grey, paler on rump. Juvenile and immature undescribed. Race *deschauenseei* is slightly less purple than nominate. Voice. Loud, harsh single "peeeeeuuuu", sometimes followed by a rapid series of harsh, almost twittering "peeuu-tip-tip-peeuu-tip-tip" lasting up to 9 seconds; often several individuals call together. Also has harsh, repeated twittering "tip-tip-tip-tip".
Habitat. Forest and secondary growth, usually below 1000 m.
Food and Feeding. Food unrecorded; presumably insects. Occurs in canopy and upper understorey in small groups; sometimes joins mixed-species foraging flocks.
Breeding. Oviduct egg in Mar on Luzon. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Luzon EBA and extinct in Cebu EBA. Reckoned to be generally uncommon and local. Cebu race *altera* extinct; not recorded on the island for many years. Nominate race occurs in Quezon National Park, on Luzon.
Bibliography. Collar & Andrew (1988), Collar *et al.* (1994), Danielsen *et al.* (1994), Delacour & Mayr (1946), Dickinson *et al.* (1991), Gilliard (1950), Goodman & Gonzales (1990), Inskipp *et al.* (1996), Kennedy *et al.* (2000), Mallari *et al.* (2001), Pardo & Gogorza y González (1997), Poulsen (1995), Rabor (1977).

33. **Slender-billed Cicadabird**

Coracina tenuirostris

French: Échenilleur cigale **German**: Mönchsraupenfänger **Spanish**: Oruguero Picofino
Other common names: Common/Long-billed Cicadabird, Jardine Triller/Caterpillar-eater

Taxonomy. *Gracaulus* [*sic*] *tenuirostris* Jardine, 1831, New South Wales, Australia.
Forms a superspecies with *C. dohertyi*, *C. sula*, *C. dispar* and *C. salomonis*; last two formerly treated as conspecific with present species. Races *salvadorii* and *talautensis* of *C. morio* sometimes treated as races of present species, for no valid reason. Micronesian races (*monacha*, *nesiotis* and *insperata*) probably represent a separate species, and other races likely also to involve more than one species; detailed study of taxonomic limits required. Mainland New Guinea race *muellerii* apparently indistinguishable from migratory Australian nominate race, leading to suggestion that all or most populations of former are migrants from Australia and that taxon should be considered synonymous with nominate; further study needed. Racial identity of birds on Lomblen and of those on Seram Laut uncertain, former tentatively included in *timoriensis* and latter in *amboinensis*; similarly, birds in NE Australia (Cape York Peninsula) presumed to belong with *melvillensis*. Thirty subspecies recognized.
Subspecies and Distribution.
C. t. monacha (Hartlaub & Finsch, 1872) – Palau Is.
C. t. nesiotis (Hartlaub & Finsch, 1872) – Caroline Is (Yap).
C. t. insperata (Finsch, 1876) – Caroline Is (Pohnpei).
C. t. pelingi (Hartert, 1917) – Banggai Is (Peleng, Banggai), off E Sulawesi.
C. t. edithae (Stresemann, 1932) – S Sulawesi.
C. t. pererrata (Hartert, 1917) – Tukangbesi Is (Kaledupa, Tomea), off SE Sulawesi.
C. t. emancipata (Hartert, 1896) – Tanahjampea I (between Sulawesi and Flores).
C. t. kalaotuae (Meise, 1929) – Kalaotoa (N of Flores).
C. t. timoriensis (Sharpe, 1878) – Lesser Sundas (Lomblen, Timor).
C. t. grayi (Salvadori, 1879) – N Moluccas (Morotai, Halmahera, Ternate, Tidore, Bacan).
C. t. obiensis (Salvadori, 1878) – C Moluccas (Bisa, Obi).
C. t. amboinensis (Hartlaub, 1865) – S Moluccas (Ambon, Seram, Seram Laut Is).
C. t. nehrkorni (Salvadori, 1890) – Waigeo I, off W New Guinea.
C. t. numforana J. L. Peters & Mayr, 1960 – Numfoor I, in Geelvink Bay (NW New Guinea).
C. t. meyerii (Salvadori, 1878) – Biak I, in Geelvink Bay.
C. t. muellerii (Salvadori, 1876) – W Papuan Is (Kafiau, Misool), New Guinea (except S) and D'Entrecasteaux Archipelago.
C. t. aruensis (Sharpe, 1878) – Aru Is and coastal SW New Guinea (E to R Fly and Daru I).
C. t. admiralitatis (Rothschild & Hartert, 1914) – Admiralty Is.
C. t. matthiae (Sibley, 1946) – N Bismarck Archipelago (Storm I, St Matthias Is).
C. t. remota (Sharpe, 1878) – Bismarck Archipelago (New Ireland, New Hanover, Feni Is).
C. t. ultima Mayr, 1955 – Tabar, Lihir and Tanga Is (off New Ireland).
C. t. heinrothi (Stresemann, 1922) – New Britain.
C. t. rooki (Rothschild & Hartert, 1914) – Umboi I (W of New Britain).
C. t. tagulana (Hartert, 1898) – Louisiade Archipelago (Misima I, Tagula I).
C. t. rostrata (Hartert, 1898) – Rossel I (E Louisiade Archipelago).
C. t. saturatior (Rothschild & Hartert, 1902) – N & C Solomon Is (Buka I, Bougainville I, Choiseul, New Georgia Group, Santa Isabel).
C. t. nisoria (Mayr, 1950) – SC Solomons (Russell Is).
C. t. erythropygia (Sharpe, 1888) – S Solomons (Guadalcanal, Malaita).
C. t. melvillensis Mathews, 1912 – N Australia from Melville I and Kimberley E to Arnhem Land, also NE Queensland (Cape York Peninsula).
C. t. tenuirostris (Jardine, 1831) – E Australia from E Queensland (S of Cape York Peninsula) S to E New South Wales and E Victoria (Melbourne); non-breeding N to SE New Guinea (where possibly also a resident population).



Descriptive notes. 24–27 cm; 54–76 g. A smallish, slender species with relatively long and thin bill. Male nominate race is predominantly dark slaty grey; lores, cheeks and ear-coverts black; median and greater upperwing-coverts black, edged pale grey, remiges black, primary coverts and primaries narrowly edged grey, secondaries and tertials broadly edged grey (whiter on tertials); rectrices black, glossed green at margins and tipped grey, central pair dark ashy grey with black subterminal spot; underparts, including axillaries and underwing-coverts, dark slaty grey, darker on throat; iris dark brown to black; bill blackish-brown; legs blackish. Distinguished from similar congeners, e.g. *C. morio*, *C. incerta*, *C. schisticeps* and *C. boyeri*, by longish, more slender bill, pale edges of secondaries and slaty-grey lesser wing-coverts. Female is very different, distinctive, ashy brown above, greyer on crown, fawn-buff feather edges on rump and uppertail-coverts; creamy-buff supercilium, black eyeline, white-streaked blackish ear-coverts and face side, creamy-buff cheeks, chin and throat; upperwing-coverts brown, edged fawn-buff, greaters edged light rufous, primary coverts dark brown, remiges dark brown with fawn margins, tertials edged rufous; central pair of rectrices olive-brown, remainder dark brown, tipped fawn-buff, outermost with fawn-buff outer web; underparts creamy white to fawn-buff, with narrow blackish bars (except on undertail-coverts), axillaries and underwing-coverts plain fawn-buff. Juvenile is like female, but tertials tipped white, and feathers of upperparts, upperwing-coverts and remiges edged deep rufous, supercilium rufous, underparts deeper fawn, throat barred; immature differs from adult female in browner crown, brownish bill and legs. Racial variation complex, involving mainly size (including bill), extent of black on head of male, and upperpart colour and occurrence of barring on female: *monacha* female has brownish upperparts, buff underparts with irregular rufous tinge and heavily barred dark brown; *nesiotis* is much larger than previous, female more rufous above and below, barring confined to breast sides; *insperata* female is distinctive, head slate-grey, back grey-brown, wings and tail black with rufous edges, rest of plumage rufous-cinnamon, unbarred, immature entirely rufous-cinnamon with heavy pale buff and black bars above and below; *pelingi* female is unbarred rich cinnamon below; *edithae* female has brown back, is buffy with blackish barring below; *pererrata* female is greyish-brown above, buff and sparsely barred below; *kalaotuae* is like previous but greyer on back; *emancipata* is very large, female light slaty grey above, white with some black barring below; *timoriensis* is rather light in overall colour, with dusky face and throat, female has light grey back and fully blackish-barred white underparts; *grayi* female has olive-brown back, rusty-buff underparts with strong blackish barring; *obiensis* female is reddish olive-brown to tawny-rufous above, unbarred rich cinnamon below; *amboinensis* female is relatively grey above, buff underparts with relatively sparse black barring; *nehrkorni* male has black ear-coverts, chin and throat; *numforana* is rather small, female with little or no barring below; *meyerii* male is dark grey on upperparts, black from chin to breast, female has underparts deep buff to rust-coloured with reduced barring; *aruensis* is very small; *muellerii* is similar to previous but wing longer; *tagulana* is also similar but bill larger; *remota* female is unbarred below; *ultima* female is similarly unbarred below; *rooki* male has black on lores and ear-coverts, very dark throat, female has olive-brown back and pale rust-coloured underparts barred only on undertail-coverts; *heinrothi* resembles previous, but larger, female more barred; *admiralitatis* is very like last two, but smaller than either; *matthiae* is larger and paler than previous, female barred below; *rostrata* has large sharply hooked bill, female deep buff to rust-coloured below and barred black on sides of neck and breast; *saturatior* female has upperparts reddish olive-brown to tawny-rufous, unbarred below; *nisoria* female is barred below (the only Solomons race with barred underparts); *erythropygia* female is unbarred below; *melvillensis* male has black on face not extending to throat, female is mid greyish-fawn above, creamy white with heavy dusky barring below. Voice. In Australia and S New Guinea has staccato buzzing "kree", repeated 8–35 or more times, reminiscent of sound made by cicada (Cicadidae); loud ringing "cree cree" in NE Queensland (*melvillensis*). In Palau Is (*monacha*) a quiet, upslurred whistle, variable, sometimes louder and repeated in song-like fashion. In E Caroline Is (*insperata*) cat-like whistles and low churrs, rolling "preeer" and short "chip-chip-breer". In Admiralty Is (*admiralitatis*) a repeated downslurred "seeu". Other calls (not necessarily by all races) include soft, explosive "twik", and rapid, slightly rolling "chuit" as contact.
Habitat. Tropical and temperate forests, including rainforest, monsoon forest, deciduous vine forest and eucalypt (*Eucalyptus*) forest; also secondary forest, selectively logged forest and forest edge, scrub, open tall woodland, paperbark (*Melaleuca*) swamps, savanna and mangroves. Migrants in New Guinea more or less confined to forest edge, secondary growth, savanna and mangroves, absent from forest interior except on islands. Lowlands and hills, to c. 1500 m.
Food and Feeding. Eats mainly insects, including caterpillars (Lepidoptera), adult and larval beetles (Coleoptera), grasshoppers (Tettigoniidae, Acrididae), crickets (Gryllidae), cicadas (Cicadidae) and ants (Formicidae); sometimes takes fruit and seeds. Found singly or in pairs. Rather unobtrusive; keeps high in trees, gleaning and snatching items from leaves, twigs and bark in tree crowns; rarely at lower levels.
Breeding. Breeds Sept–Mar/Apr in Australia; fledgling in Nov in Admiralty Is (Manus), indicating breeding in Oct. Nest built by both sexes, a very small, shallow bowl of small twigs, dry grass, bark, casuarina (*Casuarina*) needles, lichens and stems, bound with cobwebs and camouflaged on outside with lichen and moss, placed 10–25 m up on fork of horizontal tree branch. Eggs 1; incubation by female only, period 22 days; chick brooded by female, fed by both parents, fledging period 27 days.
Movements. Resident in most of range. In E Australia, S part of population migratory, moving S in Aug–Oct to breed, and with general return movement N in austral winter, from Mar (sometimes Jan); some individuals cross Torres Strait to reach SE New Guinea in non-breeding season.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Generally local and uncommon in Australia, and now only a vagrant at S limit of range (Melbourne area); recorded densities of 0·08–0·5 birds/ha. Uncommon over much of New Guinea, and rare in higher parts of its altitudinal range, but fairly common in S Trans-Fly region and on some islands. Generally uncommon in Wallacea, but moderately common on Halmahera; in S Sulawesi known from only one specimen, collected in 1931. Uncommon but widespread in Solomons Is. In Micronesia (in

On following page: 34. Sumba Cicadabird (*Coracina dohertyi*); 35. Sula Cicadabird (*Coracina sula*); 36. Kai Cicadabird (*Coracina dispar*); 37. San Cristobal Cicadabird (*Coracina salomonis*).

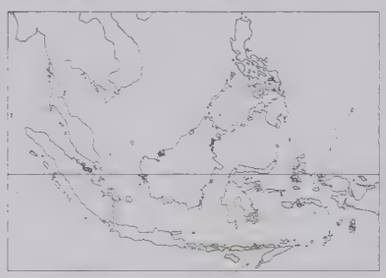
1980s), was uncommon but widespread on Palau, and uncommon in Carolines (rare on Yap). As this species prefers mature forest or older regrowth, it is sensitive to logging in some forest types.
Bibliography. Beehler *et al.* (1986), Beruldsen (1980), Blakers *et al.* (1984), Bowie (1980), Coates (1990, 2001), Coates & Bishop (1997), Cooper (1978), Diamond (2002), Dickinson & Dekker (2002a), Doughty *et al.* (1999), Galbraith & Galbraith (1962), Garnett (1993), Higgins *et al.* (2005), Isherwood *et al.* (1997), Kaestner (1987), Keast (1958), Marchant (1979, 1984, 1985b), Mayr (1955), Mayr & Rand (1937), Mees (1982), Noske *et al.* (1997), Pizzey (1980), Pratt *et al.* (1980), Rand & Gilliard (1967), Schodde & Mason (1999), Strange (2001), White & Bruce (1986).

34. Sumba Cicadabird

Coracina dohertyi

French: Échenilleur de Sumba **German**: Sumbaraupenfänger **Spanish**: Oruguero de Sumba
Other common names: Sumba/Black-barred Cuckoo-shrike, Black-barred Cicadabird

Taxonomy. *Edoliosoma dohertyi* Hartert, 1896, Sumba.
Sometimes retained in the genus *Edoliosoma*. Forms a superspecies with *C. tenuirostris*, *C. sula*, *C. dispar* and *C. salomonis*. Sumbawa population may merit recognition as a distinct race. Monotypic.
Distribution. W Lesser Sunda Is (Sumbawa, Flores, Sumba).



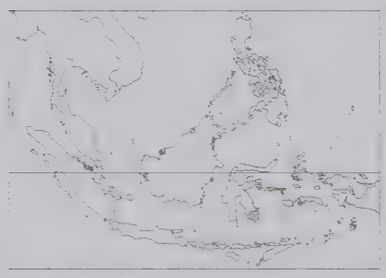
Descriptive notes. 20–24 cm. Male is light bluish-slate above, darker on head and neck; forehead, lores, orbital region, side of head, ear-coverts, chin and throat black; upperwing-coverts light grey; primaries and primary coverts black, inner primaries tipped grey-white, secondaries and tertials black with pale grey margins and greyish-white inner webs; rectrices black, tipped grey, central pair dark grey with black subterminal band and grey tip; underparts, axillaries and underwing-coverts dark grey; iris dark brown, bill black, legs dark grey to blackish. Distinguished from *C. tenuirostris* (of race *emancipata*) by darker edges of upperwing-coverts and secondaries, and black forehead, face and throat. Female differs from male in having white flecks on ear-coverts, more white on edges of secondaries and upperwing-coverts, and white underside with dusky grey barring. Juvenile and immature undescribed. Voice. Harsh call, also described as a pleasant, rasping "queep"; song 3 grating notes, rather like rasp of a cicada (Cicadidae).
Habitat. Primary and tall secondary evergreen forest, monsoon forest and casuarina (*Casuarina*) woodland, from 200 m to 1700 m.
Food and Feeding. Presumably insectivorous. Forages in middle storey and lower canopy of large trees.
Breeding. Breeding condition in Jun. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Northern Nusa Tenggara EBA and Sumba EBA. Generally uncommon. Locally moderately common at 800–1100 m on Sumbawa and Flores.
Bibliography. Andrew (1992), Coates & Bishop (1997), Collar & Andrew (1988), Collar *et al.* (1994), Galbraith & Galbraith (1962), Inskipp *et al.* (1996), Jepson & Monk (1995), Johnstone *et al.* (1996), Jones, Juhaeni *et al.* (1994), Jones, Linsley & Marsden (1995), Mayr (1944), Paynter (1963), Rensch (1931), Strange (2001), Sujatnika *et al.* (1995), White & Bruce (1986).

35. Sula Cicadabird

Coracina sula

French: Échenilleur des Sula **German**: Sularaupenfänger **Spanish**: Oruguero de Sula

Taxonomy. *Edolisoma mindanense sula* Hartert, 1917, Sulabesi, Sula Islands.
Forms a superspecies with *C. tenuirostris*, *C. dohertyi*, *C. dispar* and *C. salomonis*; possibly most closely related to race *pelingi* of *C. teniurostris*. Has sometimes been treated as a race of *C. morio*. Monotypic.
Distribution. Sula Is (Taliabu, Seho, Mangola, Sanana), off E Sulawesi.



Descriptive notes. 20–24 cm. A long-tailed campephagid exhibiting extreme type of sexual convergence, with female plumage almost wholly masculinized. Male is slaty-grey, except for black lores and face, dusky chin and throat. Distinguished from very similar *C. tenuirostris* by somewhat longer tail. Female is very like male, but slightly paler below, and has no black on head. Juvenile reddish-brown but not fully described; immature undescribed. Voice. A series of short, rather explosive, metallic notes at rate of 2–3 per second.
Habitat. Forest , woodland, scrub and plantations, from lowlands to 1400 m.
Food and Feeding. Eats insects, including caterpillars, also small fruits. Frequents mainly lower storeys of forest, up to c. 15 m above ground. Sometimes sallies for insects. Often joins mixed-species foraging flocks.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Banggai and Sula Islands EBA. On Taliabu, common in all lowland wooded habitats, uncommon in primary montane forest to 800 m. Moderately common on Mangola, less so on Sanana.
Bibliography. Andrew (1992), Coates & Bishop (1997), Collar & Andrew (1988), Davidson *et al.* (1995), Dickinson & Dekker (2002a), Dickinson *et al.* (2002a), Holmes & Phillipps (1996), Inskipp *et al.* (1996), Sujatnika *et al.* (1995), White & Bruce (1986).

36. Kai Cicadabird

Coracina dispar

French: Échenilleur des Kaï **German**: Keiraupenfänger **Spanish**: Oruguero de las Kai

Taxonomy. *Edoliosoma dispar* Salvadori, 1878, Kei Bandan, Kai Islands.
Sometimes retained in the genus *Edoliosoma*. Forms a superspecies with *C. tenuirostris*, *C. dohertyi*, *C. sula* and *C. salomonis*. Has been regarded as conspecific with first of those; two individuals of present taxon collected in Seram Laut (Maar I) together with immature male evidently of *C. tenuirostris* (possibly of race *amboinensis*), although identity of latter questionable; considered better to treat present taxon as a separate species, pending resolution of the question of apparent sympatry on Maar. Monotypic.
Distribution. Seram Laut Is (Gorong, Manawoka, Maar, Panjang), Banda Is, Watubela Is (Tiur), Tayandu Is (Manggur), Kai Is, and E Lesser Sundas (Romang, Damar, Tanimbar).



Descriptive notes. 21·5–24·5 cm. Male is glossy black above and below, with bottle-green reflections; iris rather dark brown, bill blackish, and legs black. Differs from *C. tenuirostris* in blacker coloration. Female is olive-brown above, greyer on head, with darker ear-coverts and rufous-buff cheeks, more rufous-brown on upperwing-coverts, dark brown remiges edged rufous, dark brown tail tipped rufous, rufous-buff underparts with dusky blackish cross-lines, bars narrower on undertail-coverts. No information on juvenile and immature plumages. Voice. Male has repeated, unmusical downslurred note; also gives single "chuk".
Habitat. Forest, forest edge and secondary woodland, from lowlands to 1400 m.
Food and Feeding. Presumably eats insects. Forages mainly in middle storey to lower canopy; gleans from undersides of leaves.
Breeding. No information.
Movements. None reported.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Banda Sea Islands EBA. Poorly known. Apparently generally uncommon, but easily overlooked; may be locally numerous. Condition of this species' habitat and any potential threats on some of the islands on which it occurs are entirely unknown.
Bibliography. Andrew (1992), Coates & Bishop (1997), Collar & Andrew (1988), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Dickinson & Dekker (2002a), Hartert (1903), Inskipp *et al.* (1996), Michaux (1996), Stattersfield & Capper (2000), Sujatnika *et al.* (1995), White & Bruce (1986).

37. San Cristobal Cicadabird

Coracina salomonis

French: Échenilleur de San Cristobal **Spanish**: Oruguero de San Cristóbal
German: San Cristobal-Raupenfänger
Other common names: Makira/San Cristobal Cuckoo-shrike

Taxonomy. *Edoliisoma salomonis* Tristram, 1879, San Cristobal Island, Solomon Islands.
Forms a superspecies with *C. tenuirostris*, *C. dohertyi*, *C. sula* and *C. dispar*; formerly treated as conspecific with first-mentioned. Monotypic.
Distribution. San Cristobal (Makira), in Solomon Is.



Descriptive notes. 26 cm; male 55–75 g, female 61–73 g. Male is grey overall, except for black lores, grey-edged black primary coverts and remiges, entirely black tail; iris very dark brown; bill and legs black. Differs from *C. tenuirostris* in paler coloration. Female has upperparts as male, but lores dark grey, outermost rectrices broadly tipped rufous; entire underparts rich tawny-rufous with no barring. Juvenile has dark grey crown with black and whitish-buff bars, upperparts as female but with black, white and rufous bars on mantle and uppertail-coverts, paler below than female, feathers with blackish shaft streaks and whitish tips, eye dark grey-brown, lower mandible greyish, legs grey; immature like female, but juvenile remiges and rectrices retained. Voice. Song a slightly decelerating series of 7–14 upslurred or downslurred nasal whistles; loud disyllabic calls, "chi-beet" or "pity-you", also loud chatters.
Habitat. Inhabits forest and secondary forest, but uncommon in secondary scrub; recorded up to at least 900 m.
Food and Feeding. No information on diet. Forages in twos or threes in dense foliage, sometimes with mixed flocks, especially with drongos (*Dicrurus*).
Breeding. No information.
Movements. No information.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Solomon Group EBA. Fairly common within its single-island range.
Bibliography. Dutson (2005a), Galbraith & Galbraith (1962), Mayr (1955, 1978).

PLATE 6 ➤



PLATE 6

inches 4

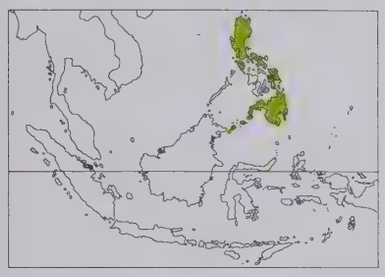
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38. Black-bibbed Cicadabird

Coracina mindanensis

French: Échenilleur à menton noir **Spanish**: Oruguero Filipino
German: Philippinenraupenfänger
Other common names: Black-bibbed Cuckoo-shrike, Philippine Cicadabird

Taxonomy. *Volvocivora mindanensis* Tweeddale, 1879, Zamboanga, Mindanao, Philippines.
Forms a superspecies with *C. morio*, *C. ceramensis* and *C. incerta*, and all sometimes considered conspecific. Five subspecies recognized.
Subspecies and Distribution.
C. m. lecroyae Parkes, 1971 – Luzon, in N Philippines.
C. m. elusa (McGregor, 1905) – Mindoro.
C. m. ripleyi Parkes, 1971 – Samar, Biliran, Leyte and Bohol.
C. m. mindanensis (Tweeddale, 1879) – Mindanao and Basilan.
C. m. everetti (Sharpe, 1893) – Sula Archipelago (Jolo, Lapac, Tawi-Tawi, Bongao), in SW Philippines.



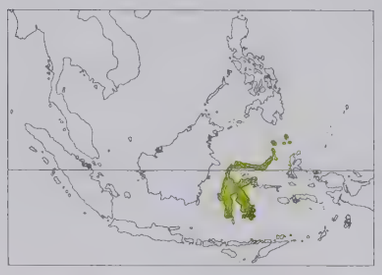
Descriptive notes. 23 cm. Male nominate race has forehead, side of face, chin, throat and foreneck black; crown and upperparts, including upperwing-coverts, light slaty blue, lighter on rump and very pale on uppertail-coverts, latter edged whitish; greater coverts and tertials externally pale grey; alula and primary coverts black, primaries and secondaries black, edged and tipped slaty grey; rectrices black, edged grey at tip; black of lower foreneck shades to light slaty blue on underparts, including underwing-coverts and axillaries, becoming pale ashy grey on lower belly to undertail-coverts; iris dark brown; bill and legs black. Differs from *C. striata* in smaller size, black face and throat. Female has no black on head but dusky spot in front of eye; paler blue-grey above than male, becoming silvery grey from lower back to uppertail-coverts; edges of greater coverts, secondaries and tertials lighter grey than back, tail mainly black but ashy grey at base; underparts plain ashy grey, whiter on lower abdomen and undertail-coverts, with light pearl-grey underwing-coverts and axillaries. Juvenile and immature undescribed. Races differ in size and in shade of grey areas: *ripleyi* is closest to nominate, but wing and tail on average longer, male grey areas paler, rump paler than back (but not so pale as nominate), female rump usually pale grey (rather than whitish) and lower underparts light grey (not white), both sexes with terminal black band on central rectrices narrower; *elusa* darker and more uniform, showing less contrast in plumage, rump only slightly paler than back, wing edgings concolorous with body; *everetti* is extremely similar to previous, differing only in smaller size; *lecroyae* is also similar, but wing and, especially, tail shorter, plumage generally somewhat paler grey, edges of wing-coverts and remiges much paler (even whitish in female). Voice. Insufficient information.
Habitat. Forest, secondary growth; mostly at lower elevations, below 1000 m.
Food and Feeding. Food not recorded; presumably insects. Occurs singly, in small groups or with mixed-species flocks; inconspicuous and quiet, keeping to canopy.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Poorly known. Uncommon to rare; possibly overlooked. Considered very rare on Luzon (race *lecroyae*); was not common in mid-1950s on Mindoro (*elusa*); locally fairly common on Mindanao (nominate); no information on status of *everetti* in Sula Is. Race *ripleyi* rare on Samar and Bohol, presumably also on Biliran and Leyte; very occasionally recorded in Rajah Sikatuna National Park (Bohol). This species' preference for lower-altitude forest suggests that it must have suffered population declines, possibly on a fairly large scale, following the widespread destruction of lowland forest throughout the Philippines.
Bibliography. Anon. (1997b), Brooks, Dutson, King & Magsalay (1996), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Delacour & Mayr (1946), Dickinson & Dekker (2002a), Dickinson *et al.* (1991), duPont & Rabor (1973a), Dutson *et al.* (1992), Gilliard (1950), Inskipp *et al.* (1996), Kennedy *et al.* (2000), Mallari *et al.* (2001), Pardo & Gogorza y González (1997), Parkes (1971), Rand & Rabor (1960), Ripley & Rabor (1958), Stattersfield & Capper (2000), White & Bruce (1986).

39. Sulawesi Cicadabird

Coracina morio

French: Échenilleur morio **German**: Morioraupenfänger **Spanish**: Oruguero de Célebes
Other common names: Sulawesi Cuckoo-shrike, Celebes/Mueller's/Dark-grey Cicadabird

Taxonomy. *Ceblepyris morio* S. Müller, 1843, near Gorontalo and Tondano, north Sulawesi.
Forms a superspecies with *C. mindanensis*, *C. ceramensis* and *C. incerta*, and all sometimes considered conspecific. *C. sula* has sometimes been treated as a race of present species. Races *salvadorii* and *talautensis* sometimes included in *C. tenuirostris*, for no apparent valid reason. Nominate race varies clinally, with size of male's black throat patch decreasing and paleness of female plumage increasing from N to S; birds from S Sulawesi often separated as race *wiglesworthi*, but populations with intermediate characters occur in parts of C & SE Sulawesi. Three subspecies currently recognized.
Subspecies and Distribution.
C. m. salvadorii (Sharpe, 1878) – Sangihe Is.
C. m. talautensis (A. B. Meyer & Wiglesworth, 1895) – Talaud Is (Karakelong, Salebabu, Kaburuang).
C. m. morio (S. Müller, 1843) – N, C, S & SE Sulawesi, including smaller islands of Lembeh, Tobea, Kabaena, Muna, Buton.
Descriptive notes. 23–25 cm; 50–67 g. Male nominate race is dark bluish-slate overall, darker on head, with lores, face, chin, throat and upper breast black (throat patch largest in N of range); median and greater upperwing-coverts grey, margined paler, alula black, primary coverts and remiges



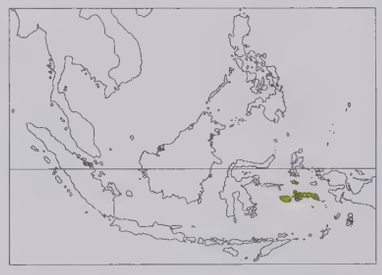
black, edged grey to blue-grey; rectrices black, tipped white, central pair grey with black tips; underwing-coverts and axillaries dark bluish-slate; iris dark brown; bill and legs black. Female is paler grey above (palest in S) than male, no black on head, throat or breast, has lores white, eyering buffy white, blackish spot in front of eye, grey head side mottled white; most of underparts, including axillaries and also underwing-coverts, cinnamon or deep ochraceous, barred black. Juvenile and immature undescribed. Race *salvadorii* is largest, male more smoky grey than nominate, including on throat, female buffy white below; *talautensis* is intermediate in size, female underparts pale buffy and more closely barred. Voice. Song of male a slow sequence of buzzy, nasal, ringing notes, like sound made by cicada (Cicadidae), alternating with clear, descending whistle. Also gives bursts of excited, piercing "ki" or "ke" calls, rapid, nasal chatter, and low-pitched nasal "chup".
Habitat. Primary and tall secondary lowland, hill and montane forest, forest edge, small forest patches and secondary growth; to 1770 m on Sulawesi.
Food and Feeding. Eats insects. Occurs in pairs or small groups, also in mixed-species foraging flocks. Gleans quietly but actively in canopy and subcanopy.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Widespread, and locally moderately common, on Sulawesi. Common on Talaud Is; uncommon on Sangihe. Occurs in Lore Lindu National Park, on Sulawesi.
Bibliography. Andrew (1992), Baltzer (1990), Catterall (1997), Coates & Bishop (1997), Coles (1976), Dickinson & Dekker (2002a), Holmes & Phillipps (1996), Inskipp *et al.* (1996), Michaux (1998), Parkes (1971), Rabor (1977), Riley (1997a), Stresemann (1938, 1940), Wardill (1995), Watling (1983a), White & Bruce (1986).

40. Pale Cicadabird

Coracina ceramensis

French: Échenilleur pâle **German**: Blassraupenfänger **Spanish**: Oruguero Pálido
Other common names: Moluccan/Pale-grey Cicadabird

Taxonomy. *G[raucalus] ceramensis* Bonaparte, 1850, Seram, Moluccas.
Forms a superspecies with *C. mindanensis*, *C. morio* and *C. incerta*, and all sometimes considered conspecific. Validity of race *hoogerwerfei* uncertain; further study needed. Proposed race *marginata* (from Buru and Boano) considered indistinguishable from nominate. Two subspecies currently recognized.
Subspecies and Distribution.
C. c. hoogerwerfei (Jany, 1955) – Obi I, in Moluccas.
C. c. ceramensis (Bonaparte, 1850) – Buru, Seram and Boano I.



Descriptive notes. 24–25 cm. Male nominate race is light slaty grey above, with lores black; upperwing-coverts black, outer webs lighter slaty grey than upperparts, greater coverts edged white; alula black, primary coverts black, edged grey; remiges black, primaries edged grey, secondaries edged whitish; rectrices black, ashy grey at tip, central two feathers light slaty grey with black subterminal spot; chin blackish; slaty grey below, darker on throat, lighter on underwing-coverts; iris dark brown, bill blackish, legs black. Differs from *C. tenuirostris* (e.g. of race *amboinensis*) in smaller size, paler underparts. Female resembles male, but much paler below, with throat and undertail-coverts almost whitish. Juvenile is paler than female, with sparse black shaft streaking on breast and flanks; immature not fully described. Race *hoogerwerfei* is said to be purer grey dorsally and paler below than nominate. Voice. Rapid dry chatter and a short "tick"; flight call a distinctive nasal chatter.
Habitat. Forest, including selectively logged forest, secondary growth and occasionally mangroves; sea-level to 1750 m.
Food and Feeding. Takes insects. Usually found with mixed-species foraging flocks in densely foliaged crowns of tall trees; forages actively, gleaning from branches and from undersides of leaves.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Buru EBA, Seram EBA and Northern Maluku EBA. Not well known. Moderately common on Buru and Seram; apparently very uncommon on Obi.
Bibliography. Andrew (1992), Bowler & Taylor (1989), Coates & Bishop (1997), Dickinson & Dekker (2002a), Dickinson *et al.* (2002a), Hartert (1903), Inskipp *et al.* (1996), Isherwood *et al.* (1997), Michaux (1998), Sujatnika *et al.* (1995), White & Bruce (1986).

41. Black-shouldered Cicadabird

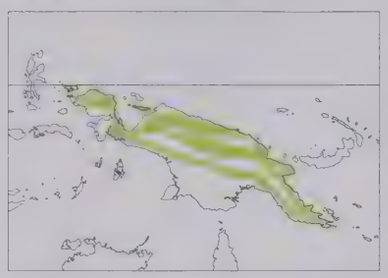
Coracina incerta

French: Échenilleur à épaulettes noires **Spanish**: Oruguero Incierto
German: Schwarzschulter-Raupenfänger
Other common names: Black-shouldered Cuckoo-shrike, Papuan/Sharpe's Cicadabird

Taxonomy. *Campephaga incerta* A. B. Meyer, 1874, Ansus, Yapen Island, north-west New Guinea.
Forms a superspecies with *C. mindanensis*, *C. morio* and *C. ceramensis*, and all sometimes considered conspecific. Monotypic.

On following page: 42. Grey-headed Cuckoo-shrike (*Coracina schisticeps*); 43. New Guinea Cuckoo-shrike (*Coracina melas*).

Distribution. W Papuan Is (Waigeo, Batanta), mountains throughout New Guinea, and islands in Geelvink Bay (Meos Num I, Yapen I).



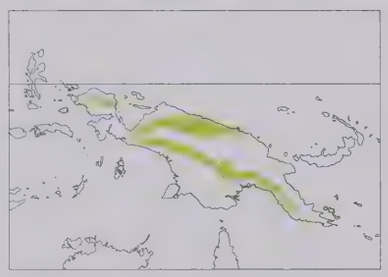
Descriptive notes. 21–22 cm; 53–60 g. Male is slaty blue above, with lores, chin and feathers under eye black, ear-coverts and throat tinged blackish; upperwing-coverts, alula and remiges black, median and greater coverts and secondaries edged slaty blue; tail black, tipped ashy grey, outermost feather with ash-grey outer web, central two feathers ashy grey with subterminal black spot; entire underparts slaty blue, underwing-coverts and axillaries ashy grey; iris dark brown; bill and legs black. Differs from similar *C. tenuirostris* in smaller size, shorter bill, dark "shoulder". Female is very like male but paler, axillaries and underwing-coverts barred grey and white, lacks black spot on central rectrices. Juvenile undescribed; immature like female, but ear-coverts, chin and throat streaked or flecked whitish, axillaries almost white, barred grey, lower abdomen indistinctly barred pale grey. Voice. Song a series of 5–30 disyllabic, buzzy notes like sound of a cicada (Cicadidae), "weeyu-weeyu-weeyu" and so on; also has whistled "chewit" contact call.
Habitat. Hill forest and lower montane forest, forest edge and secondary growth, at 100–1800 m, usually 450–1450 m.
Food and Feeding. Eats arthropods, including caterpillars and katydids (Tettigoniidae); also fruit. Forages in upper tree levels; perches on branches in outer canopy and peers at overhead foliage; occasionally hover-gleans.
Breeding. Females in breeding condition in Oct–Nov. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Widely distributed but local; fairly common to scarce. Poorly known species.
Bibliography. Andrew (1992), Beehler (1978a), Beehler *et al.* (1986), Coates (1990), Diamond, J.M. (1972, 1985), Gilliard & LeCroy (1961), Gregory (1995), Mayr & Rand (1937), Rand & Gilliard (1967), Ripley (1964), Rothschild (1916).

42. Grey-headed Cuckoo-shrike

Coracina schisticeps

French: Échenilleur de Gray **German**: Grayraupenfänger **Spanish**: Oruguero Cabecigrís
Other common names: Gray's/New Guinea/Slaty/Black-tipped Cuckoo-shrike

Taxonomy. *Campephaga schisticeps* G. R. Gray, 1846, Triton Bay, south-west New Guinea.
Four subspecies recognized.
Subspecies and Distribution.
C. s. schisticeps (G. R. Gray, 1846) – Misool I and NW New Guinea (E to head of Geelvink Bay and Etna Bay; possibly also W Papuan Is (Waigeo, Batanta).
C. s. reichenowi (Neumann, 1917) – N New Guinea from Geelvink Bay E to Sepik Valley.
C. s. poliopsa (Sharpe, 1882) – S New Guinea from R Kaspare E to Astrolabe Mts.
C. s. vittata (Rothschild & Hartert, 1914) – D'Entrecasteaux Archipelago (Goodenough I, Ferguson I).



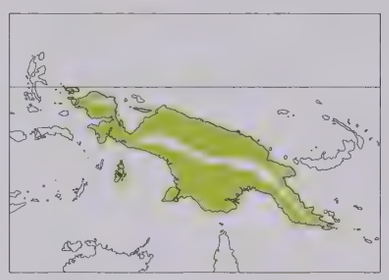
Descriptive notes. 21–22 cm; 48–57 g. Male nominate race has crown and upperparts, including lesser and median upperwing-coverts, slaty grey, side of head darker grey, feathers in front of eye, cheeks and chin blackish; greater coverts paler grey; alula, primary coverts and primaries black; secondaries and tertials black, broadly edged grey; tail black, tipped ashy grey, central two feathers dark ashy grey with subterminal black band; underparts slaty grey, axillaries and underwing-coverts slaty grey; iris dark brown; bill and legs black. Distinguished from very similar *C. tenuirostris* by smaller size, shorter bill, less distinct paler edges of secondaries; from *C. morio* by lack of black "shoulder". Female has crown to nape slaty grey, feathers in front of eye blackish, head side rufous, upperparts rufous-brown, more chestnut on rump and uppertail-coverts, flight-feathers blackish-brown, broadly edged rufous-brown on secondaries and tertials, tail black, tipped rufous-buff, central two feathers rufous-brown with black tips; cheeks and entire underparts, including axillaries and underwing-coverts, bright chestnut. Juvenile undescribed; immature like female, subadult male a mixture of grey and rufous. Race *reichenowi* has blacker chin than nominate, female has rufous crown and nape; *poliopsa* female similar to nominate female, but slate-grey extends down from crown to ear-coverts and chin; *vittata* female has slate-grey ear-coverts and chin, black ventral barring. Voice. Vocal and conspicuous. Male has musical "chickity-choo", female answers with nasal upslurred "weeh weeh"; also has rapid nasal slurs followed by chattering.
Habitat. Forest, forest edges and tall secondary growth; sea-level to 1500 m, mainly 150–1200 m.
Food and Feeding. Eats mainly fruit; also insects, including caterpillars. Gregarious and vocal; forages mainly in canopy, occasionally in middle level.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Status poorly known. Regarded as locally common.
Bibliography. Andrew (1992), Beehler *et al.* (1986), Coates (1990), Diamond, J.M. (1972, 1985), Diamond, J.M. & Terborgh (1968), Gregory (1995), Mees (1965), Rand & Gilliard (1967), Ripley (1964).

43. New Guinea Cuckoo-shrike

Coracina melas

French: Échenilleur mélanure **German**: Stahlraupenfänger **Spanish**: Oruguero Negro
Other common names: (New Guinea) Black Cuckoo-shrike/Greybird

Taxonomy. *Lanius melas* Lesson, 1828, Dorey, north-west New Guinea.
Race *batantae* often merged with nominate. Species name often incorrectly given as *melaena*, but original name is a transliterated Greek word and thus remains invariable. Six subspecies currently recognized.
Subspecies and Distribution.
C. m. waigeuensis (Stresemann & Paludan, 1932) – Waigeo I, off NW New Guinea.
C. m. batantae (Gyldenstolpe & Mayr, 1955) – Batanta I (W Papuan Is).
C. m. melas (Lesson, 1828) – Salawati I (W Papuan Is) and N & W New Guinea (E to Astrolabe Bay and, in S, to R Eilanden).
C. m. tommasonis (Rothschild & Hartert, 1903) – Yapen I, in Geelvink Bay.
C. m. meeki (Rothschild & Hartert, 1903) – E New Guinea (E from Huon Gulf and R Fly).
C. m. goodsoni (Mathews, 1928) – Aru Is.



Descriptive notes. 23 cm; 56–63 g. Male nominate race is entirely black with purplish gloss; iris dark brown; bill and legs black. Female is bright rufous-brown, darker on upperparts, with ear-coverts and cheeks even darker, streaked pale, lores black, pale ochraceous stripe over eye, duller brown upperwing-coverts and remiges. Juvenile undescribed; immature like female, and subadult male mottled black and rufous. Races differ mainly in overall shade and richness of colour of female plumage, especially underparts: *meeki* is palest; *goodsoni* and *waigeuensis* are darkest, female of latter also has barring on flanks; *tommasonis* is brightest; *batantae* similar to *waigeuensis*, but female apparently lacks barring. Voice. A loud, slow series of liquid, downslurred whistling notes, "deer" or "tieeuw"; flock call a nasal, rapidly repeated "whit"; also has nasal "wutchay", sometimes repeated in chattering series.
Habitat. Rainforest and monsoon forest; locally also gallery and mangrove forests; normally in forest interior, but visits edges and adjacent secondary growth, disturbed areas and teak (*Tectona*) plantations. Mainly lowlands to 750 m, locally to 1250 m.
Food and Feeding. Feeds mainly on adult and larval insects, including lepidopteran larvae; also takes fruit. Usually in pairs or in parties of up to ten individuals, foraging quietly in subcanopy and in smaller branches of lower trees; also commonly joins mixed-species foraging flocks in middle storey. Active, moving quickly from perch to perch, gleaning from branches and leaves; occasionally sallies.
Breeding. Nest-building in Nov. One nest was built by both adults, described as typical of genus, placed 27 m up and near outer foliage on sturdy horizontal fork of branch. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Widespread on mainland, where common in lowlands but uncommon to rare at higher elevations; no information on status of island populations. Density in rainforest estimated at 6 birds/10 ha.
Bibliography. Andrew (1992), Beehler (1978a), Beehler *et al.* (1986), Bell (1982b), Coates (1990), David & Gosselin (2002a), Diamond (1972, 1987), Gregory (1995), Mack *et al.* (2000), Mathews (1928), Mayr & Rand (1937), Rand & Gilliard (1967), Ripley (1964), Sibley & Monroe (1990).

PLATE 7 ➤

PLATE 7

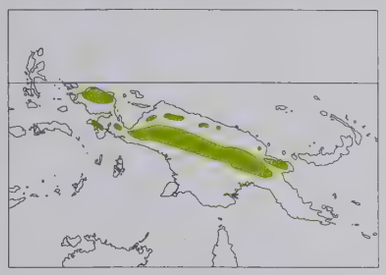

inches 4
cm 10
ssp tricolor
♂
46
45
44
♂
♀
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ssp holopolia
♀
♂
47
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48
ssp polioptera
♂
♀
ssp jabouillei
♂
♀
50
♂
ssp fimbriata
♀
ssp neglecta
♂
♀
ssp melaschistos
♂
♀
ssp saturata
♂
♀
49
♂
ssp melanoptera
♀
51
♂
ssp sykesi

44. Black-bellied Cuckoo-shrike

Coracina montana

French: Échenilleur à ventre noir **German**: Bergraupenfänger **Spanish**: Oruguero Ventrinegro
Other common names: Mountain Cuckoo-shrike, Black-bellied Greybird

Taxonomy. *Campephaga montona* [*sic*] Meyer, 1874, Arfak Mountains, New Guinea.
Two subspecies recognized.
Subspecies and Distribution.
C. m. montana (Meyer, 1874) – mountains of W & C New Guinea (Vogelkop and C range).
C. m. bicinia Diamond, 1969 – mountains of N New Guinea (Cyclops, Bewani and Torricelli).



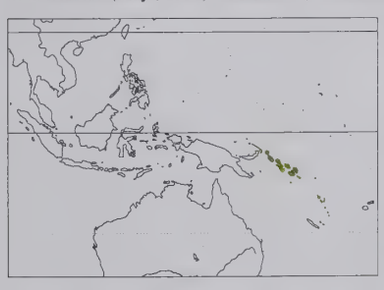
Descriptive notes. 24 cm; 57–70 g. Male nominate race has blue-grey crown and upperparts, including most of upperwing-coverts, black greater coverts broadly edged grey; alula and flight-feathers deep glossy black, tertials edged grey; rectrices black, glossed green at edges; forehead, lores, side of face, neck side, throat and entire underparts, including underwing-coverts and axillaries, glossy black, thighs grey; iris dark brown; bill and legs grey to blackish. Differs from extremely similar *C. holopolia* in having pale grey edging restricted to tertials. Female is like male, but paler blue-grey above and below, has only base of forehead, lores and chin black. Juvenile apparently has rufous undertail-coverts, barred dark slaty grey; immature like female, but tertials and outer rectrices tipped white, chin and throat grey, variable fine barring on head, breast and undertail-coverts (may be absent). Race *bicinia* is larger than nominate, black of chin and throat more extensive. Voice. Vocal; has conspicuous antiphonal duet, male giving a rising and falling, nasal, whistled note, female responding with 2–3 rapid, buzzy, downslurred notes; duet repeated for 8–10 seconds. Often calls in flight.
Habitat. Forest, forest edges (not secondary growth), clearings and gardens; mountains at 750–2800 m, mainly 1000–2450 m.
Food and Feeding. Eats fruit, including figs (*Ficus*); also insects, including caterpillars. Usually in pairs or in parties of 3–4 individuals. Forages in canopy, occasionally lower, continually moving and calling; flutters among and under small leaves when seeking insects.
Breeding. Laying female in Oct and dependent fledgling in Sept indicate breeding in late dry season to early wet season. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Generally fairly common. Little recent information.
Bibliography. Andrew (1992), Beehler (1978a), Beehler *et al.* (1986), Coates (1990), Diamond (1969, 1972), Diamond & Terborgh (1968), Gilliard & LeCroy (1961), Mack *et al.* (2000), Mayr & Rand (1937), Pratt (1982), Rand & Gilliard (1967), Ripley (1964), Strange (2001).

45. Solomon Cuckoo-shrike

Coracina holopolia

French: Échenilleur des Salomon **Spanish**: Oruguero de las Salomón
German: Salomonenraupenfänger
Other common names: Solomon (Islands) Cicadabird, Black-bellied Cuckoo-shrike(!)/Cicadabird

Taxonomy. *Graucaulus holopolius* Sharpe, 1888, Guadalcanal, Solomon Islands.
Three subspecies recognized.
Subspecies and Distribution.
C. h. holopolia (Sharpe, 1888) – Solomon Is (Buka, Bougainville, Choiseul, Santa Isabel, Guadalcanal).
C. h. pygmaea (Mayr, 1931) – C Solomons (Kolombangara, New Georgia, Vangunu, Gatukai).
C. h. tricolor (Mayr, 1931) – Malaita I (S Solomons).



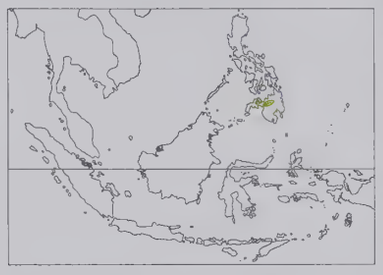
Descriptive notes. 20–23 cm; 41–47 g. Male nominate race has crown and upperparts, including upperwing-coverts and tertials, grey, variable black nuchal collar (sometimes more or less absent); alula, remiges and tail black, primary coverts, primaries and secondaries edged grey; base of forehead, head side, neck side, throat and entire underparts black; iris dark brown; bill and legs black. Distinguished from extremely similar *C. montana* by having broad pale grey edging on secondaries and tertials. Female is generally grey, including on head, with wings as male, tail darker grey, becoming black towards tip, outer feathers broadly tipped grey; eye mid-grey. Juvenile has body fawn-coloured with brown barring, underparts boldly barred, remiges fuscous, edged and tipped fawn, central two rectrices grey, others browner than adult's and tipped fawn; immature like adult, but throat, breast, undertail-coverts, underwing-coverts and axillaries boldly barred black and white, grading into grey with narrow white bars on flanks and belly, also with white flecks on auriculars. Race *tricolor* is smaller than nominate, male has broad black forehead, broad black nuchal collar, no grey on edges of primaries and primary coverts, and very pale grey upperwing-coverts and edges of secondaries; *pygmaea* is much smaller than nominate, darker grey on upperparts, and with restricted black on forehead and nuchal collar. Voice. Rasping or quavering upslurred "vrhee", "vvrreeeoo" or "toe-hee", often repeated up to ten times, in case of race *pygmaea* notes downslurred, decelerating and dropping in pitch; harsh chattering "chur-chur-ur-ur".
Habitat. Forest and forest edge, from sea-level to 950 m.
Food and Feeding. Apparently eats mainly insects, but also takes fruit. Occurs in canopy, in groups of up to eight individuals birds; commonly joins mixed-species foraging flocks. Much prey taken by sallying or hovering.
Breeding. Female in breeding condition in Aug on Bougainville. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in the Solomon Group EBA. Generally rather scarce, but regarded as fairly common on Bougainville and Buka I; most common in hills. Degree to which it is able to survive in logged and degraded forest is poorly known. Lowland forest throughout the region is threatened by widespread logging; as a large proportion of this species' population appears to inhabit forest unsuitable for logging, however, its numbers are probably declining only relatively slowly.
Bibliography. Buckingham *et al.* (1995), Cain & Galbraith (1956), Coates (1990), Doughty *et al.* (1999), Dutson (2005b), Galbraith & Galbraith (1962), Hadden (1981), Kaestner (1987), Mayr (1931, 1955), Schodde (1977), Stattersfield & Capper (2000), Webb (1992).

46. McGregor's Cuckoo-shrike

Coracina mcgregori

French: Échenilleur de McGregor **Spanish**: Oruguero de McGregor
German: Spitzschwanz-Raupenfänger
Other common names: Sharp-tailed Cuckoo-shrike

Taxonomy. *Malindangia mcgregori* Mearns, 1907, Mount Malindang, Mindanao, Philippines.
Birds from Bukidnon ranges described as race *peterseni* on basis of paler underparts, but considered indistinguishable from birds elsewhere in species' range. Monotypic.
Distribution. Mountains of WC Mindanao (Malindang and Bukidnon), in S Philippines.



Descriptive notes. 21 cm; 39–47·5 g. A relatively small cuckoo-shrike. Male has forehead, lores, face, chin, throat and upper breast bluish-black; crown to rump grey, becoming paler on rump and uppertail-coverts; upperwing-coverts grey, outer webs of median and greater coverts white (broad white wingbar); remiges black, primaries margined white; rectrices black, edged and tipped white on outers, central pair grey; lower breast grey, becoming white on belly and undertail-coverts; iris dark brown; bill black; legs blackish-grey. Distinguished from similar *C. ostenta* by paler overall coloration, pattern of white wingbar, and less extensive black on underparts. Female is like male, but black on head paler, almost dark grey. Juvenile has upperparts and breast grey, mottled black and with buff feather edges, belly feathers with dark shaft streaks; immature not fully described. Voice. Call of one or more notes, often continuing for several minutes, some notes raspy, "chu chu chu zwheeeeeeet zhuuuuuuuu", likened to sounds made when tuning a radio; also repeated "zwheeet".
Habitat. Montane mossy forest and forest edge, at 1000–1900 m.
Food and Feeding. Food undescribed; presumably insects. Forages in groups in canopy or understorey; also joins mixed-species flocks.
Breeding. Recently fledged young in Mar; birds with enlarged gonads in Apr–Jun. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Mindanao and the Eastern Visayas EBA. Known from at least eight general mountain-range localities; common within its small range. Much forest above 1300 m now seriously threatened by clearance at one locality (Mt Kitanglad); in general, however, forest at elevations occupied by this species is fairly secure.
Bibliography. Anon. (1997b), Collar & Andrew (1988), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Delacour & Mayr (1946), Dickinson *et al.* (1991), Gonzalez & Mallari (1993), Heaney *et al.* (1993), Inskipp *et al.* (1996), Kennedy *et al.* (2000), Lambert (1993), Mallari *et al.* (2001), McGregor (1921), Meyer de Schauensee & duPont (1962), Pardo & Gogorza y González (1997), Rabor (1977), Rand & Rabor (1960), Ripley & Rabor (1961), Salomonsen (1953), Stattersfield & Capper (2000).

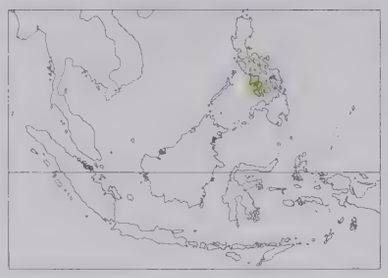
47. White-winged Cuckoo-shrike

Coracina ostenta

French: Échenilleur à ailes blanches **Spanish**: Oruguero Aliblanco
German: Spiegelraupenfänger
Other common names: Philippine Cuckoo-shrike

Taxonomy. *Coracina ostenta* Ripley, 1952, Panay and Guimaras, Philippines.
Species previously known as *C. panayensis*, but that name preoccupied by a race of *C. striata*. Monotypic.
Distribution. Panay, Guimaras (probably extinct) and Negros, in WC Philippines.
Descriptive notes. 25 cm. Distinctive. Male has forehead, lores, face, chin, throat and upper breast black; crown dark grey, upperparts dark grey, becoming light grey on rump and uppertail-coverts; wings black, broad white edges of greater upperwing-coverts and tertials (prominent white wingbar); rectrices black, tipped white, tips becoming broader on outer feathers, outermost wholly edged white; breast to belly dark grey, becoming lighter towards vent, white on undertail-coverts; underwing-coverts white; iris dark brown; bill and legs black. Female is similar to male, but has lores and forehead dark grey, upperparts dark bluish-grey, underparts light grey. Juvenile and immature undescribed. Voice. Has loud, sharp downward-inflected "schiirp" or "pi-ieu", often repeated 10–20 times; also a longer series of notes, rendered "chu chu chu chu pi-ieuu ki chu".
Habitat. Lowland and mid-montane forest, usually below 1100 m, rarely to 2150 m; also at forest edge and in secondary forest.

On following pages: 48. Indochinese Cuckoo-shrike (*Coracina polioptera*); 49. Black-winged Cuckoo-shrike (*Coracina melaschistos*); 50. Lesser Cuckoo-shrike (*Coracina fimbriata*); 51. Black-headed Cuckoo-shrike (*Coracina melanoptera*).



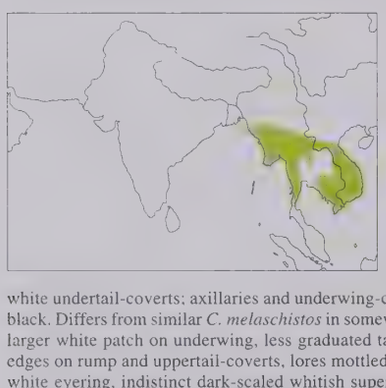
Food and Feeding. Eats adult and larval insects, including orthopterans. Found in upper storey of large trees, foraging mainly in canopy; also joins mixed-species foraging flocks.
Breeding. Recorded in Feb–Mar, Jul and Sept on Panay; juveniles being fed by adults in May on Negros. Nest undescribed, placed up to 20 m above ground on forked branch of tall tree. Eggs 2–3; chicks fed by both parents. No other information.
Movements. None recorded; some seasonal altitudinal migration may occur.
Status and Conservation. VULNERABLE. Restricted-range species: present in Negros and Panay EBA. Has small range (23,000 km²) which is fragmented, and throughout which habitat degradation, particularly the selective logging of large trees, poses serious threat to remaining forest fragments. Global population estimated at fewer than 10,000 individuals, and declining. Was formerly widespread on Negros; now restricted to seven known localities, where it is still locally common. Much scarcer on Panay, with recent records from only three localities in W of island. Presumed extinct on Guimaras as a result of chronic deforestation; has not been recorded there for over a century. This species is suffering a rapid population decline following extensive loss and degradation of forest habitat at low to middle altitudes; in 1988, estimated that only 4% of Negros and 8% of Panay remained forested. Much of the forest left on Panay and Negros lies above the species' altitudinal limit; significant populations unlikely to survive in montane forest, and it lives at relatively low densities in secondary forest. Occurs in Mount Canlaon Natural Park (Negros) and in the North Negros Forest Reserve; the latter is only nominally protected. Also found in the proposed Panay Mountains National Park, which apparently contains the largest block of forest remaining in the W Visayas, and at Mt Talinis–Twin Lakes (Negros), both of which receive conservation funding.
Bibliography. Anon. (1997b), Brooks *et al.* (1992), Collar & Andrew (1988), Collar, Andreev et al. (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Dickinson, Dekker et al. (2002a), Dickinson, Kennedy & Parkes (1991), Erickson & Heideman (1983), Evans, Dutson & Brooks (1993), Inskipp *et al.* (1996), Kennedy *et al.* (2000), Lambert (1993), Mallari *et al.* (2001), Pardo & Gogorza y González (1997), Parkes (1971), Rabor (1977), Stattersfield & Capper (2000).

48. Indochinese Cuckoo-shrike

Coracina polioptera

French: Échenilleur indochinois **German**: Gartenraupenfänger **Spanish**: Oruguero de Indochina

Taxonomy. *Campophaga polioptera* Sharpe, 1878, Cochinchina.
Formerly sometimes treated as conspecific with *C. fimbriata*. Three subspecies recognized.
Subspecies and Distribution.
C. p. indochinensis (Kloss, 1925) – W, C & E Myanmar, NW & E Thailand (S to Kamphaeng Phet), C & S Laos and SC Vietnam.
C. p. polioptera (Sharpe, 1878) – SE Myanmar, SW Thailand (from Kanchanaburi S to Isthmus of Kra), Cambodia and extreme S Vietnam (Cochinchina).
C. p. jabouillei Delacour, 1951 – C Vietnam (N & C Annam).



Descriptive notes. 21–23 cm; mean 35·8 g (Thailand). Male nominate race has crown and upperparts, including upperwing-coverts, ashy grey, darker on head, paler on median and greater wing-coverts, rump and uppertail-coverts; lores and ear-coverts slightly dusky; alula, primary coverts and primaries black, narrowly edged grey to white, primaries broadly white on inner webs (white patch on underwing visible in flight); secondaries and tertials black, with grey outer webs; rectrices black, broadly tipped white, central pair ashy grey, becoming black towards tip; light grey below, darker on throat and paling towards abdomen and vent, white undertail-coverts; axillaries and underwing-coverts light grey; iris red to brown; bill and legs black. Differs from similar *C. melaschistos* in somewhat paler general coloration, pale wing edgings, larger white patch on underwing, less graduated tail. Female is like male, but has whitish feather edges on rump and uppertail-coverts, lores mottled white, ear-coverts grey with white streaks, thin white eyering, indistinct dark-scaled whitish supercilium, entirely dull white and barred blackish below (barring sometimes reduced or absent); rectrix R2 black with ashy-grey outer web and white tip. Juvenile is irregularly barred black on face, ear-coverts, supercilium, lower back and rump, and below; immature like female, incompletely described but paler overall, with broader greyish-white margins of remiges, more strongly barred underparts. Race *indochinensis* is larger and darker than nominate; *jabouillei* is even darker, with grey of underparts deeper and more uniform, and central rectrices black. VOICE. Whistled song of 6–7 notes in descending sequence, also nasal chuntering "uh'uh'uh'uh-ik"; in Myanmar, a loud, metallic 3-note descending call.
Habitat. Open forest, secondary growth, deciduous woodland (Thailand), pine (*Pinus*) forest, locally peatswamp-forest; sometimes in town gardens. From 300 m to 1500 m.
Food and Feeding. Eats insects, including caterpillars (Lepidoptera). Forages in canopy and middle storey, moving with slow, deliberate actions; may join mixed-species flocks.
Breeding. Generally Apr–May; Apr–Jul in Myanmar. Nest a saucer of fine twigs and roots, bound with cobwebs; usually high in tree. Eggs 2–3. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Fairly common in all parts of its range.
Bibliography. Bangs & Van Tyne (1931), Buckton *et al.* (1999), Chazee (1994), Deignan (1945), Delacour (1951a, 1951b), Delacour & Jabouille (1940), Eames & Ericson (1996), Eames & Robson (1992), Inskipp *et al.* (1996), King *et al.* (1975), Lekagul & Round (1991), Mayr (1951), Robson (2000), Round (1988, 2000a), Smythies (1986), Stepanyan (1995), Tordoff *et al.* (2000).

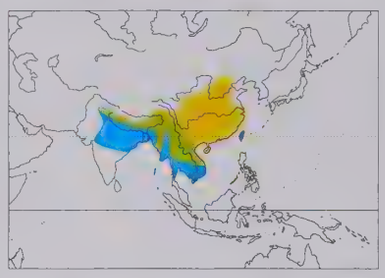
49. Black-winged Cuckoo-shrike

Coracina melaschistos

French: Échenilleur ardoisé **German**: Trauerraupenfänger **Spanish**: Oruguero Alinegro

Other common names: Dark-grey/Lesser Grey Cuckoo-shrike

Taxonomy. *Volvocivora melaschistos* Hodgson, 1836, Nepal.
Formerly sometimes considered conspecific with *C. fimbriata* or *C. melanoptera*. Relatively fine bill and colour of upperparts suggest that the three are possibly linked also with African *C. graueri* and Madagascan *C. cinerea*. Four subspecies recognized.
Subspecies and Distribution.
C. m. melaschistos (Hodgson, 1836) – N Pakistan (Murree Hills), and Himalayas E to NE India (upper Assam), S China (SE Xizang E to NW Yunnan) and W & N Myanmar; non-breeding S to N & NE India, SE Bangladesh (Chittagongs) and NW Thailand.
C. m. intermedia (Hume, 1877) – C, E & SE China (Gansu E to Hebei, S to Guangxi and Guangdong); non-breeding S Myanmar, S Thailand, S Vietnam, S China and Taiwan.
C. m. avensis (Blyth, 1852) – SW China (Sichuan, Yunnan, S Guizhou), S & E Myanmar, N Thailand, N Laos and N & C Vietnam; non-breeding also S to S Myanmar, S Thailand and S Indochina.
C. m. saturata (Swinhoe, 1870) – NE & C Vietnam (E Tonkin, N & C Annam) and Hainan I; non-breeding NW Thailand, S Laos, Cambodia and S Annam.



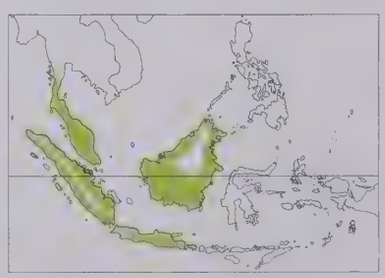
Descriptive notes. 19·5–24 cm; 35–42 g. A dark-looking cuckoo-shrike with relatively long, well-graduated tail. Male is overall dark iron-grey with slaty gloss, slightly paler slate on rump and uppertail-coverts, black around eye, on cheek and on ear-coverts; wings black, glossed green, lesser upperwing-coverts dark iron-grey; rectrices black, tipped white, central pair tipped grey; underparts paler towards abdomen and undertail-coverts; iris red-brown to dark brown; bill and legs black. Differs from *C. polioptera* in darker coloration, more graduated tail, no pale wing edgings, little or no white on primaries below. Female is sometimes very similar to male, but paler in general, often weakly barred dark and pale grey on underparts, including vent; often has broken white eyering and fine whitish streaks on cheeks. Juvenile is blackish-brown above and brownish-grey below, heavily scaled whitish all over, upperwing-coverts and tertials broadly tipped white; immature like female, but more strongly and extensively barred below, has pale tips of remiges and whitish tips of rectrices. Races differ in depth of coloration: *avensis* is paler than nominate; *intermedia* is even paler; *saturata* is darkest race, also small. VOICE. Song a series of 3 or more high-pitched, descending, downslurred whistles, preceded by few short, soft low notes; also raptor-like squealing; calls include a chatter like that of magpie (Corvidae).
Habitat. Deciduous forest, also broadleaf evergreen forest, open forest, edge, groves and bamboo jungle; in non-breeding season also in gardens, abandoned cultivation, open areas and woodland. Breeds at 300–2450 m; at lower elevations and in plains and valleys in non-breeding season.
Food and Feeding. Eats insects, mainly caterpillars (Lepidoptera) but also beetles (Coleoptera) and bugs (Hemiptera); also takes some fruit. Fairly active and conspicuous; normally forages singly or in pairs; often joins mixed-species parties. Gleans insects from leaves, usually in canopy but sometimes in undergrowth.
Breeding. Nests Apr–Jul. Nest a very small cup of twigs, rootlets, fibres, bark and lichens, bound with cobwebs, placed 3–8 m above ground on fork of tree branch. Eggs 2–4. No other information.
Movements. Marked seasonal movements, both altitudinal and latitudinal. Post-breeding descent from mountains to plains and valleys within breeding range, also migration to S. Migrants occur in breeding areas from late Mar to Oct. Nominate race associates with *intermedia* and *avensis* in non-breeding season; *intermedia* known to migrate through Yunnan (S China), and spends winter months alongside *avensis*, sometimes also with *saturata*, in SE Asia.
Status and Conservation. Not globally threatened. Very rare and local in Pakistan, frequent in Nepal, locally fairly common in India, and common in Bhutan; local in Bangladesh. Fairly common resident in SE Asia, where also locally common non-breeding visitor. Uncommon to locally common in China. Occurs in several protected area, including e.g. Royal Chitwan National Park, in Nepal, and Kaeng Krachan National Park, in Thailand.
Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Carey *et al.* (2001), Cheng Tsohsin (1987), Deignan (1945), Delacour (1951b), Dickinson & Dekker (2002a), Eames & Ericson (1996), Eames & Robson (1992), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Jerdon (1862), Khan (1988), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Mayr (1951), Rasmussen & Anderton (2005), Ripley (1982), Roberts (1992), Robson (2000), Round (1988), Smythies (1986), Stepanyan (1995), Wells (2005), Yoganand (1997).

50. Lesser Cuckoo-shrike

Coracina fimbriata

French: Échenilleur frangé **German**: Zwergraupenfänger **Spanish**: Oruguero Menor

Taxonomy. *Ceblepyris fimbriatus* Temminck, 1824, Java.
Was in the past sometimes considered conspecific variously with *C. polioptera*, *C. melaschistos* and *C. melanoptera*. Relatively fine bill and colour of upperparts suggest possible link also with African *C. graueri* and Madagascan *C. cinerea*. Five subspecies recognized.
Subspecies and Distribution.
C. f. neglecta (Hume, 1877) – S Myanmar and S Thailand.
C. f. culminata (Hay, 1845) – Peninsular Malaysia.
C. f. schierbrandi (Pelzeln, 1865) – Sumatra and Borneo.
C. f. compta (Richmond, 1903) – Simeulue and Siberut (off W Sumatra).
C. f. fimbriata (Temminck, 1824) – Java and Bali.



Descriptive notes. 19–20·5 cm; 28–30 g. A small, short-tailed cuckoo-shrike with a rather fine bill. Male of nominate race has crown and upperparts dark slaty grey, being paler on rump and uppertail-coverts; lores and ear-coverts darker; wings black with glossy feather margins, lesser upperwing-coverts edged slaty grey; rectrices black, tipped greyish or white; throat and underparts, including underwing-coverts, dark slaty grey, becoming progressively paler towards abdomen and undertail-coverts; iris brown to red-brown; bill and legs are black. Differs from *C. melaschistos* in smaller size, less graduated

tail with less white at tips; from *C. polioptera* in lack of pale wing edgings. Female is paler grey above, ear-coverts and supercilium scaled dusky and whitish, white broken eyering, wings dark grey, wing-coverts edged pale greyish, remiges edged and tipped white, whitish patch on inner webs of some primaries and secondaries, greyish-white underparts barred dusky black. Juvenile not fully described; immature like female but paler, with variable barring on rump and uppertail-coverts, young female with reduced white on inner webs of primaries and secondaries. Races differ in size and in depth of coloration: *compta* is smaller than nominate, head less black; *culminata* is smaller and slightly less dark than previous; *schierbrandi* is same size as last, but darker; *neglecta* is largest and palest race. VOICE. Song a repeated, loud "whit-it-it-chui-choi" and so on; also has rapid series of "whit" notes and, when alarmed, a squeaky, nasal, repeated "wherrrh" and high "whit-weei".

Habitat. Forest, secondary growth, peatswamp-forest, farmland; lowlands to 1000 m, occasionally to 1500 m.

Food and Feeding. Food mainly insects, including caterpillars (Lepidoptera), flies (Diptera), beetles (Coleoptera), grasshoppers (Orthoptera); also flower spiders (Araneae), and some fruit and seeds taken. Forages in canopy; joins mixed-species flocks.

Breeding. Dependent juveniles in May and Jul in Peninsular Malaysia. Nest a small, neat cup placed on horizontal tree branch. Eggs 2. No other information.

Movements. None recorded.

Status and Conservation. Not globally threatened. Generally uncommon. Reasonably common in S Thailand and Peninsular Malaysia, but rare in Singapore; rather scarce and local in Greater Sundas. Regarded as "Near-threatened" in Malay Peninsula as a result of destruction of forest habitat. Occurs in a few protected areas, including Taman Negara National Park, in Peninsular Malaysia, Danum Valley Conservation Area, in Borneo, and Gunung Gede-Pangrango National Park, in Java and Bali.

Bibliography. Andrew (1985), van Balen (1999), Davison (1995), Delacour (1951b), Hawa (1985), Hellebrekers & Hoogerwerf (1967), Inskipp *et al.* (1996), Jeyarajasingam & Pearson (1999), King *et al.* (1975), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Medway & Wells (1976), Robson (2000), Round (1988), Smythies (1986, 1999), Vowles & Vowles (1997), Wells (1990a, 2005).

51. Black-headed Cuckoo-shrike

Coracina melanoptera

French: Échenilleur à tête noire **Spanish**: Oruguero Cabecinegro
German: Schwarzkopf-Raupenfänger
Other common names: Large Grey Cuckoo-shrike

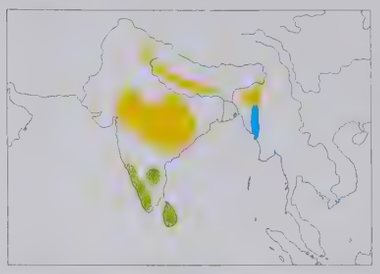
Taxonomy. *Ceblepyris melanoptera* Rüppell, 1839, New Holland?; error = Bhadwar, Kangra District, Punjab, India.

Type specimen not correctly described until 1951; species was formerly referred to as *C. sykesi*. Was in the past sometimes considered conspecific with *C. melaschistos* or *C. fimbriata*. Relatively fine bill and colour of upperparts suggest that the three are possibly linked also with African *C. graueri* and Madagascan *C. cinerea*. Two subspecies recognized.

Subspecies and Distribution.

C. m. melanoptera (Rüppell, 1839) – NW India (Himachal Pradesh, N Uttar Pradesh).

C. m. sykesi (Strickland, 1844) – S Nepal, India (E Rajasthan, Gujarat and NC Uttar Pradesh E to Assam, Nagaland and Manipur, S to Kerala and Tamil Nadu), Bangladesh and Sri Lanka; non-breeding E to W & SW Myanmar.



Descriptive notes. 19–20 cm; 24–36 g. Male nominate race has dark slate-grey head, neck and upper breast; mantle and rest of upperparts and underparts pale grey, becoming white on belly, vent and undertail-coverts; wings darker grey than mantle, broad pale fringes of upperwing-coverts and tertials; remiges black, edged whitish-grey, with white patch on inner webs of primaries; rectrices black, broadly tipped white, central pair grey; iris dark red-brown; bill and legs black. Female has whitish supercilium, upperparts slightly brownish-grey, back and rump lightly barred dark grey, wings and tail as male but duller, underparts buffy white, widely barred dark brown. Juvenile is similar to female, but upperparts barred white, and tertials and upperwing-coverts have dark subterminal marks; immature like female. Race *sykesi* is smaller and paler than nominate, with shorter tail, abdomen mostly white. VOICE. Often silent. Song a series of clear, mellow, whistled notes, "twit-wit-wit-wee-twéé-twéé-twy-twy-twy", often followed by quick, repeated "pit-pit-pit"; also a series of loud, upslurred whistles, "kwée"; female emits chirp.

Habitat. Open forest, secondary growth, scrub-jungle and bamboo; also in gardens, orchards, hedgerows, and trees in towns and cities. Lowlands to 1650 m; sometimes to 2100 m (Himalayas).

Food and Feeding. Food mostly insects, especially caterpillars (Lepidoptera); also takes fruit such as *Lantana* berries and figs (*Ficus*). Forages singly, in pairs or in small parties; often joins mixed-species foraging flocks. Flies from tree to tree, examining foliage slowly and carefully, gleaning from leaves, twigs and branches. Prefers to forage in tall trees; rarely, descends to the ground, where it progresses with long hops, like a thrush (Turdidae).

Breeding. Jun–Sept in N India and Nepal, Jun–Aug in C India and Apr–May in S; Mar–May in Sri Lanka. Nest a saucer of dry grasses, lightly bound with cobwebs, placed 2–8 m above ground in fork of bare branch of large tree. Eggs 2–3; incubation by both sexes. No other information.

Movements. Resident and partial migrant. Seasonal movements in Nepal, where seen mainly in spring and summer. In N & C India, mainly a breeding visitor; occurs throughout year in SW & SE, but population augmented by migrants in winter. Apparently transient throughout N plains and peninsula; mainly non-breeding visitor to S India and S Bangladesh, and scarce winter visitor to W & SW Myanmar. Occurs in Nilgiri Hills mostly in winter months (Oct–Apr); marked passage recorded in Jun and Sept–Oct in Maharashtra and Karnataka. Resident in Sri Lanka.

Status and Conservation. Not globally threatened. Scarce in Nepal; locally fairly common in India; local in Bangladesh; uncommon and local in Sri Lanka. Occurs in several protected areas, e.g. Nagarhole National Park, in India.

Bibliography. Ali (1969), Ali & Ripley (1996), Anon. (1998c), Chakravarthy & Purna Chandra Tejasvi (1992), Daniels (1997), Delacour (1951b), Dickinson & Dekker (2002a), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Himmatsinhji (1963), Inskipp & Inskipp (1991), Jerdon (1862), Kazmierczak (2000), Kotagama (1985a, 1985b), Rasmussen & Anderton (2005), Ripley (1982), Saha & Dasgupta (1992), Simmons (1948), Smythies (1986), Sugathan & Varghese (1996).


ssp sloetii
52
ssp flaviceps
ssp minor
53
ssp melanoleuca
ssp davisoni
PLATE 8
inches 3
cm 8
54
ssp nigra
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56
57

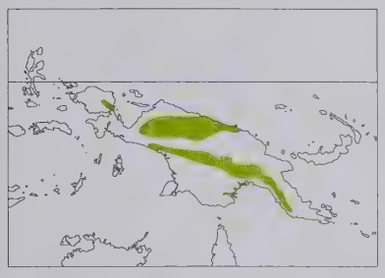
Genus *CAMPOCHAERA* Sharpe, 1878

52. Golden Cuckoo-shrike

Campochaera sloetii

French: Échenilleur doré **German**: Goldraupenfänger **Spanish**: Oruguero Dorado
Other common names: Orange Cuckoo-shrike

Taxonomy. *Campephaga sloetii* Schlegel, 1866, Seleh, south-west cape of the Vogelkop, New Guinea.
Two subspecies recognized.
Subspecies and Distribution.
C. s. sloetii (Schlegel, 1866) – Arfak Mts (foothills) and N New Guinea lowlands (E to Wewak area).
C. s. flaviceps Salvadori, 1880 – S New Guinea lowlands from R Mimika E to Moroka, and foothills of Owen Stanley Range.



Descriptive notes. 20 cm; 36–46 g. A small cuckoo-shrike with small bill; striking plumage, dominated by golden-yellow, unique in family. Male nominate race has crown grey; base of forehead, lores and ear-coverts to throat and upper breast black, glossed greenish, black area separated from crown and hindneck by white band; upperparts predominantly golden-yellow, slightly more olive on scapulars, brighter from lower back to uppertail-coverts; upperwing-coverts black, glossed greenish, medians narrowly tipped white, greaters broadly edged white; primary coverts and remiges black, tertials edged white; rectrices black, tipped white, white broadest on outermost; underparts bright golden-yellow, axillaries and underwing-coverts white; iris dark brown; bill and legs black. Female is less brilliant yellow than male, has mantle olive-tinged, black on head and breast replaced by grey, but feathers around eye black, grey of crown washed yellow. Juvenile undescribed; immature like female, but grey of head replaced by yellow, with grey patch only on upper breast. Race *flaviceps* differs from nominate in having crown more greenish, and overall coloration slightly more olive-yellow. Voice. Noisy. Male has rapid, bubbling, repeated "chirrapa", often with upslurred note added, as "chrripaéé" or "wírrápáhee"; often 1–2 pairs of downslurred and upslurred notes added, and female may make chipping or chuckling notes before male's call. Duetting displays frequent, female giving upslurred or downslurred notes during last 2–3 notes of male's call. Birds from NW of range lack the musical slurs, start the call with explosive clicking.
Habitat. Primary forest and forest edge; mainly in hill forest, locally also in lowlands near hills. Occurs locally up to 1100 m.
Food and Feeding. Eats mostly fruit; insects also recorded. Occurs in pairs or small parties in upper canopy and outer foliage. Forages actively and noisily; obtains food by gleaning and by "flycatcher-gleaning".
Breeding. No information. Thought to breed during rainy season, Nov–Mar.
Movements. None recorded.
Status and Conservation. Not globally threatened. Known distribution rather patchy; locally common. Not well known.
Bibliography. Andrew (1992), Beehler *et al.* (1986), Bell (1982b), Coates (1990, 2001), Diamond (1972), Diamond & Terborgh (1968), Gregory (1995), Mack *et al.* (2000), Rand (1942), Rand & Gilliard (1967), Ripley (1964).

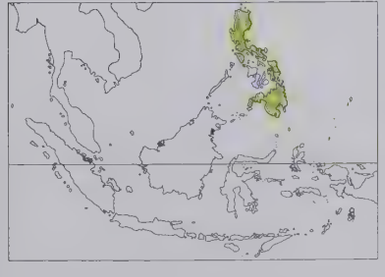
Genus *LALAGE* Boie, 1826

53. Black-and-white Triller

Lalage melanoleuca

French: Échenilleur noir et blanc **German**: Philippinenlalage **Spanish**: Oruguero Blanquinegro

Taxonomy. *Pseudolalage melanoleuca* Blyth, 1861, Luzon, Philippines.
Two subspecies recognized.
Subspecies and Distribution.
L. m. melanoleuca (Blyth, 1861) – N Philippines (Luzon, Mindoro, Semirara).
L. m. minor (Steere, 1890) – EC & S Philippines (Samar, Leyte, Mindanao).



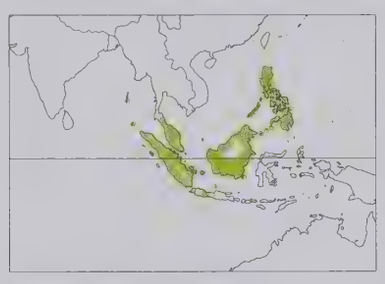
Descriptive notes. 21–22 cm; 42–48·5 g. Male nominate race is glossy greenish-black above, centre of back grey, rump and uppertail-coverts white; scapulars and most upperwing-coverts as mantle, innermost median coverts pure white, innermost greaters have white outer webs; remiges greenish-black, secondaries edged white (white edges, together with white on coverts, form white line along closed wing); rectrices greenish-black, narrowly tipped white, white broadest on outermost pair; entirely white below, including underwing-coverts; iris dark brown; bill and legs black to grey-black. Distinguished from *L. nigra* and *Pericrocotus divaricatus* by relatively large size, white lower back and rump, lack of white supercilium. Female is like male but grey replaces black on upperparts, and has grey-barred underparts. Juvenile and immature undescribed. Race *minor* is smaller than nominate, underparts of female darker grey. Voice. A loud series of repeated "cha-chi" notes or longer "ka-choo" notes, each series lasting for 3–12 seconds or longer; also staccato "chi chi chi chi".
Habitat. Canopy of forest and forest edge, below 1000 m.
Food and Feeding. No information on diet; presumably insectivorous. Occurs singly, in groups or with mixed-species foraging flocks.
Breeding. Juveniles in May on Luzon and Mindoro. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Not well known; currently regarded as uncommon to fairly common. Occurs in Quezon National Park, on Luzon.
Bibliography. Danielsen *et al.* (1994), Delacour & Mayr (1946), Dickinson *et al.* (1991), duPont (1971), Gilliard (1950), Goodman & Gonzales (1990), Inskipp *et al.* (1996), Kennedy *et al.* (2000), McGregor (1905), Pardo & Gogorza y González (1997), Rabor (1977), Rand & Rabor (1960).

54. Pied Triller

Lalage nigra

French: Échenilleur térat **German**: Weißstirnlalage **Spanish**: Oruguero Pío

Taxonomy. *Turdus niger* J. R. Forster, 1781, East Indies = Manila, Philippines.
May form a superspecies with *L. leucopygialis*, and the two are often considered conspecific; nevertheless, on basis of plumage characters, present species appears to be closer to *L. sueurii* than to *L. leucopygialis*. It has been suggested that present species may form a superspecies with *L. sueurii*, or that the two might even be conspecific; in such scenarios, merging of *L. leucopygialis* into present species would be inappropiate, due to resultant sympatry with *L. sueurii* in Sulawesi; indeed, present species and *L. sueurii* may be sympatric in C Java. In past, type specimen of present species was reckoned to have come from Singapore; under that arrangement, the populations of mainland SE Asia, Sumatra and Java now labelled as race *striga* constituted the nominate race, while the populations of Borneo and Philippines now considered to form the nominate were allotted race *chilensis*. Three subspecies currently recognized.
Subspecies and Distribution.
L. n. davisoni Kloss, 1926 – S Andaman Is, and C Nicobar Is (Camorta, Katchall, Trinkat).
L. n. striga (Horsfield, 1821) – S Thailand, Peninsular Malaysia, Singapore, Sumatra (including Nias I), Bangka, Belitung and W Java (including Karimunjawa Is).
L. n. nigra (J. R. Forster, 1781) – Borneo and adjacent islands, and Philippines.



Descriptive notes. 16·5–18 cm (*striga*, *nigra*), 13·5–14 cm (*davisoni*); 20–31 g. Male nominate race has forehead, crown, nape, mantle and scapulars glossy black; broad white supercilium, black lores and streak through eye to nape; rest of head side white; back to uppertail-coverts dove-grey, uppertail-coverts slightly darker and tipped white; alula, lesser upperwing-coverts and primary coverts black, median and greater coverts white; remiges black, secondaries broadly fringed white, inner primaries tipped white; rectrices black, tipped white, outermost white except for black basal half of inner web; throat and underparts, including axillaries and underwing-coverts, white, breast washed pale grey; iris dark brown; bill and legs black. Differs from *L. leucopygialis* in having grey, not white, rump and uppertail-coverts. Female has black of plumage replaced by greyish-brown, grey of back to uppertail-coverts tinged ashy, white edges and tips of upperwing-coverts and remiges narrower than on male, innermost rectrix mostly greyish-brown, underparts washed buffish with narrow dark scales. Juvenile is like female, but upperparts browner, with fine buff-white feather fringes, primaries more broadly tipped white, innermost rectrix entirely greyish-brown, side of throat, breast and undertail-coverts have blackish shaft streaks; immature resembles adult female. Races differ mainly in plumage of female: *striga* female has browner cap and mantle than nominate; *davisoni* is smaller, female greyer on upperparts. Voice. Has rather nasal chuckles, e.g. "chaka-chevu", "whéék-chuk" and similar; rattling "wheek chechechecheche-chuk", also "kew kew" followed by 2–8 "kyhek" or "chack" notes on descending scale; whining "whier" contact call.
Habitat. Open woodland, forest edge, farmland, roadsides and gardens in villages and towns, cultivation, plantations, coastal scrub, mangroves and casuarina (*Casuarina*) groves. Favours large trees, especially those with divided leaves, where these present. Lowlands to 1000 m; once to 1550 m in Peninsular Malaysia.
Food and Feeding. Food arthropods, mainly caterpillars (Lepidoptera) and "hard insects"; some fruit, mostly small berries (e.g. of euphorbs such as *Breynia*), also taken. Solitary, in pairs or in small flocks. Forages at all levels in trees, less often in bushes and hedgerows; takes prey mostly from outer foliage, but also from dead or leafless branches. Items usually captured in an upward hop from a perch to a surface; snatches flushed insects, and sometimes makes sallies of several metres. Occasionally hunts on ground, taking prey from short-grass areas.
Breeding. Breeds May in Nicobars, Feb–Aug in Malay Peninsula, Feb–Apr and Jun–Aug in Sumatra, Jun in Borneo and May–Jun in Philippines; two broods recorded in Singapore. Nest an open cup of grass, fibre, casuarina needles and the like, bound externally with cobwebs, placed on exposed but inaccessible, lichen-covered, horizontal branch 3–9 m above ground. Eggs 2–3; no information on incubation and fledging periods; young fed by both parents.
Movements. Primarily resident. Recorded seasonal changes in abundance in Singapore are suggestive of migration; local dispersal possible elsewhere in Malay Peninsula, but more observations needed.
Status and Conservation. Not globally threatened. In Peninsular Malaysia, regular and common in S and on W coastal plain, but local and uncommon to rare elsewhere; locally common to uncommon in S Thailand. Fairly common in Greater Sundas, but absent from Bali. Uncommon to rare on Nicobar Is.
Bibliography. Ali & Ripley (1996), Das (1971), Deignan (1963), Dickinson & Dekker (2002a), Dickinson *et al.* (1991), duPont & Rabor (1973a), Escott & Holmes (1980), Grimmett *et al.* (1998), Hawa (1985), Hellebrekers & Hoogerwerf (1967), Inskipp *et al.* (1996), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lekagul &

On following page: 55. White-rumped Triller (*Lalage leucopygialis*); 56. White-shouldered Triller (*Lalage sueurii*); 57. White-winged Triller (*Lalage tricolor*).

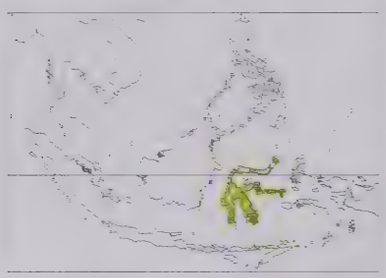
Round (1991), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), Mayr & Ripley (1941), McClure (1998), Medway & Wells (1976), Mees (1986, 1996), Rabor (1977), Rasmussen & Anderton (2005), Ripley (1982), Robson (2000), Round (1988), Sibley & Monroe (1990), Smythies (1999), Stresemann (1952), Wardill (1995), Wells (2005), White & Bruce (1986).

55. White-rumped Triller

Lalage leucopygialis

French: Échenilleur de Walden **German**: Sulawesilalage **Spanish**: Oruguero de Walden
Other common names: Sulawesi Triller

Taxonomy. *Lalage leucopygialis* Walden, 1872, Menado, Sulawesi.
May form a superspecies with *L. nigra*, and the two are often considered conspecific; nevertheless, on basis of plumage characters, *L. nigra* appears to be closer to *L. sueurii* than to present species. Sympatry of present species with *L. sueurii* in Sulawesi means that these two can not satisfactorily belong to the same superspecies. Monotypic.
Distribution. Sulawesi (including islands of Manadotua, Bangka, Muna and Buton), Banggai Is and Sula Is (Taliabu, Sanana).



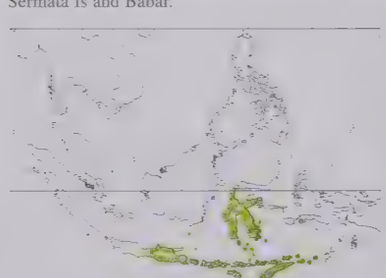
Descriptive notes. 19 cm. Male has forehead and crown to mantle and scapulars very dark grey to blackish, glossed greenish; broad white supercilium, blackish lores and streak through eye; eyelids and rest of head side white; lower back to uppertail-coverts pale grey, becoming white on rump; alula and lesser upperwing-coverts glossy blue-black, greater and median coverts blackish, broadly margined white; primary coverts black; remiges black, primaries narrowly tipped white, secondaries and tertials margined white; rectrices blackish, outermost two tipped white; throat and underparts pure white, tiny dusky bars on foreneck and throat, grey thighs; iris dark brown; bill and legs black. Differs from *L. nigra* in having white, not pale grey, rump. Female has black crown, paler and much greyer upperparts (where male dark grey to black), white edges and tips of upperwing-coverts and remiges less prominent than on male, underparts washed buffish with narrow dark scales. Juvenile is like female, but with rusty feather tips on upperparts, supercilium tinged rusty, all rectrices brown with white tips, underparts buffy white, dusky bars on flanks; immature undescribed. Voice. A loud, swelling series of rapid, hard, clear, chattering notes, duration 1·5 seconds, repeated at c. 3-second intervals.
Habitat. Forest edge, heavily disturbed forest, secondary forest, open woodland, farmland, gardens, lightly wooded cultivation and mangroves. Sea-level to 1000 m.
Food and Feeding. Diet not recorded; presumably similar to that of *L. nigra*. Occurs singly, in pairs or in small groups; forages in crowns of large and small trees, also in middle storey; also forages near ground in mangroves.
Breeding. Breeds in May. Nest a compact open cup, not properly described but probably similar to that of *L. nigra*; one was placed on horizontal branch 18 m above ground. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Widely distributed and locally common on Sulawesi; common on Taliabu. Not well known.
Bibliography. Andrew (1992), Catterall (1997), Coates & Bishop (1997), Dickinson & Dekker (2002a), Escott & Holmes (1980), Holmes & Phillipps (1996), Inskipp *et al.* (1996), Mayr & Ripley (1941), Stresemann (1939, 1952), Watling (1983a), Wells (2005), White & Bruce (1986).

56. White-shouldered Triller

Lalage sueurii

French: Échenilleur de Lesueur **German**: Weißschulterlalage **Spanish**: Oruguero de Lesueur
Other common names: Sueur's Triller

Taxonomy. *Turdus Suerii* [sic] Vieillot, 1818, New Holland; error = Timor.
May form a superspecies with *L. tricolor*, and the two are sometimes considered conspecific. It has been suggested that present species may form a superspecies with *L. nigra*, or that the two might even be conspecific, although they may be sympatric in C Java. Sympatry with *L. leucopygialis* in Sulawesi means that these two taxa can not satisfactorily belong to the same superspecies. Monotypic.
Distribution. C & E Java, Bali, Salembu Besar, NC & S Sulawesi (including Salayar, Buton and Tukangbesi), islands in Flores Sea (Tanahjampea, Kalao, Bonerate, Kalaotoa, Madu), and Lesser Sundas (Lombok E to Alor, S to Sumba, Savu, Roti and Timor) E to Wetar, Romang, Kisar, Moa, Sermata Is and Babar.



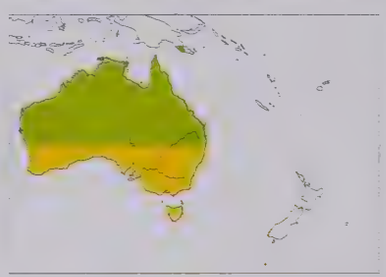
Descriptive notes. 17–18 cm. Male has top of head and upperparts glossy greenish-black; narrow white supercilium (sometimes poorly marked) bordered below by black line from base of bill to nape; lower back, rump and uppertail-coverts light grey, uppertail-coverts tipped whitish; lesser and median upperwing-coverts white with black shaft streaks (large "shoulder patch"), greater coverts black, edged white; remiges black, secondaries and tertials edged white; rectrices black, narrowly tipped white, central pair narrowly edged white; cheeks, ear-coverts, neck side, throat and entire underparts, including underwing-coverts and axillaries, pure white; iris dark brown; bill grey to black; legs black. Differs from *L. leucopygialis* in having greener dorsal gloss and white lesser upperwing-coverts; from *L. tricolor* in having white supercilium; from *L. nigra* in larger size, narrower supercilium, more white in wing, grey on lower back. Female has black of upperparts, wings and tail replaced by rufous-brown, supercilium washed rufous, pale buffish edges of upperwing-coverts and remiges, buffy white below, breast and flanks narrowly and indistinctly barred dusky, thighs greyish. Juvenile is like female, but lower back light brown, underparts with brownish shaft streaks; immature also like female, but not fully described. Voice. Harsh, rattling series of rapid, staccato notes that almost run together; song a series of c. 12 clear, rapidly repeated, musical notes.
Habitat. Woodland, savanna, open forest, scrub, overgrown or lightly wooded cultivation (including rice fields), also gardens and areas near human habitations; occasionally in swamps. Also mangroves in Lesser Sundas (Sumba). Lowlands to 1630 m. Generally prefers drier habitats than those favoured by *L. nigra*.
Food and Feeding. Diet not recorded; presumably insects. Perches in isolated trees and on stumps and fence posts; forages on the ground in short grass and on bare areas.
Breeding. Breeds in Apr–May in Lesser Sundas. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Current status not well known. Regarded as common in C Sulawesi, and expanding N, in 1980s; fairly common in E Java and Bali in 1990s; common on Tanahjampea. Widespread and locally common in Lesser Sundas, including on some of the small islands. Occurs in several protected areas in Java and Bali, e.g. Bali Barat National Park.
Bibliography. Andrew & Holmes (1990), van Balen (1999), Baltzer (1990), Bruce (1987), Coates & Bishop (1997), Escott & Holmes (1980), Fraser & Henson (1996), Immelmann (1962), Johnstone & Jepson (1996), Johnstone *et al.* (1996), Jones *et al.* (1994), Mackay (1976), MacKinnon & Phillipps (1993), Mayr & Ripley (1941), Mees (1986, 1996), Schodde & Mason (1999), Trainor (2002a), Wardill (1995), Watling (1983a), White & Bruce (1986).

57. White-winged Triller

Lalage tricolor

French: Échenilleur tricolore **German**: Weißflügellalage **Spanish**: Oruguero Tricolor
Other common names: Australian/Jardine Triller, White-shouldered Caterpillar-eater

Taxonomy. *Ceblepyris tricolor* Swainson, 1825, Sydney, New South Wales, Australia.
May form a superspecies with *L. sueurii*, and the two are sometimes considered conspecific. Monotypic.
Distribution. Australia, including Melville I and Tasmania; also SE New Guinea (Port Moresby area).



Descriptive notes. 15·5–18·5 cm; 26–31·5 g. Male breeding has top of head down to level of eye, and upperparts, upperwings and tail glossy greenish-black; lower back, rump and uppertail-coverts light grey; upperwing-coverts pure white, greater coverts with black inner webs; secondaries edged white, outer pair of rectrices broadly tipped white; throat and underparts, including underwing-coverts and axillaries, pure white; iris dark brown; bill and legs black. Differs from *L. sueurii* in lacking white supercilium; from *L. leucomela* also in prominent white "shoulder patch", entirely white underparts. Male "eclipse" plumage assumed after breeding, when head and mantle become brown (as on female), underparts whitish, and rectrices edged white. Female has black areas of breeding male replaced by brown, feathers of rump and uppertail-coverts edged pale buffy, narrow buff-white supercilium, ear-coverts indistinctly patterned brown and white, upperwing-coverts and secondaries brown with broad sandy-buff edges, brown tail feathers tipped whitish; underparts pale buff, obscure dusky barring on side of breast. Juvenile has head and nape freckled brown and white, buff edges of wing feathers, brown streaks on white underparts; immature like female, young male with more buff on head, mantle, upperwing-coverts and breast than eclipse male. Voice. Territorial song a clear, sustained, variable sequence of notes, "chiff-chiff-chiff-joey-joey-joey", ending in canary-like trill.
Habitat. Wide range of lightly timbered habitats with sparse open shrub layer and grassy ground cover, particularly dry, open eucalypt (*Eucalyptus*) woodland and forest, mallee, native pine and acacia (*Acacia*) scrub, spinifex and sparsely wooded farmland; sometimes in suburban areas. Rarely in heavily forested areas, except where clearing has taken place, at forest edges and in riverine forest. On migration, occurs in open country with trees, and sometimes coastal casuarina (*Casuarina*) groves. Requires bare ground or short grass for foraging; attracted to burnt ground, mown grass, and ground where crops have been harvested.
Food and Feeding. Eats insects, including caterpillars (Lepidoptera), grasshoppers and crickets (Acrididae, Tettigoniidae, Gryllidae), cockroaches (Blattodea), mantids (Mantodea), winged termites (Isoptera), ants (Formicidae), phasmids (Phasmatodea), bugs (Hemiptera, including Cicadidae and Cicadellidae), beetles (including families Scarabaeidae, Chrysomelidae, Apionidae, Circulidae), horseflies (Tabanidae), ichneumons (Ichneumonidae) and bees (Apidae); also takes spiders (Arachnida). Fruit and seeds also recorded; sometimes feeds on nectar of *Callistemon* (Myrtaceae). Forages singly or in pairs, sometimes (especially during non-breeding season) in flocks; occasionally joins mixed-species flocks. Often forages on the ground; sometimes feeds by gleaning among foliage and on trunks and branches of trees and bushes, and by sallying and sally-striking; sometimes hovers close to ground to sally-pounce on insects.
Breeding. Season Jun–Mar in Australia and Sept–Dec in New Guinea; also nests after rains in arid regions of Australia, where may nest twice during extended seasons of abundance. Usually monogamous, but there is one record of polygyny. Often nests in loose colonies. Nest built by both sexes, a small, frail, neat saucer of dry grass, bark, rootlets, stems, tendrils, plant down, moss, wool and horsehair, lined with fine grass and rootlets and bound with cobwebs, placed 1–12 m or more above ground on horizontal or slightly sloping fork of thin branch of tree or shrub, with preference for rough-barked trees; often builds within mistletoe (Loranthaceae) clump or below clump of leaves. Eggs 1–3, usually 2; incubation by both sexes, period c. 14 days; chicks fed and brooded by both parents for 8 days, thereafter by female only, nestling period 12 days; fledglings fed by female alone.
Movements. Partial migrant, largely vacating mainland Australia S of 29ºS in autumn (Feb–Apr) and moving to N Australia, returning S (mainly in Aug–Sept) to breed; a few individuals occasionally reach SE New Guinea (only one record from Torres Strait); return movements S in Australia recorded Aug–Oct. Also appears irregularly in many of the more arid districts of Australia, depending on rains; can be common in desert areas in good seasons. Migrates in flocks of 20–60 birds, but arrivals noted singly or in small parties. Sea crossings sometimes ship-assisted. Vagrants recorded on Lord Howe I and in New Zealand.
Status and Conservation. Not globally threatened. Widespread and sometimes locally common. Estimated densities 0·01–1 birds/ha. Sometimes locally common in New Guinea.
Bibliography. Beehler *et al.* (1986), Bell (1965, 1969), Beruldsen (1980), Blakers *et al.* (1984), Brooker & Brooker (1987), Brooker *et al.* (1979), Christidis & Boles (1994), Coates (1990), Hall (1974), Higgins *et al.* (2005), Hobbs (1986), Immelmann (1966), Keast (1958), Larkins (1983), MacDonald (1988), Mayr & Rand (1937), Morcombe (2000), Pizzey (1980), Rand & Gilliard (1967), Schodde & Mason (1999), Serventy & Whittell (1976), Simpson & Day (1994), Trounson & Trounson (1987), White & Bruce (1986).

PLATE 9 ➤



PLATE 9

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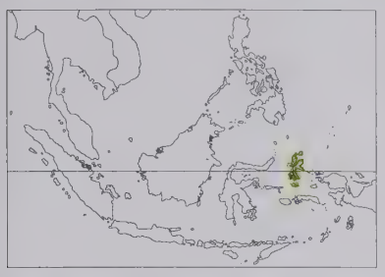
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58. **Rufous-bellied Triller**

Lalage aurea

French: Échenilleur orangé **German**: Rotbauchlalage **Spanish**: Oruguero Ventrirrufo
Other common names: Red-bellied/Moluccan/Black-backed Triller

Taxonomy. *Ceblepyris aureus* Temminck, 1825, Timor; error = Ternate, off west Halmahera.
Forms a superspecies with *L. atrovirens*, *L. leucomela* and *L. conjuncta*. Monotypic.
Distribution. N Moluccas: Morotai, Halmahera, Ternate, Kayoa, Kasiruta, Bacan and Obi.



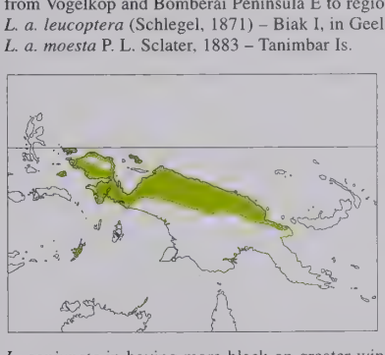
Descriptive notes. 20 cm. Male has upperparts glossy blue-black; narrow white supercilium and broken eyering, black line from base of bill through eye, white ear-coverts (white extending a little way down side of neck), white cheeks and chin; median upperwing-coverts white (forming bar across closed wing), greater coverts black at base and white towards tip (forming second wingbar); primary coverts and remiges black with white inner webs, secondaries broadly margined white (forming longitudinal wingbar); tail black, outer two feather pairs conspicuously tipped white; throat and underparts rufous, paler on throat, thighs black and white; underwing-coverts pure white; iris dark brown; bill black, legs dark grey. Differs from all congeners in having uniformly chestnut underparts. Female has upperparts slaty grey, glossed blue-black; otherwise as male, but cheeks and ear-coverts mottled white and grey, white chin spot indistinct, white tip of penultimate rectrix indistinct. Juvenile male is similar to adult female, but has white cheeks, supercilium tinged rusty and continuing to base of bill, feathers of rump and uppertail-coverts, and of much of upperparts, edged rusty, primary coverts tipped white, chin rufous and uniform with underparts, breast with dark brown spots; immature similar to adult female, but not properly described. Voice. A series of 7 staccato, piping notes, the sixth occasionally given as unpiped disyllable.
Habitat. Primary and selectively logged forest, forest edge, open secondary forest, scrub, coastal woodland and mangroves; from sea-level to at least 450 m (Halmahera).
Food and Feeding. Insectivorous; details of food items not recorded. Forages in middle storey to upper canopy, including in trees with little foliage.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Northern Maluku EBA. Moderately common on Halmahera. This species' numbers must have been reduced by forest destruction, but its ability to occupy selectively logged forest suggests that it may not have suffered so serious a reduction as have some other forest species.
Bibliography. Andrew (1992), Coates & Bishop (1997), Hartert (1903), Inskipp *et al.* (1996), Lambert (1994), Mayr & Ripley (1941), Michaux (1998), Strange (2001), Sujatnika *et al.* (1995), White & Bruce (1986).

59. **Black-browed Triller**

Lalage atrovirens

French: Échenilleur papou **German**: Papualalage **Spanish**: Oruguero Cejinegro
Other common names: White-rumped Triller(!); White-browed/Tanimbar Triller (*moesta*)

Taxonomy. *Campephaga (Lalage) atrovirens* G. R. Gray, 1862, Misool, off west New Guinea.
Forms a superspecies with *L. aurea*, *L. leucomela* and *L. conjuncta*. Distinctive race *moesta* sometimes regarded as a separate species, and may be closer to *L. aurea* than to present species; in the absence of vocal and behavioural data, however, it is probably better retained here. Three subspecies recognized.
Subspecies and Distribution.
L. a. atrovirens (G. R. Gray, 1862) – W Papuan Is (Waigeo, Salawati, Misool), and N New Guinea from Vogelkop and Bomberai Peninsula E to region of R Sepik and R Ramu.
L. a. leucoptera (Schlegel, 1871) – Biak I, in Geelvink Bay.
L. a. moesta P. L. Sclater, 1883 – Tanimbar Is.



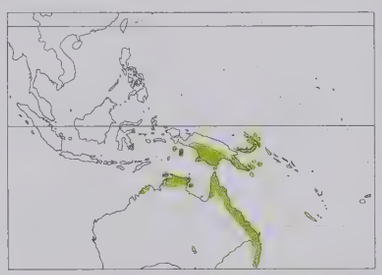
Descriptive notes. 18–19 cm; 31·5 g. Male nominate race has forehead to nape, lores, upper ear-coverts and upperparts black, glossed blue-green; rump white, uppertail-coverts barred black and white; upperwing-coverts black, median and greater coverts broadly tipped white, innermost greaters also margined white; alula, primary coverts and remiges black, tertials broadly edged white; rectrices black, edged greenish, outermost tipped white; lower ear-coverts, cheeks, neck side, throat and entire underparts, including axillaries and underwing-coverts, pure white; iris dark brown; bill black, legs dark grey. Differs from *L. conjuncta* in having more black on greater wing-coverts, no chestnut on lower underparts, no black on thighs; from *L. sueurii* in having less white in wing, no white supercilium. Female is like male, but duller, upperparts dark grey to black, with less gloss, chin and throat white, breast and flanks finely barred black. Juvenile undescribed; immature resembles female. Race *leucoptera* has more white in wing than nominate, female lacks barring on underparts; *moesta* is distinctive, has white supercilium from forehead to eye (often also indicated behind eye), and female resembles male in colour of upperparts and lack of breast and flank barring. Voice. One song comprises sweet, rapidly repeated upslurred "twee" whistles; also has a "see o seet weo", repeated five or six times. Pair-members countersing with sweet "tewhit tewheet wheetu"; also 5–7 notes "reminiscent of laughter".
Habitat. Forest, forest edge, low open forest, secondary growth, scrub, gardens, partly cleared areas, mangroves and sparse littoral woodland; more often in secondary or light forest, or at forest edges, than in primary or tall forest. Mostly lowlands, but in New Guinea locally to 1400 m.
Food and Feeding. Eats fruit and arthropods. Forages singly, in pairs or in small parties; sometimes recorded in mixed-species flocks. Forages in canopy and middle storey, especially at openings, taking small fruits and gleaning from leaves.
Breeding. Juvenile seen in mid-Jun in New Guinea. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Status not well known. Regarded as fairly common in New Guinea, and common in Tanimbar Is (Yamdena).
Bibliography. Andrew (1992), Beehler *et al.* (1986), Coates (1990), Coates & Bishop (1997), Diamond, J.M. (1972, 1985), Inskipp *et al.* (1996), Mack *et al.* (2000), Mayr & Ripley (1941), Mees (1965), Michaux (1998), Rand & Gilliard (1967), Ripley (1964), Strange (2001), White & Bruce (1986).

60. **Varied Triller**

Lalage leucomela

French: Échenilleur varié **German**: Weißbrauenlalage **Spanish**: Oruguero Variable
Other common names: White-browed/Pied Triller(!)/Caterpillar-eater

Taxonomy. *Campephaga Leucomela* Vigors and Horsfield, 1827, south-east Queensland, Australia.
Forms a superspecies with *L. aurea*, *L. atrovirens* and *L. conjuncta*. Last-mentioned often treated as conspecific with present species, but plumage markedly distinct. Fifteen subspecies currently recognized.
Subspecies and Distribution.
L. l. keyensis Rothschild & Hartert, 1917 – Kai Is.
L. l. polygrammica (G. R. Gray, 1858) – Aru Is, and E & S New Guinea (E from Wau and Huon Gulf, S to R Mimika).
L. l. falsa Hartert, 1925 – S Bismarck Archipelago (Umboi, New Britain, Duke of York).
L. l. albidior (Hartert, 1924) – New Hanover.
L. l. karu (Lesson & Garnot, 1827) – New Ireland.
L. l. sumunae Salomonsen, 1964 – Djaul I, off W New Ireland.
L. l. tabarensis Mayr, 1955 – Tabar Is, off N New Ireland.
L. l. ottomeyeri Stresemann, 1933 – Lihir Is (S of Tabar Is).
L. l. triobriandi Mayr, 1936 – Triobriand Is, off E New Guinea.
L. l. obscurior Rothschild & Hartert, 1917 – D'Entrecasteaux Archipelago (Goodenough, Fergusson, Normanby).
L. l. pallescens Rothschild & Hartert, 1917 – Louisiade Archipelago (Misima, Renard, Tagula).
L. l. macrura Schodde, 1989 – NE Western Australia (Kimberleys).
L. l. rufiventris (G. R. Gray, 1846) – N Northern Territory (Arnhem Land) and Melville I, in N Australia.
L. l. yorki Mathews, 1912 – coastal N Queensland (Cape York Peninsula) and islands in Torres Strait; also coastal Trans-Fly region of SC New Guinea.
L. l. leucomela (Vigors & Horsfield, 1827) – coastal E Queensland S to NE New South Wales (Newcastle area).



Descriptive notes. 17–19·5 cm; 24–37·5 g. Male nominate race has prominent white forehead and supercilium, black line through eye to nape, cheeks, ear-coverts and eyelids white; glossy greenish-black on crown and upperparts, rump grey, mottled black, uppertail-coverts grey; lesser upperwing-coverts as back, median coverts white with black bases, greaters black, tipped white (two distinct wingbars), alula and primary coverts black; remiges black, primaries narrowly edged white, secondaries and tertials broadly edged white; rectrices black, tipped white, white broader on outer feathers; throat and underparts greyish-white, finely barred dark (variable), thighs grey, vent and undertail-coverts orange-buff; underwing-coverts and axillaries white, indistinctly barred light grey; iris dark brown; bill black, legs grey. Distinguished from *L. sueurii* and *L. tricolor* in having prominent white supercilium, distinct white wingbars, orange-buff undertail-coverts; from *L. conjuncta* mainly by white supercilium, grey (not white) rump, less white in wing, white (not chestnut) undertail-coverts; from *L. atrovirens* by prominent supercilium, rufous-buff undertail-coverts. Female is like male, but black areas replaced by dark ashy brown, supercilium mottled grey, rump and uppertail-coverts greyer brown with whitish feather fringes, greater upperwing-coverts broadly edged and tipped white, primary coverts tipped white; underparts fawn-buff, barred dusky blackish except on throat and belly, with vent and undertail-coverts as male, underwing-coverts washed fawn. Juvenile is like female, but barred on upperparts, streaked dusky on underparts; immature also like female, but somewhat browner overall, underparts paler buff with broken bars. Races differ in overall colours, rump colour and pattern, and degree of sexual dimorphism: *yorki* is black above, black-mottled grey on rump, unbarred white below, female dusky-grey above and greyish-white below; *rufiventris* is black above, mottle-barred black and grey on rump and uppertail-coverts, grey-white with dark barring below, female greyish-brown above and buff below; *macrura* resembles previous, but undertail-coverts less rich buff; *keyensis* resembles last, but male mottled grey and white on rump, female grey above; *polygrammica* male has vestigial supercilium, black rump with white mottles, strongly barred underparts, female mid-grey above, barred black and white on rump, more richly coloured below, with heavy barring; *falsa* male has ochraceous tinge below extending forwards to central lower breast; *albidior* is similar to previous, but whiter with less barring below; *karu* is also similar, but male differs in having greyer underparts with less extensive rufous, female in having greyer upperparts; *sumunae* male has no rufous on underparts, which have dark barring; *ottomeyeri* male has pure white underparts with virtually no rufous and almost no barring; *tabarensis* is like previous, but has broad white bars on rump and uppertail-coverts, broader supercilium; *obscurior* male is darkish above, rufous-buff on most of underparts; *triobriandi* has grey underparts, with rufous-buff only on undertail-coverts; *pallescens* is similar to last but paler below. Voice. Vocal, with loud, rolling, repeated "brreeer" or "cherwee" call; several individuals may call together to produce widespread chorus; also, repeated "drr-eea".
Habitat. Tropical and subtropical rainforest, monsoon forest, dense eucalypt (*Eucalyptus*) forest, gallery forest and forest edges, also secondary growth, woodland, dense savanna, thickets (e.g.

On following page: 61. St Matthias Triller (*Lalage conjuncta*).

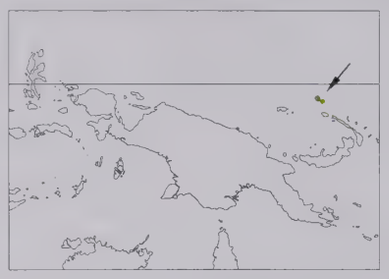
Lantana in Australia) and mangroves; also occurs in gardens. Mainly lowlands, but locally to 1800 m in New Guinea.
Food and Feeding. Feeds on insects, including especially caterpillars (Lepidoptera), also grasshoppers (Orthoptera); fruit, berries and seeds also taken, and is particularly attracted to figs (*Ficus*). Forages mainly in canopy, in pairs or trios; inconspicuous, and seldom associates with other species except at fruiting fig trees. Insect food obtained by gleaning from leaves and twigs, sometimes by sallying, sally-hovering or flutter-chasing.
Breeding. Breeds Sept–Mar in Australia; Sept–Nov in New Guinea, but fledged young also seen Jun–Jul. Nest a very small, shallow cup of dry grass, fine twigs, bark, vine tendrils, plant stalks and rootlets, bound with cobwebs and lined with lichen or rootlets, placed 1–20 m above ground on thin horizontal branch or fork, often among vine foliage. Lays 1 egg; incubation and fledging periods unknown; nestling fed by both parents.
Movements. Sedentary over most of range. In Australia some movement suggested in Queensland, to S coastal plains and adjacent islands, and in New South Wales reported as partially nomadic (probably involving local movements between habitats).
Status and Conservation. Not globally threatened. Fairly common in much of range. Common in Kai Is and fairly common throughout its range in New Guinea and nearby islands; population estimated to be 6 birds/10 ha in one New Guinea rainforest. Considered locally fairly common in N Australia, but rather rare in New South Wales; population densities of 0·08-2·8 birds/ha recorded in N Australia.
Bibliography. Beehler *et al.* (1986), Beruldsen (1980), Blakers *et al.* (1984), Christidis & Boles (1994), Coates (1990, 2001), Coates & Bishop (1997), Diamond (1972), Dutson (2005d), Hall (1974), Higgins *et al.* (2005), Keast (1958), Liddy (1990), Longmore (1978), MacDonald (1988), Mackay (1976), Mayr (1955), Mayr & Rand (1937), Mayr & Ripley (1941), Mees (1982), Morcombe (2000), Panetta (1980), Pizzey (1980), Rand (1942), Rand & Gilliard (1967), Rothschild (1917), Schodde & Mason (1999), White & Bruce (1986).

61. St Matthias Triller

Lalage conjuncta

French: Échenilleur des Saint-Matthias **Spanish**: Oruguero de San Matías
German: St. Matthias-Lalage
Other common names: Mussau Triller

Taxonomy. *Lalage conjuncta* Rothschild and Hartert, 1924, St Matthias Island (= Mussau Island), Bismarck Archipelago. Forms a superspecies with *L. aurea*, *L. atrovirens* and *L. leucomela*. Often treated as conspecific with last-mentioned, but plumage distinct. Monotypic.
Distribution. Mussau I, in St Matthias Group (Bismarck Archipelago).



Descriptive notes. 17–18 cm. Male is black on top of head (including lores and down to below eye) and upperparts; rump white, uppertail-coverts barred black and white; lesser and median upperwing-coverts as back, greater coverts white, innermost greaters with black inner webs; alula and primary coverts black; remiges black, inner edge of primaries white, outer edge of secondaries and tertials white; tail black, outer feathers tipped white; cheeks, ear-coverts, throat and underparts white, thighs black and white, belly to undertail-coverts light chestnut; underwing-coverts white, spotted black near outer edge; iris dark brown; bill and legs black. Differs from *L. leucomela* mainly in lack of prominent white forehead and supercilium, and in having chestnut (not orange-buff) lower underparts; from *L. sueurii* and *L. tricolor* in having white on upperwing-coverts, chestnut belly to undertail-coverts. Female, juvenile and immature undescribed. Voice. Short nasal calls, e.g. "tchu", often repeated in short phrases, e.g. as "tchow-tchow-de-weet".
Habitat. Forest; possibly only in closed forest in hills.
Food and Feeding. No information. Diet probably similar to that of *L. leucomela*. Likely to forage in canopy.
Breeding. No information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Status not properly assessed, as this taxon has usually been considered conspecific with more widespread *L. leucomela*. Population and precise area occupied on Mussau not recorded. Should perhaps be classified as Vulnerable, at best, in view of its very restricted range and the extensive logging that has occurred, and continues, on the island.
Bibliography. Coates (1990), Dutson (2005d), Mayr (1955), Rothschild & Hartert (1924).

PLATE 10 ➤



PLATE 10

inches 4

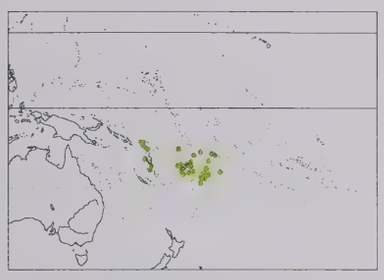
cm 10

62. Polynesian Triller

Lalage maculosa

French: Échenilleur de Polynésie **German**: Südseelalage **Spanish**: Oruguero Polinesio
Other common names: Spotted Triller

Taxonomy. *Colluricincla maculosa* Peale, 1848, Upolu, Samoa.
Sixteen subspecies recognized.
Subspecies and Distribution.
L. m. melanopygia Mayr & Ripley, 1941 – Santa Cruz Is (Utupa, Ndeni).
L. m. vanikorensis Mayr & Ripley, 1941 – Santa Cruz Is (Vanikoro).
L. m. modesta Mayr & Ripley, 1941 – N & C Vanuatu (Espíritu Santo, Malo, Pauuma, Epi).
L. m. ultima Mayr & Ripley, 1941 – C Vanuatu (Efaté I).
L. m. rotumae Neumann, 1927 – Rotuma I (N of Fiji).
L. m. mixta Mayr & Ripley, 1941 – NW & C Fiji Is (Yasawa, Naviti, Yadua, Ovalau, Mathuata, Mathathoni Levu).
L. m. woodi Wetmore, 1925 – N Fiji (Vanua Levu, Kioa, Taveuni, Qamea).
L. m. pumila Neumann, 1927 – SW Fiji (Viti Levu).
L. m. soror Mayr & Ripley, 1941 – SW Fiji (Kadavu).
L. m. nesophila Mayr & Ripley, 1941 – Lau Archipelago (E of Fiji).
L. m. futunae Mayr & Ripley, 1941 – Wallis and Futuna Is.
L. m. maculosa (Peale, 1848) – Samoa (Savai'I, Upolu).
L. m. keppeli Mayr & Ripley, 1941 – Tafahi I and Niuatoputopu I (N of Tonga)
L. m. vauana Mayr & Ripley, 1941 – N Tonga Is (Vava'u Group).
L. m. tabuensis Mayr & Ripley, 1941 – Tonga (except Vava'u Group).
L. m. whitmeei Sharpe, 1878 – Niue I (E of Tonga).



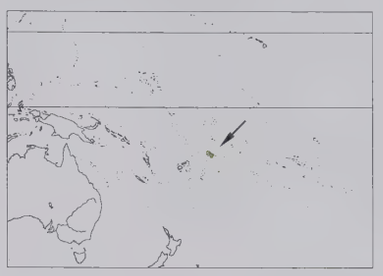
Descriptive notes. 15–16 cm; c. 30 g. Male nominate race has broad white supercilium, black line through eye to nape; neck sides white, almost forming collar on hindneck; top of head and upperparts greenish-black, rump and uppertail-coverts grey, barred buffy white and blackish; lesser upperwing-coverts like back, median coverts white, outermost with black centres, greater coverts black, tipped white, inner ones also broadly edged white; alula and primary coverts black; remiges black, edged white, white broader on secondaries and tertials; rectrices black, tipped white, white broader on outer feathers; cheeks, ear-coverts, throat and underparts, including axillaries and underwing-coverts, white; iris dark brown; bill all bluish-black, or with lower mandible yellow with dark tip; legs grey to black. Differs from *L. leucopyga* in having prominent supercilium, shorter tail. Female is browner than male on upperparts and wings, but top of head greenish-black, contrasting with back; upperpart feathers edged light brown, rump and uppertail-coverts ashy, faintly edged pale buffy and barred black, white margins of remiges and wing-coverts narrow (not forming distinct patch), rectrices brown, tipped white; underparts white, head side, breast side and flanks barred dusky black. Immature is blackish above, crown streaked tawny or white, back feathers sometimes tipped tawny, rump buffy grey, wings dark brown with white areas tinged tawny, tail dark brown, tipped white, white of head and underparts tinged buff and irregularly barred black; juvenile as immature, upperparts with buffy-white feather tips. Races vary considerably in colour and pattern, e.g. Fiji races are browner above and barred below: *futunae* has white-barred blackish rump, more white on upperwing-coverts; *whitmeei* has darker rump, shorter supercilium (not reaching white of neck side); *keppeli* has nape almost white, forming white collar, white feather tips on upperparts, pale grey rump; *nesophila* is like previous, but with less white on back and collar; *vauana* has white streaks on crown, partial white nuchal collar; *tabuensis* is similar to last, but collar more pronounced and feathers of back tipped white; *vanikorensis* is also similar, but smaller, with no collar; *melanopygia* resembles previous, but has blacker upperparts, including rump; *modesta* is larger than last two, with greyer rump, more barring on underparts, buffy wash on breast; *ultima* is larger, with pronounced barring on back, more grey on rump, pure white underparts; *pumila* has head side and underparts washed buffy brown and heavily barred; *soror* is similar but less heavily barred; *rotumae* has underparts washed bright tawny, less strongly barred; *mixta* is more rusty-tinged on upperparts and washed buff on underparts, bars restricted to breast side; *woodi* is more like nominate, but has white-streaked crown, white feather tips on upperparts, heavily barred underparts. Voice. Call is a loud "tchick"; also gives a loud, ringing "peach-it" or "pee-chew" after short flights.
Habitat. Forest and forest edges, from lowlands to mountains; often found also in gardens and parks, and at roadsides.
Food and Feeding. Food insects "and other animals". Often forages on ground. No other information available.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Vanuatu and Temotu EBA, Fiji EBA and Samoan Islands EBA. Current status not well known. Recently thought to be common throughout Vanuatu and Santa Cruz Is. Formerly considered widespread and common on most islands in Fiji (including Rotuma) and Tonga, and on Futuna, Wallis, and the two Samoan islands (Savai'i, Upolu).
Bibliography. Beichle & Baumann (2003), Birchenough *et al.* (2003), Bregulla (1992), Doughty *et al.* (1999), Guyot & Thibault (1988), Holyoak (1979), Mayr (1978), Mayr & Ripley (1941), Michaux (1998), Muse & Muse (1982), Pratt *et al.* (1987), Reed (1980), Rinke (1987), Steadman & Franklin (2000), Steadman & Freifeld (1998), Steadman *et al.* (1999), Watling (1982, 2001).

63. Samoan Triller

Lalage sharpei

French: Échenilleur des Samoa **German**: Braunrückenlalage **Spanish**: Oruguero de Samoa

Taxonomy. *Lalage sharpei* Rothschild, 1900, Upolu, Samoa.
Sometimes placed in a monotypic genus, *Oscarornis*, on grounds of its juvenile-type plumage and lack of sexual dimorphism. Two subspecies recognized.
Subspecies and Distribution.
L. s. tenebrosa Mayr & Ripley, 1941 – Samoa (Savai'i).
L. s. sharpei Rothschild, 1900 – Samoa (Upolu).



Descriptive notes. 13 cm. Distinctive triller. Nominate race has forehead and top of head down to base of eye, and nape, mantle, back and scapulars hair-brown with darker feather shafts; rump and uppertail-coverts darker, more olive-brown; wings blackish-brown, all coverts and remiges narrowly fringed whitish, more buffy to tawny on outer edges of greater coverts and remiges; rectrices hair-brown with pale feather tips; ear-coverts and neck side rufous-buff, barred brown; underparts white, washed buff, and irregularly barred dark brown on side of neck, across breast and on flanks; iris white; bill bright red-orange; legs dark brown. Sexes alike. Juvenile and immature undescribed. Race *tenebrosa* is much darker brown than nominate on upperparts and upperwing, sometimes almost blackish on ear-coverts and neck side, barring on underparts much heavier. Voice. Thin, squeaky, ascending or descending trill, sounding as if forced out with great effort.
Habitat. Primary and secondary forest and forest edge; also occurs rarely in cattle pasture with undergrowth and trees, and in traditional plantations with few permanent houses. From 200 m to above 600 m.
Food and Feeding. Eats fruit and invertebrates. Moves rather slowly, gleaning from leaves of shrubs and small trees. No other information.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Samoan Islands EBA. Generally uncommon. In a 1984 survey, on Upolu, found to be not common in the O le Pupu-pu'e National Park, which is unmanaged and which had been severely damaged by cyclones; the park threatened by logging and cattle farming. This species is almost certainly sedentary, and requires the full and effective protection of primary forest if its future survival is to be secured.
Bibliography. Armstrong (1932), Beichle & Baumann (2003), Beichle & Maelzer (1985), Bellingham & Davis (1998), Collar *et al.* (1994), Elmqvist *et al.* (1994), Mayr & Ripley (1941), Michaux (1998), Muse & Muse (1982), Pratt *et al.* (1987), Reed (1980), Stattersfield & Capper (2000), Watling (1982, 2001).

64. Long-tailed Triller

Lalage leucopyga

French: Échenilleur pie **German**: Langschwanzlalage **Spanish**: Oruguero Colilargo

Taxonomy. *Symmorphus leucopygus* Gould, 1838, "New South Wales"; error = Norfolk Island.
Nominate race extinct. Five extant subspecies recognized.
Subspecies and Distribution.
L. l. affinis (Tristram, 1879) – SE Solomons (San Cristobal, Uki).
L. l. deficiens Mayr & Ripley, 1941 – Torres Is and Banks Is.
L. l. albiloris Mayr & Ripley, 1941 – N & C Vanuatu.
L. l. simillima (F. Sarasin, 1913) – S Vanuatu and Loyalty Is.
L. l. montrosieri J. Verrreaux & Des Murs, 1860 – New Caledonia.



Descriptive notes. 17–18 cm; 16·5–21 g. Male nominate race breeding with forehead, lores, crown, upper ear-coverts and upperparts glossy greenish-black, indistinct white spots on lores; rump white, strongly tinged buff, uppertail-coverts dark grey; wings black, secondaries, tertials and inner primaries narrowly edged white, lesser, median and inner greater upperwing-coverts white; rectrices black, broadly tipped white (except on central pair), white increasing in extent on outer feathers, with outermost white on terminal half; cheeks, lower ear-coverts, throat and entire underparts, including underwing-coverts, white, strongly washed buff, especially on breast and flanks; iris, bill and legs black. Differs from *L. maculosa* in having longer tail, no supercilium, brighter glossy black upperparts. Non-breeding male is browner, with blackish feather centres on head, whitish lores, sandy fringes on uppertail-coverts. Female is similar to non-breeding male, but has upperwing-coverts washed sandy-buff and edged brown, secondaries edged sandy, underparts with vestigial barring on side of breast. Juvenile has buffy barring on crown, mantle and back, brown remiges and rectrices tipped white, some faint brown streaks on throat and breast; immature similar to adult female, but more heavily washed buff on underparts, has white lores, and white on wing washed tawny. Race *montrosieri* is smaller, with rump grey-white, less white on upperwing-coverts, female less deeply buff on rump and underparts; *simillima* is similar to previous but rather smaller, with less white on wing and tail, and with buff on underparts confined to breast, female much darker than previous; *albiloris* is smaller than last, with rump greyer, lores white (often extended to form a supercilium), less white in wing (only median coverts white), often female also has marked supercilium; *deficiens* is like previous, but has less white in tail, and lacks supercilium; *affinis* has rump pure white, white in tail restricted to outer four rectrices, white in wing restricted to median coverts. Voice. Gives a short, rasping call note; loud, melodious song, "tee-zeeia-tee-zeeia-tee-zeeia". Nominate race was reported to give a single harsh chirp.
Habitat. Lowland and mountain forest; commoner at forest edges and in open areas. Probably occurred in all wooded habitats on Norfolk I.

On following pages: 65. Petit's Cuckoo-shrike (*Campephaga petiti*); 66. Black Cuckoo-shrike (*Campephaga flava*); 67. Red-shouldered Cuckoo-shrike (*Campephaga phoenicea*); 68. Purple-throated Cuckoo-shrike (*Campephaga quiscalina*); 69. Western Wattled Cuckoo-shrike (*Lobotos lobatus*); 70. Eastern Wattled Cuckoo-shrike (*Lobotos oriolinus*).

Food and Feeding. No current information available. On Norfolk I (nominate race, extinct) foraged in trees, but also seen to forage in wet grass, perching on stumps and fences before pouncing on insects on the ground; observed also to take insects on the wing.
Breeding. No current information. On Norfolk I bred in Sept, Dec and Feb, Feb clutches apparently second breeding attempt in response to food abundance after heavy rainfall; nest a shallow cup of moss, lichen and fibrous roots, lined with finer material, placed in tree, including introduced pine (*Pinus*); clutch usually 2 eggs, occasionally 3.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Solomon Group EBA, Vanuatu and Temotu EBA and New Caledonia EBA; extinct in Norfolk Island EBA. Common throughout New Caledonia and Vanuatu. Common on the Solomon islands of San Cristobal and Uki, where occurs in Hauta Conservation Area. Nominate race last recorded on Norfolk I in 1942, despite its apparent abundance in 1941; predation by newly arrived black rats (*Rattus rattus*) probably the main cause of extinction, but disappearance also coincided with habitat loss after forest clearance for an airport.
Bibliography. Birchenough *et al.* (2003), Bregulla (1992), Christidis & Boles (1994), Doughty *et al.* (1999), Hermes (1985), Mayr (1955, 1978), Mayr & Ripley (1941), Michaux (1998), Schodde & Mason (1999), Vuilleumier & Gochfeld (1976).

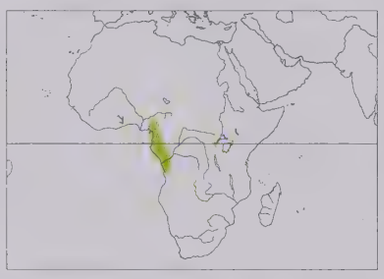
Genus *CAMPEPHAGA* Vieillot, 1816

65. **Petit's Cuckoo-shrike**

Campephaga petiti

French: Échenilleur de Petit **German**: Kongoraupenfresser **Spanish**: Oruguero de Petit

Taxonomy. *Campephaga petiti* Oustalet, 1884, Cacongo (Landana), Cabinda, Angola.
Forms a superspecies with *C. flava* and *C. phoenicea*. Possible hybridization with first of those in NW Angola and E DRCongo (L Kivu) suggested by observations of females or young males having barred underparts with strong yellow wash. Monotypic.
Distribution. SE Nigeria and SW Cameroon S to NW Angola; also NE DRCongo, adjacent SW Uganda and W Kenya.



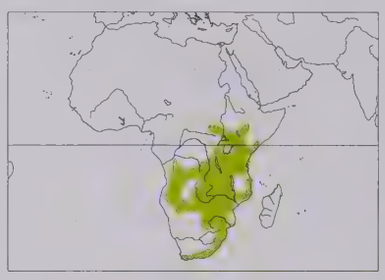
Descriptive notes. 20 cm; 26–37 g. Male is black with greenish-blue gloss (forehead, belly, thighs and underwing-coverts unglossed); rectrices and remiges edged greenish-blue; iris deep brownish-black; bill black, large yellow or orange gape wattles; legs black. Distinguished from *C. flava* by larger gape wattles, black (not olive-black) underwing-coverts, never any yellow on upperwing-coverts; from *C. phoenicea* by lack of coloured "shoulder" patch; from very similar *C. quiscalina* by lack of purple gloss on breast and head side, larger gape wattles. Female is very different, has buff supercilium, blackish-brown lores and streak behind eye, white broken eyering, olive ear-coverts streaked pale yellow or white; top of head to upper mantle olive-green, lower mantle to uppertail-coverts olive-yellow, barred black, upperwing-coverts black, fringed yellow, flight-feathers black, edged yellow; central four rectrices olive-green, tipped yellow, other rectrices blackish, edged olive, and with yellow at tip becoming more extensive until outermost almost entirely yellow; chin and upper throat white or pale yellow, underparts rich yellow with variable amount of dark barring on side of breast and neck, yellow underwing-coverts and axillaries. Juvenile is similar to female, but top and side of head dark green with indistinct blackish bars, mantle and upper back olive-green, barred blackish, rest of upperparts yellow, barred black, underparts yellow, spade-shaped spots on side of neck, breast, flanks and undertail-coverts; immature not fully described. Voice. Short whistled "seep". Song a high-pitched "psiuu, tsi-tsi"; also high, scratchy warbling "sueet-sueet, siueet-seet-seet-sireet".
Habitat. Moist primary and secondary forest, including secondary growth, gallery forest and forest patches in savanna; in Uganda (Kibale Forest), commonest in logged areas with dense undergrowth and sparse canopy. Ecologically segregated by forest habitat from *C. phoenicea* in areas of range overlap. Mainly at 1000–2000 m, but also near sea-level.
Food and Feeding. Eats caterpillars (Lepidoptera), also flying insects and grasshoppers (Orthoptera). Forages unobtrusively in foliage of higher and middle canopy, also sometimes in undergrowth.
Breeding. Breeds in Feb–May in DRCongo and Jun in Uganda; courtship noted in Jun–Jul in Kenya; birds in breeding condition in Jul in Gabon and Sept in Angola. One nest (Uganda) was a cup of lichens and mosses, placed c. 13 m up on branch fork near top of a forest tree. No other information.
Movements. Recorded as absent from Kivu, in E DRCongo, in Jul–Nov, possibly indicating some movements.
Status and Conservation. Not globally threatened. Poorly known. Regarded as generally uncommon to locally frequent; locally common in W Kenya (Kakamega). This species' numbers have presumably been reduced by forest destruction, but in Uganda it is known to survive well in logged forest.
Bibliography. Ash *et al.* (1989), Bannerman (1953), Bennun & Ngoroje (1999), Borrow & Demey (2001), Buckley & McNeilage (1989), Byaruhanga *et al.* (2001), Chapin (1953), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette & Prévost (1987), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Prigogine (1980a), Sekercioglu (2002), Skorupa (1982), Vande weghe (1988), Zimmerman *et al.* (1996).

66. **Black Cuckoo-shrike**

Campephaga flava

French: Échenilleur à épaulettes jaunes **Spanish**: Oruguero Hombroamarillo
German: Mohrenraupenfresser
Other common names: African Black Cuckoo-shrike

Taxonomy. *Campephaga flava* Vieillot, 1817, South Africa.
Forms a superspecies with *C. petiti* and *C. phoenicea*. Possible hybridization with *C. petiti* in NW Angola and E DRCongo (L Kivu) is suggested on the basis of observations of females or young males having barred underparts with a strong yellow wash. Where breeding range overlaps with that of *C. phoenicea* (in SW Ethiopia and W Kenya), no intermediate males have been reported; some females of present species from C & E Kenya (outside range of *C. phoenicea*) have yellow in tail intermediate in extent between typical females of the two species; in areas where males and females of both species occur, all three female tail patterns are found, but differences are not clearly enough defined to point to further intergradation, although interbreeding may indeed occur. Monotypic.
Distribution. S Sudan and SW Ethiopia S to Uganda, Kenya and S Somalia, thence S to S DRCongo, Angola, N Namibia, N & E Botswana and N South Africa and Swaziland, S along coast to Western Cape.



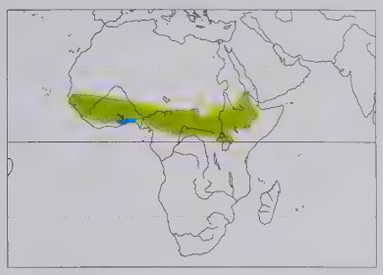
Descriptive notes. 19–22 cm; 27–40 g. Male is black, glossed greenish-blue; often has yellow lesser upperwing-coverts forming patch at bend of wing; iris blackish; bill black, gape yellow; legs black. Distinguished from very similar *C. petiti* by smaller yellow gape, from *C. quiscalina* by lack of purple gloss on face, neck and underparts, and by yellow (not orange) gape, from both also by yellow on wing (when present); "yellow-shouldered" male differs from very similar *C. phoenicea* in having normally smaller, less orangey patch confined to lesser coverts, although a few individuals may not be distinguishable. Female is very different, olive-green to olive-brown above, but rump and uppertail-coverts grey or brown with black bars that extend variably to back and scapulars; whitish supercilium, black streak through eye; flight-feathers and wing-coverts edged or fringed yellow, tail blackish-brown, outer feather pair yellow except for base of inner web; white with blackish bars and crescentic marks below, yellow wash on breast side often extending across breast and on to flanks, bright yellow underwing-coverts. Juvenile is similar to female, but entire head and upperparts barred blackish, underparts more heavily and broadly barred, bars becoming spade-shaped on belly; immature very similar to adult. Voice. Often silent, but sometimes a high-pitched, penetrating, insect-like trill, "krrreee", lasting c. 1 second, when foraging or in flight. Other calls include lower-pitched, downslurred "chweeu" or "kreeu", short "chip", "chup" or "tsip", hissing "sseeu", also a repeated unmusical "chwrr" as alarm, also a soft, repeated "seeu", a quiet peeping when foraging, and various squeaks.
Habitat. Can occur in virtually any woodland or forest habitat, from acacia (*Acacia*), mopane (*Colophospermum mopane*) and brachystegia (*Brachystegia*) woodland to riparian forest, the edges of evergreen forest and secondary growth; less commonly in savanna, scrub, semi-arid bush, gardens and exotic plantations. In E Africa occurs in forest from sea-level to 1800 m, breeding above 900 m; in SC Africa breeds mainly in woodland at 1000–2000 m, but occurs in riverine and forest habitats down to 50 m outside breeding season; breeds near sea-level in Cape region. In areas of geographical overlap with *C. petiti*, largely ecologically separated by its preference for woodland and forest edge, rather than true forest. In areas of overlap with *C. phoenicea* both species recorded in variety of habitats, including juniper (*Juniperus*) forest in S Ethiopia, but present species usually in less thick vegetation.
Food and Feeding. Food primarily insects, mainly lepidopterans (especially caterpillars, including hairy ones), also termite alates (Isoptera), and orthopterans, including katydids (Tettigoniidae); also eats spiders (Araneae) and ants (Hymenoptera); fruit and tree seeds also taken. Normally forages within and at edge of canopy, occasionally on the ground. Usually moves quickly from tree to tree; often joins mixed-species parties. Forages by searching leaves, bark and lichens; prey caught in fluttering hops, sometimes (e.g. termite alates) in short flights; sometimes hovers to pick prey from leaves.
Breeding. Breeds mainly during rains: in Apr in Ethiopia, Mar–May in Kenya, Dec–Feb and Apr–May in Tanzania, Oct in Zanzibar; Oct–Jan in SE DRCongo, Zambia and Malawi, Sept–Feb in Zimbabwe, Sept–Jan in Mozambique, Nov in Botswana; Oct–Jan, rarely Sept and Feb, in South Africa. Monogamous; territorial. In apparent courtship display, a pair called with trills and the male performed fluttering, moth-like flight with the tail depressed, after which the female joined the male, flicking her wings. Nest built by female, accompanied by male, a small shallow cup of moss, leaf petioles, lichen and bearded lichens (*Usnea*), lined with fine fibres, hair and leaf midribs, and bound with spider webs; moulded into flat fork or saddle, usually 5–18 m up in tree, often far out on branch, and easily overlooked. Eggs 1–3, usually 2; incubation by female only, period 20 days; male feeds female and defends area near nest; chicks fed by both parents, fledge at 20–23 days.
Movements. Resident, nomadic or migratory. Local appearances often irregular. In S Africa, breeds in plateau country from Sept/Oct and then moves to lower altitudes from Apr/May onwards; movements apparently influenced by rainfall, fewer birds moving away from breeding areas in wet years. Many move N to equator after breeding; mainly a non-breeding visitor to Kenya, N Tanzania, Uganda and Rwanda in Apr–Sept, Somalia Jun–Oct and S Sudan during rains. In S Africa, post-breeding movements appear to be E, probably into Mozambique and major valley systems (such as that of R Zambezi). Some "overwintering" recorded in Zambia (E of 25° E) and NE South Africa; occurs in S coastal regions throughout year. Attracted to lights at night in SE Kenya (Ngulia) during Nov–Jan.
Status and Conservation. Not globally threatened. Widespread; probably common but status difficult to ascertain, as probably under-recorded owing to its unobtrusiveness. Generally regarded as uncommon to frequent, and seasonally common in Kenya, Zambia, S Mozambique and N South Africa; in last-mentioned, density 1 pair/30 ha. No information on any change in overall distribution, but numbers have probably declined as a result of widespread destruction of woodland and forest throughout its range. Species is apparently relatively undisturbed by presence of humans, as it forages and nests in gardens. Occurs in a large number of protected areas over its extensive range.
Bibliography. Anon. (2001a), Ash & Miskell (1983), Backhurst & Pearson (1977), Benson & Benson (1977), Brewster (1998), Britton (1973), Brooke (1970), Byaruhanga *et al.* (2001), Campbell (1998), Chapin (1953), Clancey (1964, 1971, 1976), Crouch (1997), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Ginn *et al.* (1989), Hall & Moreau (1970), Hanmer (1985), Harrison *et al.* (1997), Herremans (1998), Irwin (1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Macdonald (1984a), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993), Mlingwa (2000), Monadjem (1996, 2001a, 2002a, 2002b), Nikolaus (1987), Oatley (1969), Pakenham (1979), Patten (1999), Penry (1994), Prigogine (1972), Sinclair & Hockey (1996), Skead (1966), Skinner (1995), van Someren (1956), Steyn (1996), Symes *et al.* (2002), Tarboton (1980, 2001), Tarboton *et al.* (1987), Vande weghe (1988), Vincent (1949), Zimmerman *et al.* (1996).

67. **Red-shouldered Cuckoo-shrike**

Campephaga phoenicea

French: Échenilleur à épaulettes rouges **Spanish**: Oruguero Hombrorrojo
German: Rotschulter-Raupenfresser

Taxonomy. *Ampelis phoenicea* Latham, 1790, Gambia.
Forms a superspecies with *C. petiti* and *C. flava*. Where breeding range overlaps with that of latter (in SW Ethiopia and W Kenya), no intermediate males known; extralimitally (in C & E Kenya), some females have extent of yellow in tail intermediate between that shown by present species and that of typical *C. flava*, suggesting possible incomplete genetic isolation. Monotypic.
Distribution. Extreme S Mauritania, Senegal and Gambia E to S Chad, S Sudan, Ethiopia and Eritrea, S to Sierra Leone, N Ivory Coast, SE Ghana, SE Cameroon, N PRCongo, N DRCongo, Uganda and extreme W Kenya.



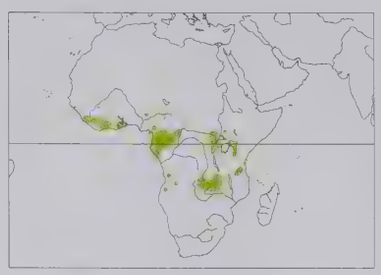
Descriptive notes. 20 cm; 23–35·5 g. Male is black, glossed greenish-blue, with red, orange or orange-yellow lesser and median upperwing-coverts ("shoulder" patch); iris black, dark brown or grey; bill black, gape yellow; legs black. Distinguished from most congeners by orange or red wing-covert patch; from very similar *C. flava* possessing yellow lesser coverts by fact that patch on present species is larger, but a few individuals may not be distinguishable. Female is brown to grey-brown above, black barring on rump and uppertail-coverts (sometimes extending to back and scapulars), pale grey supercilium contrasting with dark lores and line through eye; flight-feathers and wing-coverts edged or fringed yellow, tail brownish-black, outer rectrices tipped and edged yellow; white with black bars and crescentic marks below, breast side and flanks variably washed yellow, bright yellow underwing-coverts. Juvenile is similar to female, but upperparts barred black, outer tail feathers striped dark and yellow, underparts more heavily barred than adult, bars tending towards spade-shaped blotches on belly; immature not fully described. Voice. Mainly silent. Song, often as duet, a jumble of high-pitched whistles, squeaks and churrs, reminiscent of a "good-quality" song of sunbird (Nectariniidae), continuing for 5–10 seconds. Calls include clear, loud whistle, "heew" or "huu-tseew", burbled "t-chew" or "ti-chulu" notes in flight, often repeated, and short "tsuck"; contact call a sharp, repeated "tchit" or "tchit-tchiwi-tchiwi".
Habitat. Forest patches, including edges and clearings, gallery forest, moist secondary growth, wooded grassland and thickets in savanna. Usually in thicker vegetation than that occupied by *C. flava* in E Africa, but both species recorded in variety of habitats, including juniper (*Juniperus*) forest in S Ethiopia. From sea-level to c. 1600 m. In areas of geographical overlap with *C. petiti*, ecologically separated by its preference for woodland and forest edge, rather than true forest.
Food and Feeding. Eats caterpillars (Lepidoptera) and other insects, especially orthopterans and bugs (Hemiptera). Keeps to upper or middle storeys; occasionally lower (W Africa) or in bushes and small trees (E Africa), between which it flies in low undulating flight. Forages quietly, mainly within foliage, by gleaning from leaves, twigs and branches; sometimes takes prey on the ground and in flycatching sallies. Occasionally joins mixed-species flocks.
Breeding. Breeds during rains, May–Sept in Nigeria, Jul in W Sudan (Jun in S) and Mar–Apr in Uganda; carrying nesting material in Aug in Gambia; nest-building in Jun in Kenya. Monogamous. Nest a small, shallow cup of moss and lichens, bound with spider webs, c. 10 m up and well concealed in fork of leafless tree. Two clutches each contained 2 eggs. No other information.
Movements. Migratory in W Africa (E of c. 8° E) and in Sudan, moving N to breed during rains and returning to edge of forest belt at lower latitudes in dry season; in Nigeria occurs in S guinean zone all year, but moves N to Zaria in May–Nov and S to coast Nov–Apr; resident in Uganda, with population increase Jan–Apr probably involving non-breeding migrants from N tropics. Elsewhere, apparently sedentary or nomadic. Vagrant in W DRCongo (near Lukolela) and NE Rwanda.
Status and Conservation. Not globally threatened. Widespread, and uncommon to locally common. No information on effects of habitat loss, but this species' numbers may have been reduced by forest destruction.
Bibliography. Bannerman (1953), Barlow *et al.* (1997), Benson *et al.* (1971), de Bie & Morgan (1989), Bobo *et al.* (2005), Borrow & Demey (2001), Britton (1973), Byaruhanga *et al.* (2001), Chapin (1953), Crisler *et al.* (2003), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fry (1980), Giraudoux *et al.* (1988), Gore (1990), Grimes (1987), Hall & Moreau (1970), Hutchins *et al.* (2002), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Macdonald (1984b), Mackworth-Praed & Grant (1960, 1973), Nikolaus (1987), Pearson (1990), Thiollay (1998), Turner (1991), Vernon (1980), Williams (1992), Zimmerman *et al.* (1996).

68. **Purple-throated Cuckoo-shrike**

Campephaga quiscalina

French: Échenilleur pourpré **German**: Purpurraupenfresser **Spanish**: Oruguero Purpúreo

Taxonomy. *Campephaga quiscalina* Finsch, 1869, Fanti, Ghana.
Three subspecies recognized.
Subspecies and Distribution.
C. q. quiscalina Finsch, 1869 – Sierra Leone, S Guinea, N Liberia, S Mali, Ivory Coast, C Ghana, W Togo, C Nigeria, W & SW Cameroon and SW Central African Republic S to PRCongo and Angola.
C. q. martini (Jackson, 1912) – S Sudan, NE & SE DRCongo, C Uganda, W Kenya and Zambia.
C. q. munzneri Reichenow, 1915 – E Tanzania.
Descriptive notes. 20 cm; male mean 39·7 g, female 30–43 g. Male nominate race is black, glossed steel-blue, but with purple gloss on ear-coverts, cheeks, underwing-coverts and axillaries, and from chin to breast, and blue-purple on hindneck and belly; secondaries, tertials and upperwing-coverts edged glossy blue, rectrices edged steel-blue; iris dark brown or red-brown; bill black, gape yellow to orange; legs dark brown to blackish. Distinguished from very similar *C. petiti*, and from *C. flava* and *C. phoenicea*, by strong purple gloss on face, throat and breast. Female has grey-white supercilium, black streak from lores through eye, white broken eyering, white streaks on cheeks and ear-coverts; top of head to upper mantle grey, rest of upperparts, including scapulars, yellowish-green; wings brown, feathers edged green; rectrices brown, washed green, outer four with yellow tips, yellow becoming broader outwards, outermost rectrix entirely yellow on outer web and fringe of inner web; chin and throat white, underparts bright yellow to orange-yellow,



underwing-coverts and axillaries yellow; no noticeable bright colour at gape. Juvenile is like female, but top of head browner, head, upperparts, upperwing-coverts and tertials variably barred black and white, chin and throat pale grey, underparts yellow with dark barring, bars becoming narrower with age; immature not fully described. Race *martini* has dusky grey barring on upper breast of female; *munzneri* is like previous, but throat of male glossed steel-blue. Voice. Song a rather fast series of melodious whistles, "slueet-slueet-swit-wit-slueet-slueet-swit-wit-tluw-tluweew"; contact call "whit-whit-whit" or "tsee-up"; young near nest give high-pitched, penetrating "tseeoo".
Habitat. Moist primary and secondary evergreen forest, especially edges and clearings; also found in gallery forest, riparian forest, dry evergreen forest, coffee forest, forest patches in savanna, and regenerating forest including adjacent scattered trees, shrubs and bushes. Mainly lowlands, but to 1500 m in Zambia; in Kenya occurs only at 1500–2500 m.
Food and Feeding. Food insects, mainly lepidopterans (especially caterpillars, also adult moths), orthopterans, bugs (Hemiptera, including cicadids) and hymenopterans; also takes spiders (Araneae). Forages unobtrusively in canopy; sometimes joins mixed-species flocks. Searches creepers and foliage, and catches prey under leaves and on trunks.
Breeding. Breeds during and at end of rains, in Aug, Nov and Dec in Gabon, Mar and Sept in Angola, May, Jul and Aug in DRCongo, Apr–May in Sudan, Jun, Oct and Dec in Kenya and Nov and Jan in Zambia. Monogamous; probably territorial. Nest built by female, accompanied by male, a small, shallow cup of lichens, bound with spider webs and lined with fine fibres and moss, secured to horizontal tree branch 6–30 m above ground. Eggs 2; incubation by female only, male guards nest in her absence, period 20 days; chicks fed and brooded initially by female, later fed by both parents, leave nest at 22 days.
Movements. None recorded; sedentary at least in Gabon and Zambia.
Status and Conservation. Not globally threatened. Uncommon to frequent throughout most of its range; locally common in Kenya, Zambia and Angola. As with its congeners, this species' numbers have probably declined as a result of the destruction of its forest habitats; present distribution fragmented, with populations present in surviving evergreen forest in equatorial and SC Africa. Occurs in a number of protected areas, including e.g. Taï Forest National Park and Lamto Research Station, in Ivory Coast.
Bibliography. Bannerman (1953), Bennun & Ngoroje (1999), Benson *et al.* (1971), Brosset (1972), Brosset & Érard (1986), Burgess & Mlingwa (2000), Byaruhanga *et al.* (2001), Chapin (1953), Cheke & Walsh (1996), Dean (2000), Demey (1999), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool (1993), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Hamel (1980), Jackson, C. (1997), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963, 1973), Madge (1972), Muriuki *et al.* (1997), Nikolaus (1987), Pearson (1990), Prigogine (1980a), Scott (1996), Wilson & Wilson (1994), Zimmerman *et al.* (1996).

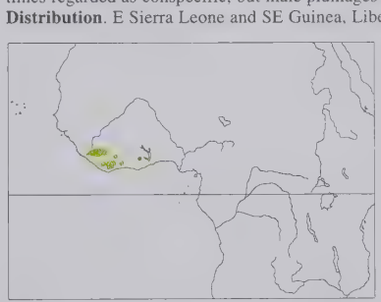
Genus *LOBOTOS* Reichenbach, 1850

69. **Western Wattled Cuckoo-shrike**

Lobotos lobatus

French: Échenilleur à barbillons **Spanish**: Oruguero Carunculado
German: Westlicher Lappenraupenfresser
Other common names: Ghana Cuckoo-shrike; Wattled Cuckoo-shrike (when treated as conspecific with *L. oriolinus*)

Taxonomy. *Ceblepyris lobatus* Temminck, 1824, Sierra Leone; error = Ghana.
Genus often merged with *Campephaga*, but separation appears justified on basis of colourful plumage, facial wattles, and sexual plumage similarity. Forms a superspecies with *L. oriolinus*; sometimes regarded as conspecific, but male plumages distinct. Monotypic.
Distribution. E Sierra Leone and SE Guinea, Liberia, Ivory Coast and SW Ghana.



Descriptive notes. 19–21 cm; 29–37 g. Male has glossy blue-black head, nape and throat, large orange gape wattles, narrow yellow collar; olive-yellow upperparts becoming orange-chestnut on rump; alula and flight-feathers black, yellow edges of secondaries and tertials; black tail with green centre and yellow corners; orange-chestnut breast, shading to yellow on undertail-coverts; yellow underwing; iris dark brown to red-brown; bill and legs black. Differs from *L. oriolinus* in having orange-chestnut rump, deeper orange-yellow underparts. Female is duller, with no gloss on head, no yellow collar, olive-green upperparts, underparts entirely yellow, gape wattles smaller; virtually indistinguishable from female *L. oriolinus*. Juvenile is similar to female, but upperparts and underparts with slight dark barring, flight-feathers and greater upperwing-coverts tipped white, tail feathers narrower and more pointed than adult; immature not fully described. Voice. Mainly silent and inconspicuous, with "zit" or "tsik" flight call.
Habitat. Upper guinean forest zone, in canopy of primary forest or tall lowland rainforest, often near rivers, and in open swamp-forest. Also recorded in logged, disturbed and managed forest; also in *Terminalia ivorensis* plantations in Ivory Coast.
Food and Feeding. Diet includes caterpillars (Lepidoptera), grasshoppers (Orthoptera), mantids (Mantodea) and seeds. Generally perches in dense, high foliage, typically 20–50 m above the ground. Often joins mixed-species parties.
Breeding. Birds in breeding condition in Feb and Aug–Nov in Liberia. No other information.
Movements. None recorded.

Status and Conservation. VULNERABLE. Restricted-range species: present in Upper Guinea Forests EBA. Local, and generally rare to uncommon. Although this species has apparently adapted to secondary and disturbed forest habitats, and is known to breed in mature logged forest, it must be seriously threatened by massive forest destruction throughout its restricted and fragmented range of 300,000 km². Population may be declining rapidly: surveys at Gola Forest, in Sierra Leone, in 1988–1989 indicate a serious decline and occurrence at very low densities. In Liberia, where forests under intense and increasing pressure from commercial logging, settlement and smallholder agriculture, it is locally rare to uncommon, with estimated minimum of 20,000 pairs in 1997. In Ivory Coast, sightings in Taï Forest National Park, one of the largest and best-preserved areas of upper guinean forest, suggest that it is secure there. Very few 20th-century records from Ghana. Unconfirmed 1988 report from SE Nigeria (Ikpan) probably refers to *L. oriolinus*.

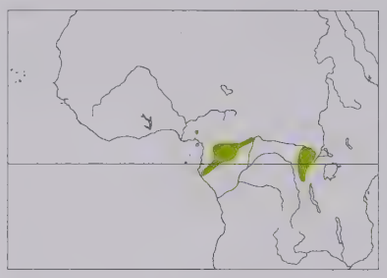
Bibliography. Allport (1991), Allport *et al.* (1989), Ash *et al.* (1989), Bannerman (1953), Borrow & Demey (2001), Brosset & Érard (1986), Chapin (1953), Collar & Andrew (1988), Collar & Stuart (1985, 1988), Collar *et al.* (1994), Colston & Curry-Lindahl (1986), Demey & Fishpool (1991), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Gartshore (1989, 1991), Gartshore & Carson (1989), Gartshore *et al.* (1995), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Keith *et al.* (1992), Prigogine (1953), Stattersfield & Capper (2000), Wood (1993).

70. Eastern Wattled Cuckoo-shrike

Lobotos oriolinus

French: Échenilleur loriot **German**: Östlicher Lappenraupenfresser **Spanish**: Oruguero Oriolino
Other common names: Oriole Cuckoo-shrike; Wattled Cuckoo-shrike (when treated as conspecific with *L. lobatus*)

Taxonomy. *Lobotus* [*sic*] *oriolinus* Bates, 1909, Assobam, River Bumba, Cameroon.
Genus often merged with *Campephaga*, but separation appears justified on basis of colourful plumage, facial wattles, and sexual plumage similarity. Forms a superspecies with *L. lobatus*; sometimes regarded as conspecific, but male plumages distinct. Monotypic.
Distribution. S Cameroon, SW Central African Republic, N PRCongo and Gabon, also E DRCongo; unconfirmed report from SE Nigeria (Ikpan).
Descriptive notes. 19 cm. Male has glossy blue-black head, nape, throat and upper breast, large orange gape wattles; bright yellow on upper mantle, becoming yellowish-green on lower mantle, back, scapulars and upperwing-coverts, yellower green on rump and uppertail-coverts; alula and flight-feathers black, white edges of primaries, yellow edges of secondaries, yellowish-green outer



webs of tertials; black tail with green centre and yellow corners; lower breast to undertail-coverts bright saffron-tinged yellow; iris dark brown; bill and legs black. Differs from *L. lobatus* in having yellow-green rump and uppertail-coverts, paler and yellower (less orange) underparts. Female is duller, with green wash on head, no saffron wash on underparts, smaller gape wattles; virtually indistinguishable from female *L. lobatus*. Juvenile male is similar to adult female, but has dull yellow frontal band, dull green forehead to forecrown, bluish-green supercilium and ear-coverts, blackish lores, indistinct pale eyering, buff chin, greenish-grey throat, bluish-green neck side and lower throat, faint dark barring on upperparts (including scapulars and upperwing-coverts) and underparts, white tips of greater and primary coverts, more pointed tail feathers; juvenile female undescribed; immature not fully described.
Voice. Mainly silent and inconspicuous, with "zit" or "tsik" flight call.
Habitat. Primary, secondary and transition forest at low altitudes; recorded also from edge of logged forest in Gabon. Most W African records are from near rivers, from sea-level to 700 m; occurs at 850–1300 m in E DRCongo.
Food and Feeding. Eats small caterpillars (Lepidoptera), grasshoppers (Orthoptera) and other insects. Frequents canopy of mature trees; often follows mixed-species parties of insectivores. Forages in manner of a flycatcher (Muscicapidae), sallying from a perch to take insects from under leaves.
Breeding. Laying dates Dec–Jan, Apr–Jun and Aug in DRCongo. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Data-deficient. There are very few documented sightings of this unobtrusive species, which is regarded as uncommon to very rare throughout its potentially wide range. An unconfirmed 1988 report of *Lobotos* from SE Nigeria (Ikpan) probably refers to this species. Reasons for its rarity unclear; it is thought not to be immediately threatened by habitat loss, as it appears to prefer secondary forest.

Bibliography. Bannerman (1953), Brosset & Érard (1986), Chapin (1953), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1998a), Elgood *et al.* (1994), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Languy *et al.* (2005), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1973), Pedersen (2000), Sinclair & Ryan (2003).

PLATE 11 ➤



PLATE 11

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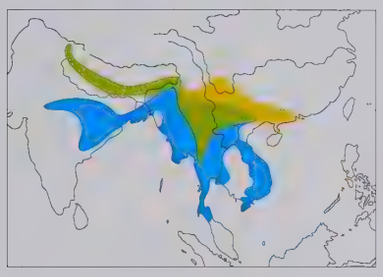
Genus *PERICROCOTUS* Boie, 1826

71. **Rosy Minivet**

Pericrocotus roseus

French: Minivet rose **German**: Rosenmennigvogel **Spanish**: Minivet Rosado

Taxonomy. *Muscicapa rosea* Vieillot, 1818, Bengal, India.
Forms a superspecies, and sometimes considered conspecific, with *P. cantonensis* and *P. divaricatus*. Is, however, very distinct from latter morphologically and differs also in moult and migration strategies. Apparently interbreeds with *P. cantonensis* in S China (S Guangdong), where a small, possibly now stable, population with mixed characters occurs in Xijiang Valley (this population was initially described as a separate species, *P. stanfordi*, and subsequently often regarded as a race of present species); no sign that the two hybridize in region where ranges closely approach each other or overlap elsewhere in S China, and zone of occurrence of "*stanfordi*" is sufficiently restricted to suggest that the parent forms now behave as separate species; further study required. Monotypic.
Distribution. N Pakistan E to NE India (E to Assam, Manipur and Nagaland), S China (SW Sichuan, W, S & SE Yunnan, Guizhou, Guangxi, SW Guangdong), Myanmar (S to N Tenasserim) and NW Vietnam (Tonkin); non-breeding S to C India and SE Asia (including Thailand, Laos and S Vietnam).



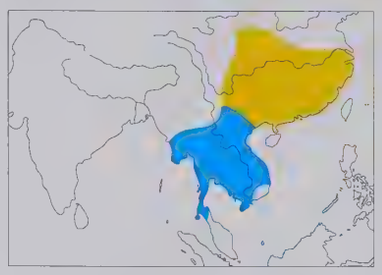
Descriptive notes. 18–20 cm; 14–19 g. Male has whitish forehead, supraloral stripe and eyelids, black lores, pale grey face to ear-coverts; crown to upper back and scapulars brownish-grey to grey, lower back to uppertail-coverts tending to pale rosy, uppertail-coverts tipped vermilion (with age, red of rump and uppertail-coverts may become brighter and upperparts more uniformly grey); wings greyish-black, greater upperwing-coverts tipped vermilion, merging into bright vermilion basal bands on remiges, these running obliquely across wing (extending farther along primaries than along secondaries), distal outer webs of tertials and inner secondaries vermilion; central pair of rectrices black-brown, second pair vermilion on outer web, remainder largely vermilion; chin and throat white, washed pink, underparts (including axillaries and underwing-coverts) pink; hybrid ("*stanfordi*") has pale pink forecrown, often pinkish on outer rectrices and wing markings, reddish tinge on rump, pink tinge on underparts; iris dark brown; bill and legs black. Differs from other red species of genus in lack of black on head, chin and throat, and pink (not red) underparts. Female is similar in pattern to male, but upperparts olive-tinged grey, back to uppertail-coverts often paler olive-yellow with yellower feather tips, secondary coverts tipped and edged yellow; wing flash also yellow, tail predominantly yellow; underparts dull yellow; hybrid ("*stanfordi*") has yellow wing markings, yellow in tail, yellow tinge on uppertail-coverts. Juvenile resembles female, but more brownish, with pale yellowish feather tips on head and upperparts, obscure dark scaling or mottling on breast; immature like female. Voice. Has a whirring trill (Thailand), a squeaky, whistling "whiririri-whiririri-whiririri" (India), and a twitter followed by longer, upslurred whistle (Assam).
Habitat. Inhabits many different types of forest, including broadleaf evergreen, deciduous and pine (*Pinus*), but also woodland, wooded valleys and gardens; sometimes occurs in towns. From 300 m to 1800 m. Migrants typically winter in slope forests (evergreen and deciduous), ranging out below hills to groves and clumps of woodland, and into plains-level cultivation with scattered trees.
Food and Feeding. Insects and other small arthropods. Commonly recorded in pairs, but often occurs in flocks in non-breeding season. Forages in canopy and subcanopy foliage; less active than other minivets.
Breeding. Apr–Jun in India; Apr in Myanmar. Nest built mainly by female, accompanied by male, a small, neat, deepish cup of roots, twigs, grass stems, lichens and cobwebs, placed 3–10 m above ground on horizontal tree branch. Eggs 2–4. No other information.
Movements. Resident and partial migrant. Migrants present in breeding areas mainly Apr–Oct; some possibly resident in Himalayas and NE India. Passage recorded in NE India (S Assam hills) and Bangladesh. Hybrid population ("*stanfordi*") breeding along R Xijiang in S China (S Guangdong) occurs on migration and in winter in E Thailand and S Laos. Vagrants recorded in S peninsular Thailand (five records, Dec) and Hong Kong.
Status and Conservation. Not globally threatened. Fairly common to common in Myanmar and China. Generally rare in Indian Subcontinent; local and uncommon in W Himalayas, rare and very local in Pakistan, rare in Bhutan; rare in Royal Chitwan National Park, in Nepal; occurs in Dibru-Saikhowa National Park, in NE India. Reported occurrence in E Afghanistan uncorroborated. In non-breeding season, fairly common visitor in Thailand, Laos and Cochinchina; occurs in Khao Yai National Park, in Thailand.
Bibliography. Ali & Ripley (1996), Cheng Tsohsin (1987), Deignan (1945), Dickinson & Dekker (2002a), Duckworth *et al.* (2002), Eames & Ericson (1996), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Hawa (1985), Herklots (1967), Inskipp & Inskipp (1991), Inskipp *et al.* (1996), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Ripley (1982), Roberts (1992), Robson (2000), Smythies (1986), Wells (2005), Zheng Guangmei & Zhang Cizu (2002).

72. **Swinhoe's Minivet**

Pericrocotus cantonensis

French: Minivet de Swinhoe **German**: Fahlbürzel-Mennigvogel **Spanish**: Minivet de Swinhoe
Other common names: Brown-rumped/Canton Minivet

Taxonomy. *Pericrocotus cantonensis* Swinhoe, 1861, Guangzhou (Canton), China.
Forms a superspecies with *P. roseus* and *P. divaricatus*. Often considered conspecific with former, primarily because the two apparently interbreed in S China (S Guangdong), where a small, possibly now stable, population with mixed characters occurs in Xijiang Valley (this population initially described as a separate species, *P. stanfordi*, and subsequently often regarded as a race of *P. roseus*); on other hand, no sign of hybridization where ranges closely approach each other or overlap elsewhere in S China, and zone of occurrence of "*stanfordi*" is sufficiently restricted to suggest that the parent forms now behave as separate species; further study required. Monotypic.
Distribution. Breeds C, S & SE China from SE Gansu and S Shaanxi E to S Jiangsu, S to S Guizhou, Guangxi, Guangdong and Fujian; non-breeding S China (Yunnan), S Myanmar (Tenasserim), Thailand (S to Trang, including Phuket I), Laos, Cambodia and S Vietnam.



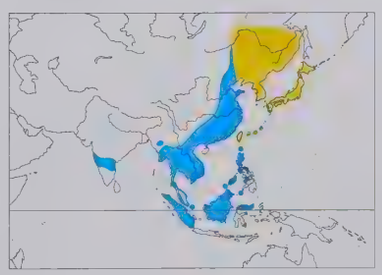
Descriptive notes. 18–19 cm. Male has black lores, charcoal-grey region from mid-crown and rear of eye across ear-coverts to hindcrown and nape; forecrown and rest of head side white, including narrow projection at side of neck; mantle to back, and lesser and median upperwing-coverts, grey; rump and uppertail-coverts clay-buff; greater coverts, primary coverts and remiges blackish, white (usually tinged yellowish-buff) spot on inner webs of primaries P7–P1 and extending on to both webs of secondaries (visible in flight, usually not on folded wing); rectrices dark brown, outer five feathers with increasing amounts of white from tip inwards; white below, tinged vinous and washed ashy grey on breast and flanks; underwing-coverts greyish-white; hybrid ("*stanfordi*") has pale pink forecrown, often pinkish on outer rectrices and wing markings, reddish tinge on rump, pink tinge on underparts; iris dark brown; bill and legs black. Distinguished from similar *P. divaricatus* by grey (not black) on rear of head, white of forehead more extensive (to behind eye), brown-tinged upperparts with brownish rump, usually less visible wing patch, vinous-brown wash below. Female differs from male in having dark grey of head and nape replaced with paler grey, upper forehead and forecrown also grey, wing flash larger, including narrow white edges of tertials and inner secondaries, and spot extending to outer webs of P1–P5 (yellowish patch on closed wing), entirely off-white underparts; hybrid ("*stanfordi*") has yellow wing markings, yellow in tail, yellow tinge on uppertail-coverts. Juvenile undescribed; immature like female, but top of head more uniform grey, rump and uppertail-coverts tipped grey-white and barred darker, tertials and inner secondaries broadly tipped and edged white, outer secondaries edged white, throat side, half-collar, breast and flanks faintly barred grey. Voice. Inadequately described; metallic trill, flight call similar to that of *P. divaricatus*.
Habitat. Broadleaf evergreen forest, pine (*Pinus*) forest, deciduous forest, forest edge, open woodland; to 1200 m.
Food and Feeding. Details of diet not documented; probably similar to *P. roseus*. Forages in canopy; often in cohesive parties in winter.
Breeding. No information.
Movements. Migratory; spends winter months S & W of breeding range. Recorded on passage in S & SE China, and Cambodia. Present in peninsular Thailand mid–Dec to late Mar. Several sight records from NE Bangladesh require confirmation.
Status and Conservation. Not globally threatened. Formerly considered Near-threatened. Not well known; apparently locally common in S China. Uncommon in non-breeding range in SE Asia; locally uncommon to sparse in S Thailand, where regarded as bordering on "Near-threatened" because of loss of possible forest habitat.
Bibliography. Carey *et al.* (2001), Cheng Tsohsin (1987, 2002), Collar *et al.* (1994), Deignan (1945), Delacour (1951a), Dickinson & Dekker (2002a), Duckworth (1996), Duckworth *et al.* (2002), Étchécopar & Hüe (1983), Kazmierczak (2000), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Medway & Wells (1976), Meyer de Schauensee (1984), Nguyen Cu *et al.* (2000), Rasmussen & Anderton (2005), Robson (2000), Round (2000a), Smythies (1986), Wells (2005), Zheng Guangmei & Zhang Cizu (2002).

73. **Ashy Minivet**

Pericrocotus divaricatus

French: Minivet cendré **German**: Graumennigvogel **Spanish**: Minivet Ceniciento
Other common names: Ryukyu Minivet (*tegimae*)

Taxonomy. *Lanius divaricatus* Raffles, 1822, Singapore.
Forms a superspecies with *P. roseus* and *P. cantonensis*. Closely related to former, and sometimes considered conspecific, but very distinct morphologically and differs also in moult and migration strategies. Dark race *tegimae* sometimes regarded as a separate species, but greater colour saturation is common among Ryukyu forms of Japanese bird species. Two subspecies recognized.
Subspecies and Distribution.
P. d. divaricatus (Raffles, 1822) – breeds SE Siberia (S from C Amurland), NE China (mainly Nei Mongol, Heilongjiang and Jilin), Korea and Japan, possibly also Taiwan; non-breeding mainly SE Asia, Greater Sundas and Philippines, also regularly India.
P. d. tegimae Stejneger, 1887 – Tokara Is and Ryukyu Is; recent breeding recorded also S Japan (S Kyushu).



Descriptive notes. 18 cm; average 21·6 g. Male nominate race has white forecrown, narrow black forehead band, black from lores to behind eye, across ear-coverts and extending over rear crown and nape; rest of head side and narrow half-collar at neck side white; upperparts, including lesser and median upperwing-coverts, uniform steel-grey; greater coverts and remiges sooty black, greater coverts tipped and edged steel-grey, outer webs of tertials and inner secondaries steel-grey, white spot on inner webs of P8–P1, on outer webs of P5–P1 and on both webs of secondaries (forming visible patch on closed wing); central pair of rectrices black, oth-

On following pages: 74. Small Minivet (*Pericrocotus cinnamomeus*); 75. Fiery Minivet (*Pericrocotus igneus*); 76. Flores Minivet (*Pericrocotus lansbergei*); 77. White-bellied Minivet (*Pericrocotus erythropygius*).

ers black with broad white tips; chin, throat and underparts white, underwing-coverts mottled grey and white; iris brown; bill and legs black. Differs from *P. cantonensis* in having rear head black, white forehead patch not extending behind eye, entire upperparts pure grey, visible wing patch, entirely white underparts. Female is like male, but black on head replaced by grey (except on lores and forehead), underparts duller white. Juvenile has more sooty upperparts with white feather fringes; immature like female, but greater coverts tipped white, tertials and inner secondaries boldly tipped and edged white, breast side and flanks finely and obscurely barred pale grey. Race *tegimae* is smaller than nominate, male much darker on upperparts, with much narrower white band on forecrown, upper breast ashy grey. Voice. Has metallic, jingling trill; flight call a rather unmelodious ascending "tchu-de tchu-dee-dee tchu-dee-dee".

Habitat. Evergreen and deciduous forests, secondary growth, woodland and areas with scattered trees; also mangroves, mixed peatswamp-forest, beach vegetation, casuarinas (*Casuarina*), plantations, open country, and even in towns, especially on passage and in winter. May occur in virtually any tree/open-area ecotone having scattered suitable cover. Sea-level to 1300 m; to 1600 m in Japan.

Food and Feeding. Eats mainly small invertebrates, including caterpillars (Lepidoptera) and, especially, flying insects, but no documented details. Forages in treetops, usually at outer edge of canopy; gleans larvae from leaves and branches, and catches adult insects in flight. Often occurs in flocks, especially in winter quarters; commonly joins mixed-species flocks in winter.

Breeding. Breeds May–Jun in Siberia; May–Jul in Japan, but in Ryukyus (race *tegimae*) nest-building from early Mar. Nest built by female, accompanied by and sometimes assisted by male, a cup of grass stems, cedar needles and lichens, often bound with cobwebs, placed 7–8 m above ground, in Ryukyus (race *tegimae*) occasionally to 11·5 m, in fork of horizontal tree branch. Eggs 4–5, rarely up to 7; incubation 17–18 days; no information on nestling period.

Movements. Race *tegimae* resident, with some local wandering. Nominate race a long-distance migrant, present on breeding grounds May–Sept in Siberia and Apr–Sept in Japan; migrates through Manchuria and Korea, Japan, Ryukyus, E China, Taiwan, recorded on passage also N Vietnam (E Tonkin) and Cambodia. Commonly migrates during day, also at night; passage recorded Hong Kong Mar–Apr and Sept–Oct. Main non-breeding grounds in SE Asia (mostly S parts), Greater Sundas and Philippines; occurs in Peninsular Malaysia and Philippines Sept–Apr, and recorded in Sumatra mid–Oct to late Jan. Regular but scarce non-breeding visitor to India, especially C peninsula, W Khandesh and Bombay; vagrant to C & SE Bangladesh, Andaman Is; one Sept record from N Sulawesi.

Status and Conservation. Not globally threatened. Race *tegimae*, often treated as a full species, is a restricted-range taxon: present in Nansei Shoto EBA. Fairly common in much of Ryukyu Is. Nominate race fairly common in China; fairly common but local in Japan; no information on status in SE Siberia, but formerly common there. In non-breeding season, uncommon to locally common in SE Asia and uncommon and sporadic in Philippines; few records Sumatra; occurs in several protected areas, e.g. Kaeng Krachan National Park, in Thailand, and Nam Bai Cat Tien National Park, in Vietnam.

Bibliography. Ali & Ripley (1996), Brazil (1991), Cheng Tsohsin (1987), Coates & Bishop (1997), Danielsen *et al.* (1994), Dementiev *et al.* (1969), Dickinson *et al.* (1991), Étchécopar & Hüe (1983), Flint *et al.* (1984), Grimmett *et al.* (1998), Herklots (1967), Inskipp *et al.* (1996), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Medway & Wells (1976), Morioka (2000), Navarro (1965), Pittie & Poddar (1998), Prys-Jones (1991), Rabor (1977), Rasmussen & Anderton (2005), Ripley (1982), Robertson (1991), Santharam (1988), Smythies (1999), Stresemann & Stresemann (1972, 1973), Temme (1973), Tsai Hangyeh (1985), Vaurie (1959), Wells (2005), White & Bruce (1986), Zheng Guangmei & Zhang Cizu (2002).

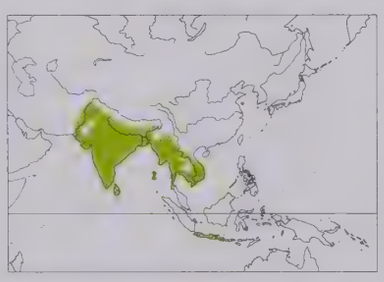
74. Small Minivet

Pericrocotus cinnamomeus

French: Minivet oranor **German**: Zwergmennigvogel **Spanish**: Minivet Chico
Other common names: Little/Lesser Minivet

Taxonomy. [*Motacilla*] *cinnamomea* Linnaeus, 1766, Sri Lanka.
Forms a superspecies, and sometimes considered conspecific, with *P. igneus* and *P. lansbergei*. Relationship with former not fully resolved; no evidence of interbreeding (except for a single, purportedly intermediate specimen) where their ranges meet, in peninsular Thailand, and different habitat preferences may prevent direct contact between them. Isolated race *saturatus* possibly represents a different species, primarily on grounds of zoogeography. Race *peregrinus* intergrades with *pallidus* and *vividus* in N Indian Subcontinent. Race *separatus* possibly better treated as synonym of *vividus*, as its supposedly large bill may be individually variable, rather than diagnostic. It has been suggested that birds from Andaman Is may merit treatment as a separate race, for which the name *osmastoni* was recently proposed, but further study required. Nine subspecies currently recognized.

Subspecies and Distribution.
P. c. pallidus Stuart Baker, 1920 – Pakistan (Indus Valley) and NW India.
P. c. peregrinus (Linnaeus, 1766) – NW Himalayas and N India (Punjab S to N Madhya Pradesh, E to Bihar and N Orissa).
P. c. cinnamomeus (Linnaeus, 1766) – C & SE India (S from S Rajasthan, Madhya Pradesh and S Orissa) and Sri Lanka.
P. c. malabaricus (J. F. Gmelin, 1789) – SW India (Karnataka, S from Belgaum, S to Kerala).
P. c. vividus Stuart Baker, 1920 – C Himalayas, E India (West Bengal, Assam), Bangladesh, W & C Myanmar, SW & C Thailand, and Andaman Is.
P. c. thai Deignan, 1947 – NE Myanmar, N & NE Thailand, Laos.
P. c. sacerdos Riley, 1940 – Cambodia and S Vietnam.
P. c. separatus Deignan, 1947 – SE Myanmar and NW peninsular Thailand.
P. c. saturatus Stuart Baker, 1920 – Java and Bali.



Descriptive notes. 16 cm; 6–12 g. Male nominate race is dark grey on lores, face to above eye, ear-coverts and chin to lower throat; forehead to back and scapulars paler grey, rump and uppertail-coverts rich reddish-orange; upperwing sooty black, greater coverts tipped orange, remiges with yellow flash on primaries, pale orange on secondaries; innermost two rectrices sooty black, outer four mainly pale orange; breast bright orange, shading to yellow on belly and creamy yellow on undertail-coverts; underwing-coverts pale yellow; iris dark brown; bill and legs black. Distinguished from congeners by combination of smaller size, grey head and upperparts (with darker face), and orange and yellow underparts. Female differs from male in having whitish forehead, narrow pale supercilium from base of bill to eye, white eyelids, paler grey crown to back and scapulars, duller orange rump (tinged olive), wing markings all yellow, much reduced on greater coverts, throat whitish, underparts greyish-white with yellow suffusion. Juvenile is like female, but cap to back, and lesser and median upperwing-coverts, browner, with whitish feather edges (broadest on coverts), tertials edged and tipped whitish; immature like female, but young male lacks supercilium. Races vary mainly in depth of coloration and extent of bright colours: *pallidus* is much paler above, has red below restricted to narrow band below throat, upper flanks washed yellowish, rest of underparts white, female also very pale, throat and underparts entirely white or whitish; *peregrinus* is intermediate between previous and nominate, rather dark grey above, throat blackish, mostly orange below, vent white, female strongly washed yellow below; *vividus* is darker above than last, throat blackish-grey, breast and flanks bright reddish-orange, belly and vent yellow; *malabaricus* is darker and more richly coloured than nominate, dark slaty grey above, with glossy black throat, deep reddish-orange below, orange-yellow on belly, female dark grey-brown above and extensively yellow on lower underparts; *thai* resembles previous, but male throat dark grey, not black; *sacerdos* has orange areas redder and more vivid; *separatus* female has less yellow on underparts that previous two; *saturatus* is darkest race. Voice. Contact call a thin, drawn-out whistle, "tswee-eet" and "swee swee", frequently repeated.

Habitat. Forest, woodland, mangrove forest, thorn-forest, strand woodland, casuarinas (*Casuarina*), scrub, orchards and other cultivated lands; sometimes occurs around villages. Prefers more open wooded habitats than those occupied by most congeners. Lowlands, to 1600 m.

Food and Feeding. Takes moths and caterpillars (Lepidoptera) and other insects, including beetles (Coleoptera) and cicadas (Cicadidae). Forages in parties in canopy; often joins mixed-species parties. Gleans leaves, and makes short sallies to catch flying prey.

Breeding. Feb–Nov, mainly Apr–Sept; may be double-brooded in some areas. Nest built by both sexes, a small, neat cup of fine twigs, grass stems, lichen, dead leaves or bark, lined with rootlets and bound with cobwebs, attached to tree branch or fork up to 12 m above ground. Eggs 2–4; incubation by female; no information on incubation and fledging periods.

Movements. None known.

Status and Conservation. Not globally threatened. Very common in suitable habitat over Indian Subcontinent; widespread and locally common in Bangladesh, but local in Pakistan and rare in Bhutan. Common in most of SE Asia, but regarded as "Vulnerable" in peninsular Thailand because of lack of records inland of mangrove zone. Uncommon in Java and Bali. A 19th-century specimen from Borneo is considered questionable. Occurs in several protected areas, including e.g. Royal Chitwan National Park, in Nepal, and Nagarhole and Keoladeo Ghana (Bharatpur) National Parks, in India.

Bibliography. Abdulali (1975), Ali (1969), Ali & Ripley (1996), Andrew (1985), van Balen (1999), Deignan (1945, 1947, 1963), Dickinson & Dekker (2002a), Futehally (1984), Grimmett *et al.* (1998), Hellebrekers & Hoogerwerf (1967), Inskipp & Inskipp (1991), Jerdon (1862), Jones *et al.* (1998), King *et al.* (1975), Kotagama (1985a, 1985b), Lekagul & Round (1991), MacKinnon & Phillipps (1993), Mittal & Vijay (1990), Mukherjee (1995), Neelakantan (1950), Ranasingh (1977), Rane (1984), Rasmussen & Anderton (2005), Ripley (1982), Roberts (1992), Robson (2000), Round (1988), Seneviratne (1976), Smythies (1986), Stuart Baker (1929), Van Tyne & Koelz (1936), Wells (2005).

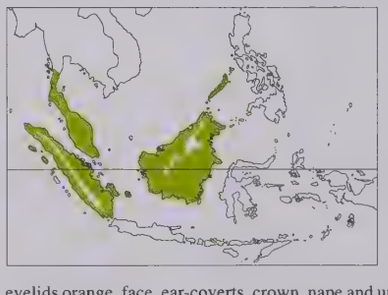
75. Fiery Minivet

Pericrocotus igneus

French: Minivet flamboyant **German**: Feuermennigvogel **Spanish**: Minivet Encendido

Taxonomy. *P[ericrocotus] igneus* Blyth, 1846, Melaka, Peninsular Malaysia.
Forms a superspecies with *P. cinnamomeus* and *P. lansbergei*. Sometimes treated as a race of *P. cinnamomeus*, and relationship between the two not fully resolved; no evidence of interbreeding (except for a single, purportedly intermediate specimen) where their ranges meet, in peninsular Thailand, and different habitat preferences may prevent direct contact between them. Two subspecies recognized.

Subspecies and Distribution.
P. i. igneus Blyth, 1846 – S Myanmar (Tenasserim), S Thailand, Peninsular Malaysia, Sumatra (including Nias I, Bangka and Belitung), Borneo and SW Philippines (Palawan).
P. i. trophis Oberholser, 1912 – Simeulue I, off W Sumatra.



Descriptive notes. 15–16·5 cm; 14–16 g. Nominate male has head, mantle and scapulars glossy black, back to uppertail-coverts rich orange-red; wings glossy black, outer webs of secondary coverts broadly edged orange-red, wingpanel formed by orange-red on outer webs of P6–P1 and yellow on inner webs of P9–P1; central two rectrices black, others orange-red; underparts rich orange-red, underwing-coverts yellow; iris dark brown; bill and legs black. Distinguished from very similar *P. flammeus*, *P. ethologus* and *P. brevirostris* by smaller size, more orange (less red) coloration, and smaller wing patch. Female has forehead, lores and eyelids orange, face, ear-coverts, crown, nape and upperparts to back lead-grey, rump and uppertail-coverts as in male, with narrow olive band between back and rump, upperwing grey, wingpanel paler orange and less extensive than on male, underparts yellow; differs from e.g. *P. flammeus* in combination of yellow underparts, orange-red rump and outer tail and orange-yellow wingpanel. Juvenile has head, upperparts and upperwings sooty brown with fine yellowish feather fringes, uppertail-coverts orange, primary coverts and remiges sooty black, tertials tipped yellow, wingpanel yellow to pale orange, throat and underparts off-white, faintly barred ash-brown; immature similar to adult female. Race *trophis* differs from nominate essentially in larger size. Voice. Rising "swee-eet" call.

Habitat. Forest and forest edges, in mature and well-regenerated vegetation; also in woodland, old plantations, very locally in casuarina (*Casuarina*) scrub, dry beach forest, occasionally wooded gardens close to forest. Normally in lowlands, to 1200 m.

Food and Feeding. Eats small arthropods, including ants (Formicidae) and small beetles (Coleoptera). Forages in canopy, gleaning from foliage; visits fig trees (*Ficus*), apparently to feed on insects attracted to ripening fruit. Often occurs in groups.

Breeding. Breeds in Apr-May (start of rains), and dependent fledglings recorded also Jun–Jul, in Malay Peninsula; in Dec (dry season) in Philippines (Palawan). Nest a shallow, neat small cup of fine twigs and other fibres, bound with cobwebs, decorated with lichen and bark, placed on fork of tree branch. Eggs 2. No other details.

Movements. None recorded.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Regular and more or less common in S Myanmar and Peninsular Malaysia, but uncommon in Thailand; extinct in Singapore. Current status in Borneo uncertain; was formerly uncommon. Locally quite common in Sumatra and on Palawan in 1980s and 1990s. Forest destruction in Sundaic lowlands of Indonesia is very extensive and continuing, and expected that all primary forms will have disappeared by 2010; situation in Thailand and Peninsular Malaysia similar. This species, however, can utilize submontane slopes, where forest destruction has been less severe, and it also inhabits secondary growth; it may, therefore, not be immediately threatened. Its stability after isolation on major slopes is not assured, but in production forest it has the advantage of being a high-canopy, gap-crossing species. Occurs in several protected areas, including Taman Negara National Park, in Peninsular Malaysia, Way Kambas National Park, in Sumatra, Danum Valley Conservation Area, in Borneo, and St Paul Subterranean River National Park, in Philippines.

Bibliography. Collar *et al.* (2001), Dickinson & Dekker (2002a), Dickinson *et al.* (1991), Duckworth & Kelsh (1998), Hawa (1985), Inskipp *et al.* (1996), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), McClure (1967), Medway & Wells (1976), Oberholser (1912), Rabor (1977), Robson (2000), Round (1988), Smythies (1986, 1999), Stattersfield & Capper (2000), Verheugt *et al.* (1993), Wells (2005).

76. Flores Minivet

Pericrocotus lansbergei

French: Minivet de Sumbawa **German**: Floresmennigvogel **Spanish**: Minivet de Flores
Other common names: Little/Orange-breasted/Sumbawa Minivet

Taxonomy. *Pericrocotus Lansbergei* Büttikofer, 1886, Bima, Sumbawa Island, Lesser Sundas.
Forms a superspecies with *P. cinnamomeus* and *P. igneus*; sometimes regarded as conspecific with former. Monotypic.
Distribution. Sumbawa and Flores, in W Lesser Sundas.



Descriptive notes. 16 cm. Male has glossy black head, mantle, scapulars and upper breast, orange-red rump and uppertail-coverts; upperwing blackish, orange-red panel on median and greater wing-coverts and broadly on bases of remiges; central pair of tail feathers black, remainder orange-red; breast and upper flanks orange-red, rest of underparts plain white; iris dark brown; bill and legs black. Distinguished from *P. cinnamomeus* by darker head and back, no yellow in wing, white abdomen; from *P. flammeus* by smaller size, white abdomen. Female differs from male in having black areas above replaced by smoky-brown, dull yellowish rump, smaller wing patch, entirely greyish-white to white throat and underparts. Juvenile undescribed; immature resembles female. Voice. Has quiet trilling calls.
Habitat. Open, parkland-type forest with sparse understorey; also primary forest, tall secondary and riverine forest, and woodland. Sea-level to 1150 m on Sumbawa and to 1820 m on Flores; mainly below 500 m.
Food and Feeding. Eats small arthropods. Usually forages in pairs or small groups; often joins mixed-species flocks. Forages by gleaning and hover-gleaning from horizontal perches in middle storey.
Breeding. Breeds Apr–Jun. No other information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Northern Nusa Tenggara EBA. Considered to be generally uncommon, but can be locally moderately common.

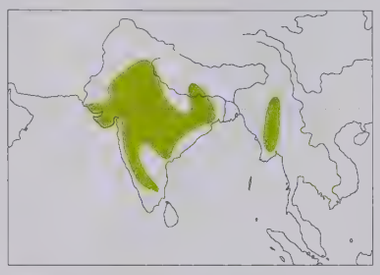
Bibliography. Andrew (1992), Butchart *et al.* (1996), Coates & Bishop (1997), Collar & Andrew (1988), Dickinson *et al.* (2002a), Inskipp *et al.* (1996), Johnstone *et al.* (1996), Strange (2001), Sujatnika *et al.* (1995), Trainor (2002a), White & Bruce (1986).

77. White-bellied Minivet

Pericrocotus erythropygius

French: Minivet à ventre blanc **Spanish**: Minivet Ventriblanco
German: Weißbauch-Mennigvogel
Other common names: Jerdon's Minivet

Taxonomy. *M[uscicapa] erythropygia* Jerdon, 1840, Ajanta Hills, Aurangabad District, Hyderabad, India.
Has been proposed that distinctive race *albifrons* be elevated to species rank. Two subspecies recognized.
Subspecies and Distribution.
P. e. erythropygius (Jerdon, 1840) – W & C India (mainly Gujarat and from C Rajasthan and W Haryana E to Bihar and S to C Maharashtra and Andhra Pradesh).
P. e. albifrons Jerdon, 1862 – plains of C Myanmar.



Descriptive notes. 15–16·5 cm. Distinctive minivet, with plumage somewhat reminiscent of that of a stonechat (*Saxicola*). Male nominate race has glossy blue-black head, mantle, back and scapulars, white rump with deep orange centre, black uppertail-coverts; upperwing black, greater upperwing-coverts pure white, primaries narrowly edged white-brown, tertials broadly edged white; tail black, outer four feather pairs tipped white, white becoming broader outwards, outermost rectrix mostly white; underparts (including underwing-coverts) white, with orange breast patch; iris dark brown; bill and legs black. Easily distinguished from all congeners by black-and-white plumage with orange on rump and breast. Female has black areas of male replaced by grey-brown, pale forehead and supraloral line, grey-brown ear-coverts, white throat and underparts, tinged ashy on breast; tail as male. Juvenile is like female, but crown, mantle and back scaled or barred whitish, upperwing-coverts tipped white, some dark spots on side of breast; immature like female, but not fully described. Race *albifrons* differs from nominate in having white forehead and supercilium, white throat, cheeks and neck side, more white in wing (edges of primary coverts white, tertials almost all white), white tips on all rectrices, eye brownish. Voice. Sweet, high-pitched notes, "thi", "tuee", "chi", "tschi", "tchu-it" and similar; contact call a soft "tchip".
Habitat. Open, dry scrub, grassland, savanna, dry cultivation with scrub and scattered trees, hedgerows and thorn-scrub; occurs in drier areas, on rocky scrub-covered slopes, sometimes in semi-desert.
Food and Feeding. Food mainly insects, including grasshoppers (Orthoptera), also spiders (Araneae). Occurs in pairs or small parties. Less arboreal than its congeners; perches on low bushes, long grass and even on the ground. Flies down to catch prey; hovers over grass and drops on to prey; gleans from leaves and weed stems; also catches insects in the air.
Breeding. Breeds in Jun–Oct in India and Jul in Myanmar. Nest built by both sexes, a small, neat cup of grass and fibres, lined with flowering grasses, bound with cobwebs and ornamented with bark or vegetable down on outside, placed 1–2 m above ground in vertical or horizontal fork of branch of bush or small tree. Eggs 3; both sexes incubate and care for young; no information on incubation and fledging periods.
Movements. Apparently makes erratic movements outside breeding season in India, where scattered records E to West Bengal and S to Kerala; also recorded as very scarce vagrant in S Pakistan.
Status and Conservation. Not globally threatened. Very local and uncommon to rare in India; occurs in Mudumalai National Park. Uncommon to rare in Myanmar, where formerly regarded as common.

Bibliography. Ali & Ripley (1996), Chakravarthy & Purna Chandra Tejasvi (1992), Collar & Andrew (1988), Daniels (1997), Grimmett & Inskipp (2003), Grimmett *et al.* (1998), Inskipp *et al.* (1996), Jerdon (1862), Karthikeyan (1992), Kazmierczak (2000), Mukherjee (1995), Rasmussen & Anderton (2005), Ripley (1982), Roberts (1992), Robson (2000), Saha & Dasgupta (1992), Smythies (1986).



PLATE 12

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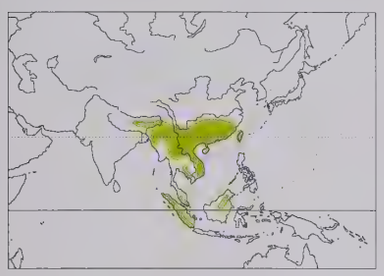
cm 8

78. Grey-chinned Minivet

Pericrocotus solaris

French: Minivet mandarin **German**: Graukehl-Mennigvogel **Spanish**: Minivet Gorgigrís
Other common names: Mountain/Yellow-throated Minivet; Grey-throated Minivet (*cinereigula*)

Taxonomy. *P[ericrocotus] solaris* Blyth, 1846, Darjeeling, West Bengal, India.
Distinctive race *montanus* sometimes treated as a separate species, a possibility that deserves further study. Eight subspecies recognized.
Subspecies and Distribution.
P. s. solaris Blyth, 1846 – C & E Himalayas (WC Nepal E to Assam) and N & W Myanmar.
P. s. rubrolimbatus Salvadori, 1887 – E & SE Myanmar and N Thailand.
P. s. montpellieri La Touche, 1922 – S China (N Yunnan).
P. s. griseogularis Gould, 1863 – SE China (Guizhou, N Guangxi, C & S Hunan, Guangdong, NW & E Fujian), Taiwan, Hainan, NE Laos and N Vietnam.
P. s. deignani Riley, 1940 – S Laos and C Vietnam (C & S Annam).
P. s. nassovicus Deignan, 1938 – SE Thailand and S Cambodia.
P. s. montanus Salvadori, 1879 – Peninsular Malaysia and W Sumatra.
P. s. cinereigula Sharpe, 1889 – N Borneo.



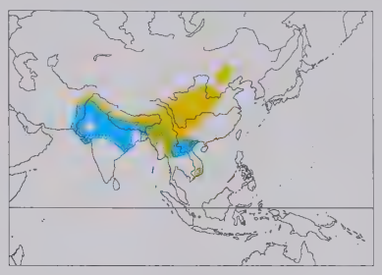
Descriptive notes. 17–19 cm; 11–17 g. Male nominate race has top of head and upperparts leaden black, ear-coverts and cheeks ashy grey; upperwing-coverts and remiges blackish, greater coverts tipped scarlet, merging into vermilion band across bases of primaries P1–P7; central pair of rectrices black, edged vermilion near tip, other rectrices vermilion with black bases; chin light grey, throat orange; underparts orange-scarlet, thighs grey-black, underwing-coverts orange; iris dark brown; bill and legs black. Distinguished from other red minivets mainly by grey chin and ear-coverts, and by bright colours being more orange than red. Female has black areas replaced by dark grey-brown, lower back, rump and uppertail-coverts greenish-yellow, red in wings replaced by yellow, primaries edged whitish towards tips, face side light grey, throat greyish-white, shading into yellow on breast, rest of underparts bright yellow. Juvenile is like female but darker above, with yellow scales or bars, inner secondaries and tertials edged yellow; immature like adult female, but back to uppertail-coverts barred or uniform yellow-olive. Race *montpellieri* male has dark olive mantle, olive-yellow rump, red uppertail-coverts; *rubrolimbatus* has whitish chin, orange-yellow wash on throat; *griseogularis* is tinged yellow-olive on throat and is redder on underparts than previous; *nassovicus* differs from last in having yellow-olive on throat darker, less contrasting, underparts more reddish-orange; *deignani* resembles previous, but crown and mantle slightly darker; *cinereigula* male has dark grey throat; *montanus* male is distinctive, has entire head glossy black, as well as mantle to scapulars, and is redder on wings and underparts. Voice. Thin, repeated "tswee-seet", a slurred "swirrrrirrit", and soft "trip" and "trii-ii" notes when foraging.
Habitat. Open forest, both broadleaf evergreen and moist deciduous forest, sometimes coniferous forest, and including short summit-growth; also forest edge, secondary growth (especially with large tree-ferns), sometimes wooded gardens. In mountains, mostly from 600 m to 3050 m; down to 300 m or lower in non-breeding season.
Food and Feeding. Takes small invertebrates, including termite alates (Isoptera). Groups often join mixed-species parties. Forages in canopy, mainly in terminal foliage. Gleans items; also makes aerial sallies after swarming termites.
Breeding. Breeds Feb–Apr in Malay Peninsula; Jun in Himalayas. Nest built by both sexes, a small cup of twigs, roots and grass stems (sometimes bryophytes), bound with cobwebs and camouflaged with lichens, placed 10–21 m above ground on exposed lateral bough or in horizontal fork of forest tree. Eggs 3; no information on incubation and fledging periods; young tended by both sexes.
Movements. Mainly resident; altitudinal movements in E Himalayas and elsewhere.
Status and Conservation. Not globally threatened. Scarce in Nepal; common in Bhutan; locally frequent in NE India. Common throughout range in China and Taiwan; common also in SE Asia, including Malay Peninsula (race *montanus*), where its habitat is still extensively secure, but few recent records of *montanus* from Sumatra. Current status in Borneo not known, but occurs in Mount Kinabalu National Park; formerly very common. Found in several other protected areas, e.g. Kaeng Krachan National Park, in Thailand.
Bibliography. Ali (1986), Ali & Ripley (1996), Ali *et al.* (1996), Cheng Tsohsin (1987), Deignan (1945, 1963), Dickinson & Dekker (2002a), Eames & Ericson (1996), Eames & Robson (1992), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Hawa (1985), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), Madoc (1976), van Marle & Voous (1988), Medway & Wells (1976), Rasmussen & Anderton (2005), Ripley (1982), Robson (2000), Round (1988), Smythies (1986, 1999), Stepanyan (1995), Tsai Hangyeh (1985), Wells (2005), Zheng Guangmei & Zhang Cizu (2002).

79. Long-tailed Minivet

Pericrocotus ethologus

French: Minivet rouge **German**: Langschwanz-Mennigvogel **Spanish**: Minivet Colilargo
Other common names: Flame-coloured Minivet

Taxonomy. *Pericrocotus brevirostris ethologus* Bangs and J. C. Phillips, 1914, Hsien Shan, Hubei, China.
Was for long erroneously included within partly sympatric *P. brevirostris*. Putative race *cryptus* (described from Doi Pha Hom Pok, in N Thailand) considered indistinguishable from *ripponi*. Seven subspecies recognized.
Subspecies and Distribution.
P. e. favillaceus Bangs & J. C. Phillips, 1914 – breeds NE Afghanistan (Nuristan) and NW Himalayas (E to W Nepal); non-breeding S to S Pakistan and W India.
P. e. laetus Mayr, 1940 – E Nepal E to NE India (N & W Assam) and S China (SE Xizang).
P. e. ethologus Bangs & J. C. Phillips, 1914 – breeds NE India (E Assam), N Myanmar and C China (Hebei and S Shanxi S to SW Gansu, SE Qinghai, Yunnan and Guizhou); non-breeding N Thailand, N Laos, N Vietnam (Tonkin).
P. e. mariae Ripley, 1952 – NE India (SE Assam) and W Myanmar (Chin Hills).
P. e. yvettae Bangs, 1921 – NE Myanmar and S China (W & SW Yunnan).
P. e. ripponi Stuart Baker, 1924 – E Myanmar (S Shan, Karenni) and NW Thailand.
P. e. annamensis Robinson & Kloss, 1923 – SC Vietnam (S Annam).



Descriptive notes. 17·5–20·5 cm; 18 g. Male nominate race has head and upperparts to upper back black, glossed blue, lower back to uppertail-coverts scarlet; upperwing glossy black, greater coverts largely all scarlet, secondaries and tertials black, innermost 2–3 secondaries/outer tertials margined scarlet, inner primaries (P1–P7) with scarlet band across bases, longer on outer feathers, outermost primary edged pink-white; tertials narrowly edged whitish when fresh; tail relatively long, central two pairs of rectrices black, R2 with narrow red edge, outer four largely scarlet; upper throat dull black, lower throat and breast to undertail-coverts scarlet; underwing-coverts orange-chrome; iris dark brown; bill, legs and feet black. Distinguished with difficulty from other red-and-black minivets mainly by slim build, relatively long tail, distinctive pattern of wing patch, with second red line (along secondary/tertial edges); from *P. flammeus* by lack of red spot near tip of inner secondaries and tertials. Female has narrow yellowish band on forehead and above dusky lores, narrow white eyering, whitish cheeks, pale grey ear-coverts; greyish-olive upperparts, greyer on crown, with lower back to uppertail-coverts yellowish olive-green; red in wings replaced by yellow, but no yellow edges of tertials; red in tail replaced by yellow, with less colour on R2; chin and upper throat whitish, lower throat pale yellow, underparts yellow with faint olive wash. Juvenile is like female, but upperparts scaled yellowish, upperwing-coverts tipped yellowish-white, chin to lower breast whitish, throat side, breast and flanks spotted and barred grey-brown; immature like female, but male darker on upperparts and more orange on areas that are yellow in female, lacks coloured secondary/tertial edges. Races differ mainly in plumage of female: *yvettae* has greyer crown to mantle than nominate, with yellower forehead; *annamensis* is similar to previous, but yellow in plumage deeper and brighter, with orange tinge; *mariae* differs from last in having less of an orange tinge in yellow areas, male has larger wing patch; *ripponi* is intermediate between previous and nominate; *favillaceus* has cold grey upperparts and paler, lemon-yellow, underparts; *laetus* has more extensive and brighter yellow on upperparts, and orange tinge in yellow underparts. Voice. A sweet, rolling repeated "prrr'wi" and "prrr'i"; thin, sibilant "swii-swii swii-swii-swii".
Habitat. Wide range of open forest types, including broadleaf and pine (*Pinus*) forests, light forest and forest edge; occurs also (especially in winter) in largely deforested areas, groves, wooded cultivation and roadside avenues. Mountains at 900–3650 m, rarely to 3965 m; descends to 245 m in non-breeding season.
Food and Feeding. Eats chiefly insects, including orthopterans, hymenopterans, beetles (Coleoptera), flies (Diptera) and insect larvae, also spiders (Araneae); also takes buds of acacias (*Acacia*) and fruits. Forages chiefly in canopy; gleans, makes aerial sallies, and hovers in front of flowers. May form large flocks outside breeding season.
Breeding. Season Apr–Jun. Nest built by both sexes, a neat cup of grass stems, fine twigs, rootlets or moss, with cobweb and lichen on outside, attached to horizontal tree branch 5–24 m (usually above 15 m) above ground. Eggs 3–4; no information on incubation and fledging periods; young fed by both parents.
Movements. Nominate race mainly migratory, moves S to N parts of SE Asia (mainly N Thailand, N Laos, Tonkin) after breeding. Partially migratory also in NW of range (race *favillaceus*), moving S to C Pakistan (rarely, S to Sind) and W India (to Rajasthan). Seasonal altitudinal movements, with post-breeding descent to lower levels, including plains areas, also dispersive in winter. Arrives in high-altitude breeding areas in Afghanistan and Himalayas in Mar–Apr; absent from these areas Oct–Mar, descent to lower altitudes generally occurring Aug–Nov, reaching foothills by Sept and plains by Nov. Nepal breeders winter as far S in India as Madhya Pradesh and Orissa.
Status and Conservation. Not globally threatened. Common in Pakistan, N India, Nepal, Bhutan, Myanmar, Thailand and Vietnam (Annam); common in China. Uncommon to locally common non-breeding visitor in Myanmar, Thailand and E Tonkin, but scarce and local in Bangladesh. Status in Laos and W Tonkin unclear. Occurs in a number of protected areas.
Bibliography. Ali (1986), Ali & Ripley (1996), Ali *et al.* (1996), Bangs & Phillips (1914), Cheng Tsohsin (1987), Deignan (1945, 1963), Dharmakumarsinhji (1985), Dickinson & Dekker (2002a), Eames & Ericson (1996), Eames & Robson (1992), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), King *et al.* (1975), Lekagul & Round (1991), Liu Huanjin & Shen Shouyi (1989), MacKinnon & Phillipps (2000), Martens & Eck (1995), Mukherjee (1995), Norman & Sivasubramanian (1992), Rasmussen & Anderton (2005), Ripley (1982), Roberts (1992), Robson (2000), Round (1988), Smythies (1986), Vaurie (1959), Zheng Guangmei & Zhang Cizu (2002).

80. Short-billed Minivet

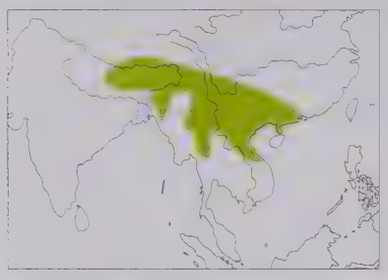
Pericrocotus brevirostris

French: Minivet à bec court **German**: Kurzschnabel-Mennigvogel **Spanish**: Minivet Piquicorto

Taxonomy. *Muscipeta brevirostris* Vigors, 1831, Himalayas = "probably Sikkim foothills".
Was for long erroneously considered to include partly sympatric *P. ethologus*. Race *affinis* sometimes synonymized with nominate, which possibly a preferable treatment, although some specimens identified as of former race are, in fact, referable to *P. ethologus*; further study required. Proposed race *pulcherrimus*, described from S Myanmar (Mulayit Taung, in Tenasserim), considered inseparable from *neglectus*, and *tonkinensis*, described from N Vietnam (Bac Kan, in Tonkin), indistinguishable from *anthoides*. Four subspecies recognized.
Subspecies and Distribution.
P. b. brevirostris (Vigors, 1831) – C & E Himalayas (in NE India extending S into W Assam) and S China (SE Xizang, NW Yunnan).
P. b. affinis (McClelland, 1840) – NE India (E Assam), N Myanmar and S China (Sichuan, W & SW Yunnan).

On following pages: 81. Sunda Minivet (*Pericrocotus miniatus*); 82. Scarlet Minivet (*Pericrocotus flammeus*).

P. b. neglectus Hume, 1877 – SE Myanmar and NW Thailand.
P. b. anthoides Stresemann, 1923 – S China (SE Yunnan, Guizhou, Guangxi, N Guangdong), Laos and N Vietnam.



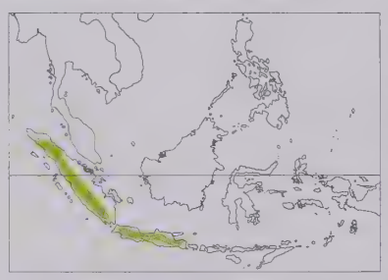
Descriptive notes. 19–20 cm; 16–17 g. Male nominate race has head to upper breast, and mantle and scapulars, glossy blue-black, back to uppertail-coverts deep crimson; upperwing-coverts glossy black, greater coverts crimson, remiges black, basal half of primaries P1–P7 crimson; central pair of rectrices black, next pair crimson with black on basal half, outer three pairs crimson; underparts crimson, thighs blackish, underwing-coverts yellow-orange; iris dark brown; bill and legs black. Differs from *P. ethologus* in shorter tail with more extensive red, lack of red line along edges of inner secondaries/tertials; from *P. flammeus* in lack of red spot near tip of inner secondaries and tertials. Female has yellowish forehead, this colour extending to crown, yellow-washed greyish ear-coverts and cheeks, yellowish eyering; upperparts dull ashy grey, lower back to uppertail-coverts yellowish olive-green, crimson in wing and tail replaced by yellow; chin, throat and entire underparts yellow. Juvenile is like female, but upperparts scaled yellowish, upperwing-coverts tipped yellowish-white, side of throat, breast and flanks spotted and barred grey-brown, underparts less extensively yellow, more whitish; immature like female, but young male more orange-yellow on underparts and orange on wings and tail. Races differ mainly in plumage of female: *affinis* female has less yellow on head, more like *P. ethologus*; *neglectus* is smaller than nominate; *anthoides* female has chin and underparts duller yellow. Voice. Call a distinctive, thin, sweet, repeated whistled "tsuuuit"; dry "tup" as contact note.
Habitat. Open deciduous and evergreen forest, forest edge and secondary growth; also pine (*Pinus*) forest. In mountains at 900–2745 m; breeds at 1800 m and above.
Food and Feeding. Takes adult and larval arthropods; also buds. Usually occurs in pairs; often joins mixed-species foraging flocks. Forages among foliage. No further information.
Breeding. Breeds Mar–Apr. Nest a neat cup of moss and lichen, placed c. 10 m above ground on horizontal outer branch of tree. Eggs 3. No other information.
Movements. Descends to lower levels in winter.
Status and Conservation. Not globally threatened. Fairly common to locally common in Myanmar, NW Thailand, Laos and N Vietnam; uncommon in China; scarce in Himalayas. Generally much less numerous than *P. ethologus* where both species occur together. Status and ecology poorly known, because of past confusion with latter species. Occurs in several protected areas, e.g. Namdapha National Park, in India, and Doi Inthanon National Park, in Thailand.
Bibliography. Ali (1986), Ali & Ripley (1996), Cheng Tsohsin (1987), Deignan (1945), Dickinson & Dekker (2002a), Dodsworth (1910), Duckworth *et al.* (2002), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Heath (1989), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Mayr (1940), Rae (1934), Rasmussen & Anderton (2005), Ripley (1982), Robson (2000), Round (1988), Smythies (1986), Zheng Guangmei & Zhang Cizu (2002).

81. **Sunda Minivet**

Pericrocotus miniatus

French: Minivet vermillon **German**: Sundamennigvogel **Spanish**: Minivet de la Sonda

Taxonomy. *Muscicapa miniata* Temminck, 1822, Java.
Monotypic.
Distribution. Highlands of W Sumatra and Java.



Descriptive notes. 19 cm. Very long-tailed minivet, unique in having female plumage black and red, as male. Male has head and upperparts black, slightly glossed blue; lower back, rump and uppertail-coverts scarlet-vermilion; wings black, greater upperwing-coverts vermilion, innermost with black centres, primaries with broad vermilion band across both webs (only on inner webs of P7–P10); central pair of rectrices black, slightly edged and tipped vermilion, remainder vermilion with black bases; throat black, underparts scarlet-vermilion, underwing-coverts paler vermilion, thighs blackish, spotted pink; iris brown; bill and legs black. Distinguished from congeners by combination of black head, very long tail, and absence of red spot on inner secondaries. Female is similar to male, except that forehead, supercilium, face side, throat and entire underparts are rose-vermilion, mantle and lesser upperwing-coverts have dull crimson feather edges, greater coverts black, broadly tipped vermilion. Juvenile and immature undescribed. Voice. Hard, shrill "chee-chee-chee" and a protracted, loud "tsree-ee".
Habitat. Forest and forest edge, including moss forest; also cultivated lands, and pine (*Pinus*) plantations in Sumatra. In mountains, from 1200 m to 2700 m.
Food and Feeding. Food not documented; presumably mainly insects. Frequents canopy, occurring in parties and flocks; no information on foraging methods.
Breeding. No information.
Movements. None recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA and Java and Bali Forests EBA. Poorly known. Regarded as quite common in Java and locally common in Sumatra in 1980s and early 1990s. Rare in Gunung Gede-Pangrango National Park, in Java.
Bibliography. Andrew (1985, 1992), Hellebrekers & Hoogerwerf (1967), Holmes & Nash (1989), Inskipp *et al.* (1996), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Nijman & Sözer (1996), Sujatnika *et al.* (1995).

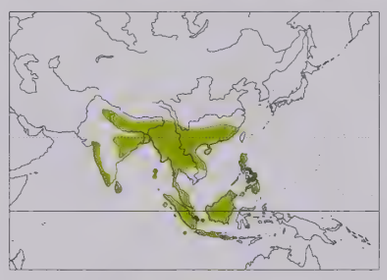
82. **Scarlet Minivet**

Pericrocotus flammeus

French: Grand Minivet **German**: Scharlachmennigvogel **Spanish**: Minivet Escarlata

Other common names: Indian/Flame/Orange Minivet

Taxonomy. *Muscicapa flammea* Forster, 1781, no locality = Sri Lanka.
Geographical variation complex and inadequately described, with many intermediate populations in SE Asia; modern review desirable. Race *speciosus* sometimes regarded as a separate species, on basis of its deep scarlet colour; if such treatment adopted, *fraterculus*, *andamanensis* and *semiruber* could perhaps be included as races of it. Race *nigroluteus* originally named *neglectus*, but latter name invalid, because preoccupied. Birds on Bohol (Philippines) of unconfirmed racial identity, presumed to belong with *leytensis*. Populations now placed in race *fraterculus* were previously listed as race *elegans*; however, type locality of *elegans* (Sadiya, in NE Assam) subsequently reckoned to fall within range of *speciosus*, making these two synonyms, and leaving *fraterculus* as the name for populations from S Assam to Hainan. Proposed race *suchitrae* (W & SW Myanmar E to C & S Indochina) considered indistinguishable from *semiruber*. Nineteen subspecies currently recognized.
Subspecies and Distribution.
P. f. speciosus (Latham, 1790) – Himalayas from Jammu and Kashmir E to S China (SE Xizang).
P. f. fraterculus Swinhoe, 1870 – NE India (hills of Assam S of R Brahmaputra), N Myanmar, S China (Yunnan, Hainan I) and N Indochina.
P. f. flammeus (J. R. Forster, 1781) – W & S India and Sri Lanka.
P. f. semiruber Whistler & Kinnear, 1933 – EC India, S Myanmar and Thailand (except C & S) E to C & S Indochina.
P. f. andamanensis Beavan, 1867 – Andaman Is.
P. f. fohkiensis Buturlin, 1910 – SE China (Guizhou E to Fujian, S to Guangxi and Guangdong).
P. f. flammifer Hume, 1875 – SE Myanmar, SW & S Thailand and N & E Peninsular Malaysia.
P. f. xanthogaster (Raffles, 1822) – W & S Peninsular Malaysia and Sumatra (including E coast islands).
P. f. minythomelas Oberholser, 1912 – Simeulue I, off NW Sumatra.
P. f. modiglianii Salvadori, 1892 – Enggano I, off SW Sumatra.
P. f. insulanus Deignan, 1946 – Borneo.
P. f. siebersi Rensch, 1928 – Java and Bali.
P. f. exul Wallace, 1864 – Lombok (E of Bali).
P. f. novus McGregor, 1904 – N & C Philippines (Luzon, Negros).
P. f. leytensis Steere, 1890 – EC Philippines (Samar, Leyte, Bohol).
P. f. gonzalesi Ripley & Rabor, 1961 – S Philippines (N & E Mindanao).
P. f. nigroluteus Parkes, 1981 – SC Mindanao.
P. f. johnstoniae Ogilvie-Grant, 1905 – Mt Apo, in SE Mindanao.
P. f. marchesae Guillemard, 1885 – Sulu Archipelago (Jolo).



Descriptive notes. 17–22 cm; 19–24·5 g. A robust minivet with heavy bill, relatively broad tail. Male nominate race has head, chin, throat and mantle to upper back glossy blue-black, lower back, rump and uppertail-coverts fiery orange-red; upperwing black, greater coverts broadly tipped orange-red, remiges with broad band of orange-red near base, three innermost secondaries/tertials with red spot or line near tip of outer webs; rectrices black, all except central pair with orange-red tip, red increasing in extent on outers; underparts bright orange-red, thighs blackish, underwing-coverts bright yellow; iris dark brown; bill and legs black. Distinguished from all congeners by isolated red markings near tips of tertials and inner secondaries. Female has forehead and broad supraloral line bright yellow, crown to back and upperwing-coverts ashy grey to olive-washed grey, lower back, rump and uppertail-coverts greenish-yellow, remiges and rectrices blackish, red areas of male replaced by yellow; entirely bright yellow below. Juvenile is like female, but has yellowish scaly markings from crown to mantle, greyish scaling on breast side and flanks, with upperwing-coverts and tertials broadly edged yellow, suggestion of adult pattern on tertials/inner secondaries; immature as adult female, but young male has yellow areas of latter more orange. Races vary mainly in size, shade of red on male underparts, shade of yellow on female underparts, extent of bright colour on central rectrices and wings: *speciosus* is largest, male deep scarlet, less orange than nominate, with more red in wing, often some scarlet on central rectrices, female with yellow areas somewhat deeper yellow; *semiruber* differs from previous in smaller size, male outer webs of central rectrices usually red; *fraterculus* is intermediate between previous two, male central rectrices with little or no red on outer webs (variable); *fohkiensis* female has lower back to tail-coverts bright olive-green (sometimes slight golden tinge), relatively pale and greenish-tinged lemon below; *xanthogaster* is small, male with red outer webs of central rectrices, larger tertial spots, female crown to upper back slate-coloured with faint blue gloss; *flammifer* resembles previous but slightly larger, tendency for more red in male wing, female with distinct golden suffusion on lower back to tail-coverts, more yellow in wing, rather orange-tinged underparts; *andamanensis* differs from nominate in having red areas bright scarlet (rather than orange), slightly more red in wing, female with yellow areas deeper in colour; *minythomelas* is very like last, but male has much scarlet on central rectrices (almost entire outer web, tip of inner web), female has crown to upper back glossy bluish-slate (not ashy grey); *modiglianii* is also very similar, but male usually with less red in central rectrices, female slightly paler and less glossed above and with yellow areas less bright; *insulanus* male is identical to *xanthogaster*, female differs from latter in having less yellow on forehead, darker crown to upper back, bright olive-green lower back to tail-coverts (no golden suffusion), paler underparts; *siebersi* is smaller than nominate, male less intensely orange, thighs mixed orange and grey, female with rump olive-green and on average less intensely yellow below; *exul* differs from previous in male having lower back to tail-coverts bright orange-chrome (not fiery scarlet), wing and tail markings less reddish, female perhaps on average slightly paler below; *leytensis* has red areas bright orange-red, including tips of central rectrices, dark grey thighs, female has bluish-slate crown to upper back, contrasting yellow forehead and short supercilium, blackish lores, deep golden-yellow lower back to tail-coverts, bright lemon-chrome below; *novus* is like previous, but male wing markings less intensely orange, thighs mixed orange and grey, underparts brighter orange, female crown to upper back slaty black; *johnstoniae* male has lower back to tail-coverts and wing markings bright yellow-orange, central rectrices narrowly tipped same colour, underparts bright cadmium-yellow, thighs slate, female crown to upper back bluish-slate, lower back to tail-coverts deep yellow; *gonzalesi* male differs from previous in having bright areas more richly orange-yellow; *marchesae* male has bright parts of plumage bright golden yellow (not orangey); *nigroluteus* is similar to last, perhaps slightly more orangey. Voice. Loud, piercing whistles, "sweep-sweep-sweep-sweep", "weep-weep-weep-wit-wip" and similar.

Habitat. Broadleaf evergreen, semi-evergreen and deciduous forests, and peatswamp-forest; occurs also in orchards. In disturbed forest requires good cover of tall trees, and avoids low regrowth. Hills and mountains to 2100 m; below 915 m in Peninsular Malaysia.
Food and Feeding. Eats mainly insects, including caterpillars (Lepidoptera), grasshoppers and green crickets (Orthoptera) and cicadas (Cicadidae); also spiders (Arachnida). Gregarious; regularly joins mixed-species foraging flocks. Forages in canopy or in crowns of emergent trees; visits crops of ripe figs (*Ficus*), apparently for insects attracted by the fruit. Prey taken mainly in canopy foliage; also sallies after flushed prey, and hovers in front of flowers.
Breeding. Breeds in Apr–Jun in Himalayas and Feb and Jun–Oct in peninsular India; Feb–May and (second brood) Aug–Sept in Sri Lanka; Jun-Jul in SE Asia, and Mar–Apr in Lombok and Philippines. Nest a small, neat open cup of lichens, bound with cobwebs and decorated with bark, placed 6–20 m above ground on horizontal fork or tree branch. Eggs 2–3; incubation performed by female only, young fed by both sexes; no information available on incubation and fledging periods.
Movements. Mostly resident. Some altitudinal movements; in Himalayan region, descends from breeding areas (up to 1800 m or higher) to lower elevations and plains in winter; race *fraterculus* reaches NE Thailand in non-breeding season.

Status and Conservation. Not globally threatened. Widespread and common in Nepal; locally common in India, Bangladesh and China; common in Bhutan and Sri Lanka; common in SE Asia (except C Thailand) and in Philippines; scarce in Singapore. Thought to be uncommon in Borneo (race *insulanus*). Status of Lombok race *exul* unclear; apparently no recent records. Occurs in many protected areas in much of its range, e.g. Royal Chitwan National Park, in Nepal, Mudumalai National Park, in India, Kaeng Krachan National Park, in Thailand, Nam Bai Cat Tien National Park, in Vietnam, Taman Negara National Park, in Peninsular Malaysia, Way Kambas National Park, in Sumatra, and Danum Valley Conservation Area, in Borneo.
Bibliography. Ali (1969, 1986), Ali & Ripley (1996), van Balen (1999), Cheng Tsohsin (1987), Coates & Bishop (1997), Danielsen *et al.* (1994), Deignan (1945, 1946), Dickinson & Dekker (2002a), Dickinson *et al.* (1991), Eames & Robson (1992), Étchécopar & Hüe (1983), Evans, Dutson & Brooks (1993), Gibson (1993b), Grimmett *et al.* (1998), Hawa (1985), Hellebrekers & Hoogerwerf (1967), Himmatsinhji (1982), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Jones *et al.* (1998), Kennedy *et al.* (2000), Kotagama (1985a, 1985b), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), McCann (1931), Medway & Wells (1976), Mees (1996), Parkes (1974, 1981), Rabor (1977), Rasmussen & Anderton (2005), Ripley (1982), Round (1988), Santharam (2003), Smythies (1986, 1999), Stuart Baker (1897), Wells (2005), White & Bruce (1986), Zheng Guangmei & Zhang Cizu (2002).



PLATE 13

inches 3

cm 8

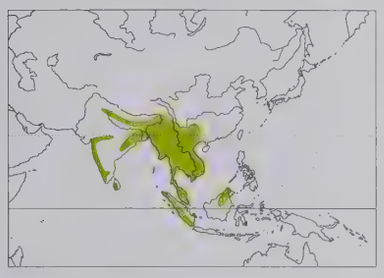
Genus *HEMIPUS* Hodgson, 1845

83. **Bar-winged Flycatcher-shrike**

Hemipus picatus

French: Échenilleur gobemouche **Spanish**: Oruguero Alibarrado
German: Elsterraupenschmätzer
Other common names: Pied Flycatcher-shrike, Pygmy Triller/Cuckoo-shrike

Taxonomy. *Muscicapa picata* Sykes, 1832, The Deccan, India.
Four subspecies recognized.
Subspecies and Distribution.
H. p. capitalis (Horsfield, 1840) – Himalayas (E from N India), S China (SE Xizang, W & S Yunnan, S & C Guizhou, W Guangxi), N, C & E Myanmar, NW Thailand, N Laos and N Vietnam (W Tonkin).
H. p. picatus (Sykes, 1832) – W, C & E India, Bangladesh, W & S Myanmar, W & E Thailand and C & S Indochina.
H. p. leggei Whistler, 1939 – Sri Lanka.
H. p. intermedius Salvadori, 1879 – S Thailand, Peninsular Malaysia, Sumatra and NE Borneo.



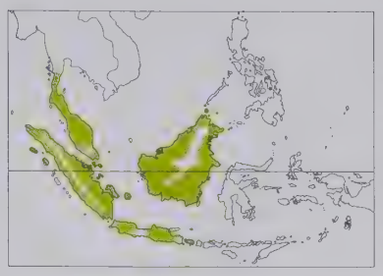
Descriptive notes. 14–15 cm; 8·5–9·5 g. Male nominate race has top of head, upperparts and wings glossy black, lores to ear-coverts also black, cheeks and side of neck white; rump white, upper rump barred black, uppertail-coverts black; median and greater upperwing-coverts broadly tipped white, three inner secondaries edged white (longitudinal bar on closed wing); tail black, tipped white (except central feathers), outermost feather also narrowly edged white; chin and stripe around throat side pure white; underparts greyish-white, more vinous on breast, whiter on belly, undertail-coverts and underwing-coverts; thighs ashy brown; iris red-brown; bill black; legs dark grey to black. Readily distinguished from *H. hirundinaceus* by white on wings and tip of tail. Female is like male, but glossy black areas replaced by sooty black. Juvenile resembles female, but white band on rump narrow, uppertail-coverts tipped white, rest of upperparts and lesser wing-coverts sooty brown with buff feather fringes, median and secondary coverts buff-white with two narrow brown bars, secondaries and tertials tipped and edged buff-white, underparts entirely off-white; immature apparently like female. Race *intermedius* is darker than nominate; *capitalis* has black cap and dark brown mantle; *leggei* is black above in both sexes, slightly paler below. Voice. Sharp "chisik" or "chir-rup" and shorter "tsik"; also high-pitched, trilling, repeated "wiraka".
Habitat. High, open canopy and edges of lowland forest, including disturbed forest; also secondary forest, bamboo stands, scrub, plantations and wooded gardens, including those far from true forest. In mountains, to 2100 m; breeds mainly at 600–1800 m in Himalayan region.
Food and Feeding. Takes insects, including butterflies (Lepidoptera), beetles (Coleoptera), winged ants (Formicidae) and winged termites (Isoptera). Regularly joins mixed-species flocks in canopy. Forages in manner of a flycatcher (Muscicapidae), perches upright and sallies from habitually used exposed perches; also gleans from foliage. Occasionally takes prey from ground.
Breeding. Breeds Feb–Aug in Indian Subcontinent, Apr in Myanmar, Feb and Apr in Peninsular Malaysia and Mar–Jul in China. Nest built by both sexes, a small, shallow cup of roots, fine twigs, moss and grasses, bound with cobwebs, anchored to branch 3–12 m above ground. Eggs 2–3; both sexes incubate and both care for young; no information on incubation and fledging periods.
Movements. Chiefly resident. Some altitudinal and local movements in Himalayas and NE India, with post-breeding descent to foothills and adjacent plains.
Status and Conservation. Not globally threatened. Fairly common in Indian Subcontinent, common in Nepal, Bhutan and Sri Lanka; common in SE Asia and China, but occurs rather sparingly in Myanmar. Common in N and in upland forest in Malay Peninsula, uncommon in S Malaysian lowlands; observed densities imply that major slope populations would be viable in isolation. Less numerous than *H. hirundinaceus* in Sumatra and Borneo. Occurs in several protected areas, e.g. Royal Chitwan National Park, in Nepal, Corbett National Park, in India, Kaeng Krachan National Park, in Thailand, and Taman Negara National Park, in Peninsular Malaysia.
Bibliography. Ali (1969), Ali & Ripley (1996), Ali *et al.* (1996), Deignan (1945, 1963), Duckworth *et al.* (2002), Eames & Ericson (1996), Eames & Robson (1992), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Hall (1956), Hawa (1985), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Jones *et al.* (1998), Kotagama (1985a, 1985b), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), McClure (1998), Medway & Wells (1976), Phillips (1940), Rasmussen & Anderton (2005), Ripley (1982), Robson (2000), Smythies (1986, 1999), Stepanyan (1995), Wells (2005).

84. **Black-winged Flycatcher-shrike**

Hemipus hirundinaceus

French: Échenilleur véloce **Spanish**: Oruguero Golondrina
German: Schwarzflügel-Raupenschmätzer
Other common names: Black-winged Pygmy triller

Taxonomy. *Muscicapa hirundinacea* Temminck, 1822, Java.
Monotypic.
Distribution. Extreme S Myanmar (S Tenasserim), extreme S Thailand, Peninsular Malaysia, Sumatra (including Nias I and Simeulue I), Riau and Lingga Archipelagos, Bangka, Belitung, Borneo (including Banggi I), Java and Bali.



Descriptive notes. 14–15 cm; 10–14 g. Male has top of head, upperparts and wings black, glossed green, lores to ear-coverts also black, cheeks and side of neck white; rump white, upper rump barred black, uppertail-coverts black; tail black, outermost feather narrowly edged white; throat and underparts white, greyer from lower throat and breast to anterior flanks; underwing-coverts mottled grey and white; iris dark brown; bill and legs black. Readily distinguished from *H. picatus* by lack of white on wings and tip of tail. Female is like male, but with black areas replaced by sooty brownish. Juvenile is like female, but with buff feather fringes on upperparts, upperwing-coverts broadly fringed buff (but primary coverts tipped pale buff), tertials and secondaries tipped buff, outermost tail feather edged and tipped whitish; immature as female, but primary coverts narrowly tipped off-white. Voice. Coarse "tu-tu-tu-tu-hee-tee-tee-teet" and "hee-too-weet", interspersed with high-pitched "cheet-weet-weet-weet" and similar.
Habitat. Canopy of forest, including freshwater swamp-forest, tall secondary growth and forest edge; also mangroves, mature plantations (including old rubber plantations) and wooded gardens. Occurrence in undisturbed primary forest in Sumatra uncertain. Lowlands to 1100 m, but to 1500 m in Java and Bali; generally scarce in Malay Peninsula above 300 m, above which altitude *H. picatus* becomes common.
Food and Feeding. Eats small insects. Commonly joins canopy-level mixed-species foraging parties. Snatches insects from underside of terminal foliage while hovering; also makes short flycatching flights, usually from an exposed perch.
Breeding. Breeds in Apr–Jun in Peninsular Malaysia, Jan–Apr and Aug–Nov in Sumatra, and Aug–Sept in Borneo. Nest built by both sexes, a cup or a truncated cone with cup-shaped depression, made of lichens, bark fragments, fibres, bryophytes and spider webs, placed 7–40 m above ground on horizontal tree branch. Eggs 2; chicks fed and brooded by both parents; no information on incubation and fledging periods.
Movements. None recorded.
Status and Conservation. Not globally threatened. Scarce to locally common; in 1990s regarded as local and uncommon in Thailand and fairly common in Sumatra, Borneo, Java and Bali. Considered "Near-threatened" in Peninsular Malaysia because of its lesser presence on major slopes and its generally narrower habitat range than that of *H. picatus*; important back-mangrove forest habitat has mostly been cleared in Peninsular Malaysia. Occurs in Taman Negara National Park, in Peninsular Malaysia, Way Kambas National Park, in Sumatra, Gunung Gede-Pangrango National Park, in Java and Bali, and Danum Valley Conservation Area, in Borneo.
Bibliography. Andrew (1985), van Balen (1999), Duckworth & Kelsh (1998), Ford & Davison (1995), Hawa (1985), Hellebrekers & Hoogerwerf (1967), Holmes (1994), Holmes & Nash (1989), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), McClure (1998), Medway & Wells (1976), Robson (2000), Round (1988, 2000a), Smythies (1986, 1999), Strange (2002), Verheugt *et al.* (1993), Vowles & Vowles (1997), Wells (2005).

Genus *TEPHRODORNIS* Swainson, 1832

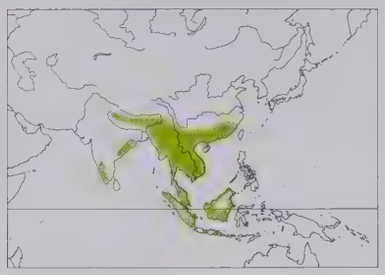
85. **Large Wood-shrike**

Tephrodornis virgatus

French: Téphrodorne bridé **German**: Großer Raupenwürger **Spanish**: Ceniciento Grande
Other common names: Brown-tailed/Hook-billed Wood-shrike/Greybird

Taxonomy. *Lanius virgatus* Temminck, 1824, Java.
Taxonomic position of genus uncertain; data derived from DNA–DNA hybridization indicate that it is closer to Prionopidae and should perhaps be placed in that family, but such treatment considered premature without further research and corroborative evidence. Species sometimes referred to by older specific name of *gularis*, but that name invalid, as preoccupied. Race *sylvicola* sometimes elevated to species rank on basis of differences in plumage and voice, and has been suggested that, for same reasons, *pelvicus* should also be treated as a separate species; review of whole complex required. Eleven subspecies recognized.
Subspecies and Distribution.
T. v. sylvicola Jerdon, 1839 – Western Ghats of India.
T. v. pelvicus (Hodgson, 1837) – E Himalayas from N India E to N, NE & SW Myanmar, also E India (Eastern Ghats).
T. v. jugans Deignan, 1948 – E Myanmar, S China (SW Yunnan) and NW Thailand (S to N Tak).
T. v. latouchei Kinnear, 1925 – S & SE China (W & SE Yunnan, Guizhov, Guangxi, N Guangdong, C & E Fujian).
T. v. hainanus Ogilvie-Grant, 1910 – N Laos, N Vietnam and Hainan I.
T. v. vernayi Kinnear, 1924 – SE Myanmar (S to N Tenasserim) and SW Thailand.
T. v. annectens Robinson & Kloss, 1918 – S Myanmar (S Tenasserim) and S Thailand.
T. v. mekongensis Meyer de Schauensee, 1946 – E & SE Thailand, S Laos, Cambodia and S Vietnam.
T. v. fretensis Robinson & Kloss, 1920 – SE peninsular Thailand, Peninsular Malaysia (S from Perlis and Narathiwat) and N Sumatra.
T. v. virgatus (Temminck, 1824) – S & SW Sumatra and Java.
T. v. frenatus Büttikofer, 1887 – Borneo.
Descriptive notes. 18·5–23 cm; 28–46 g. Thickset bird with heavy bill, distinct nasal tufts. Male nominate race has white forehead, blue-black mask from lores around eye to ear-coverts; otherwise, blue-grey above, with white lower rump; primary coverts and remiges blackish, edged blue-grey, secondaries and tertials mostly blue-grey; uppertail-coverts and tail black; cheeks, neck side, throat and underparts white, slightly washed greyish-pink on breast; axillaries and underwing-coverts blue-grey; iris yellow-brown to yellow; bill black; legs grey-black. Distinguished from *T. pondicerianus* by larger size, no white supercilium, more white on rump, no white in tail. Female is duller than male, with paler upperwing-coverts, hardly any white on forehead, paler and browner mask, outer rectrices edged and tipped white, eye sometimes pale blue, bill horn-brown. Juvenile has browner upperparts than female, with whitish shafts and feather tips from crown to mantle and scapulars, buffish and

On following page: 86. Common Wood-shrike (*Tephrodornis pondicerianus*).



whitish bars on upperwing-coverts and tertials, rectrices fringed dark buff; immature like female, but not fully described. Races differ mainly in size, and in colour of male upperparts and underparts: *sylvicola* has dark grey-brown upperparts, browner remiges; *pelvicus* has pale brown upperparts and tail, brownish breast, sometimes slight white stripe below mask; *annectens* has upperparts more greyish-washed, less contrasting; *vernayi* is intermediate between previous two, larger than latter, upperparts ashy brown (not ashy grey); *jugans* has grey crown and nape, grey-brown upperparts, no white on forehead; *fretensis* is smaller, pale dove-grey from crown to anterior mantle, then darker grey to back; *latouchei* has very brown mantle to rump, rufous edges of inner remiges and greater coverts; *hainanus* is dull, with grey crown and brown upperparts, female even browner; *frenatus* has less white on forehead, white on uppertail-coverts, browner wings and tail, vinaceous-grey underparts with contrasting white cheeks. Voice. Song a loud, ringing "pi-pi-pi-pi-pi-pi" or "ki-ki-ki-ki" and so on, or repeated "kee-a"; call a harsh, scolding, repeated "chreek". Song of race *sylvicola* a loud, ringing "ker-wíck-er-wíck" or "wíckywíckywícky-wíck-er-wíck"; calls of *sylvicola* and *pelvicus* include low-pitched "gwup" and harsh, reedy rasps.

Habitat. Broadleaf evergreen forest, mixed deciduous forest, forest edge, logged forest with some tall trees, secondary growth and woodland; sometimes overgrown plantations, wooded gardens and mangroves. Mainly in secondary forest in Sumatra; in China favours forest edges and clearings. Lowlands and hills, to 1500 m.

Food and Feeding. Eats large insects, especially mantids (Mantidae), crickets (Gryllidae), stick-insects (Phasmatodea), grasshoppers and locusts (Acrididae), beetles (Coleoptera), dragonflies (Odonata), large moths (Lepidoptera) and caterpillars (including hairy ones), also "grubs"; some fruit also taken (berries recorded). Usually occurs in pairs or small groups; often associates with mixed-species foraging flocks. Forages in tree crowns, also in understorey, often moving rather sluggishly; descends to the ground only very occasionally. Gleans from leaves and branches, making short sallies after disturbed insects; often sallies from a perch; pries into bark fissures on trunks and branches; also takes insects from water surfaces.

Breeding. Breeds Dec–Jun (mainly Mar–May) in India and in Mar–May in SE Asia. Nest a shallow saucer of interwoven fine grass stems, roots, twigs and tendrils, incorporating lichens and bound with cobwebs, placed on horizontal tree branch 3–9 m above ground. Eggs 2–4; no information on incubation and fledging periods.

Movements. Resident. Some local and altitudinal movements in Himalayas and Peninsular India; in N Thailand, thought to move in cold weather from open evergreen forest at 600–1400 m to dry deciduous forest at lower elevations in plains and foothills. Suspected that pioneer invaders of non-forest habitats in Peninsular Malaysia are nomadic.

Status and Conservation. Not globally threatened. Fairly common to locally common in Nepal and India; common throughout its range in SE Asia, but extinct on Singapore. Frequent in forests of Sumatra and Borneo in 1990s, but uncommon in Java. Race *latouchei* uncommon in S China; current status on Hainan (*hainanus*) unclear, but was uncommon in 1980s. Race *fretensis* regarded as "Near-threatened" in Malay Peninsula as a result of habitat loss; although it can occupy man-made habitats such as overgrown plantations, these are at a premium as agriculture intensifies. Probably has some resistance to impact of logging.

Bibliography. Ali (1969, 1986), Ali & Ripley (1996), Ali *et al.* (1996), van Balen (1999), Cheng Tsohsin (1987), Deignan (1945, 1963), Dickinson, E.C. (2003), Dickinson, E.C. & Dekker (2002a), Eames & Robson (1992), Étchécopar & Hüe (1983), Harrison & Parker (1965), Hawa (1985), Hellebrekers & Hoogerwerf (1967), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), McClure (1998), Medway & Wells (1976), Rasmussen & Anderton (2005), Ripley (1982), Robson (2000), Round (1988), Smythies (1986, 1999), Stepanyan (1995), Vijayan (1989), (1992), Wells (2005).

86. Common Wood-shrike

Tephrodornis pondicerianus

French: Téphrodorne de Pondichéry **Spanish**: Ceniciento Chico
German: Kleiner Raupenwürger

Other common names: Lesser Wood-shrike; Ceylon Wood-shrike (*affinis*)

Taxonomy. [*Muscicapa*] *pondiceriana* J. F. Gmelin, 1789, Coromandel Coast = Pondicherry, south-east India.

Taxonomic position of genus uncertain; data derived from DNA–DNA hybridization indicate that it is closer to Prionopidae and should perhaps be placed in that family, but such treatment considered premature without further research and corroborative evidence. Race *affinis* sometimes regarded as a separate species. Nominate race intergrades with *pallidus* in NW India. Four subspecies recognized.

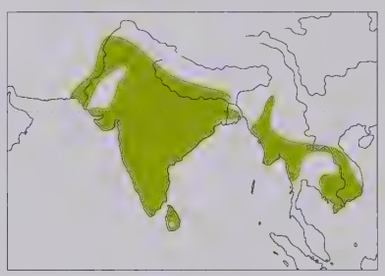
Subspecies and Distribution.

T. p. pallidus Ticehurst, 1920 – Pakistan (E Baluchistan, Punjab, Sind) and NW India (from foothills S to Gujarat and NC Uttar Pradesh).

T. p. pondicerianus (J. F. Gmelin, 1789) – India (except NW) and S Nepal and Bangladesh E to Myanmar, Thailand (except S) and C & S Laos.

T. p. affinis Blyth, 1847 – Sri Lanka.

T. p. orientis Deignan, 1948 – Cambodia and S Vietnam.



Descriptive notes. 14·5–18 cm; 18–27 g. Male nominate race is brownish-grey above, including upperwing, with pronounced whitish supercilium, grey-brown lores, blackish-brown mask from around eye to ear-coverts; rump feathers with small white tips (variable), uppertail-coverts black; rectrices blackish-brown, outer two pairs white with terminal blackish spot; cheeks and chin white; white throat and underparts, more pale ashy on breast (tinged pink in fresh plumage); axillaries and underwing-coverts ashy grey; iris dull yellow; bill dusky brown; legs dusky grey. Differs from *T. virgatus* mainly in smaller size, smaller bill, presence of white supercilium and white outer tail. Female is like male, but mask slightly paler. Juvenile has upperparts browner and spotted whitish-buff, particularly on crown and nape, upperwing-coverts broadly tipped whitish-buff, pale and dark markings on tertials, side of throat and breast mottled dusky brown; immature like adult, but not fully described. Race *pallidus* is paler than nominate, more ashy grey above and creamy below; *affinis* has shorter tail, much less obvious supercilium, and is darker, slate-grey, above, with more white on rump, wings ashy brown, remiges washed grey on outer edges, female duller, browner above, washed ashy brown below, supercilium more distinct; *orientis* is darker, dark brown-grey above, with white rumpband, strong white supercilium, darker malar area, strong brownish tinge below. Voice. Song an accelerating trill, "pi-pi-i-i-i-i-i-i"; contact calls include weak "tue" and "tee" notes, and harsher "wih-wih-whee-whee". Race *affinis* has a sweet, loud song, "fit-fwít-fwít-fwít-fwéét-fwéét" and a "chyup" call.

Habitat. Open forest, dry deciduous forest, secondary growth, bamboo forest, woodland, scrub, orchards, gardens, hedgerows, and dry open country with scattered trees. Lowlands, ascending locally to 1500 m.

Food and Feeding. Takes insects, chiefly beetles (Coleoptera), adult and larval lepidopterans, and orthopterans; also spiders (Arachnida), and some fruit. Occurs in pairs and small groups; frequently joins mixed-species foraging parties. Forages in treetops, searching diligently in bark crevices and beneath leaves; also sallies for flying insects, and sometimes takes prey on the ground.

Breeding. Season Feb–Jul. Nest built by both sexes, a small, neat, shallow cup of moss, lichen, bark or roots, bound with cobweb, lined with hair or vegetable down, placed in horizontal fork of tree branch 2–9 m above ground. Eggs 2–4; both parents incubate eggs and both feed nestlings; no information on incubation and fledging periods.

Movements. Resident; possibly some seasonal wandering.

Status and Conservation. Not globally threatened. Fairly common to common throughout its range.Widespread and common in most of Indian Subcontinent; locally fairly common in Nepal. Common in SE Asia.

Bibliography. Ali (1969, 1996), Deignan (1945), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Jerdon (1862), Khan (1988), Kotagama (1985a, 1985b), Lekagul & Round (1991), Magrath (1912), McClure (1998), Mittal & Vijay (1989), Mukherjee (1995), Rasmussen & Anderton (2005), Ripley (1982), Roberts (1992), Robson (2000), Round (1988), Smythies (1986), Sundararaman (1989), Van Tyne & Koelz (1936).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family PYCNONOTIDAE (BULBULS)



- Medium-sized, slender-bodied, short-necked passerines with rounded wings, longish tail, relatively small legs, and medium-length bill, often with prominent rictal bristles; plumage generally sombre, many with crest.
- 13–29 cm.



- Africa and southern Asia.
- Forest, woodland, scrub and thickets.
- 27 genera, 138 species, 355 taxa.
- 13 species threatened; none extinct since 1600.

Systematics

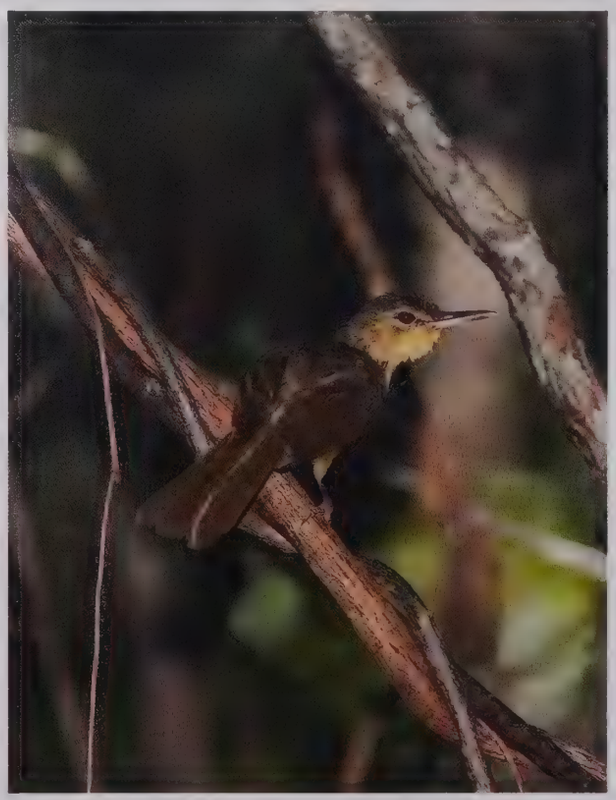
The family Pycnonotidae is a large and varied group of ten-primaried oscine passerines, widespread in Africa and southern Asia, but absent from Europe. It has reached most islands of eastern Indonesia, thus crossing Wallace's Line, but it never successfully colonised New Guinea. Its species occupy a broad range of habitats from semi-deserts to lush rainforests, with centres of diversity in the Afrotropical and Sundaic regions.

J. Delacour, in his 1943 revision of the family, considered it to constitute one of the most clearly defined groups of the oscine passerines. In other words, he felt that "the different genera and subgenera which belong to the group are obviously related to one another and rather far removed from any others", although he was careful to note that a few other genera, which may be fairly closely related to them, were difficult to classify taxonomically according to the state of knowledge existing at that time.

Over sixty years later, Delacour's view of the Pycnonotidae still largely holds good. In revising the family, he gave reasons for omitting a number of other groups assigned to it by earlier authors. These include the leafbirds (Chloropseidae), the fairy-bluebirds (Irenidae) and the ioras (Aegithinidae), and this view has been followed for the most part by subsequent authors, although there has been a recent suggestion, based on osteological evidence, that the Chloropseidae are nectarivorous bulbuls. The bulbuls have traditionally been allied with the cuckoo-shrikes (Campephagidae), with which they share dense and abundant feathering of the rump, but this association is not supported by subsequent studies, first of egg-white proteins and, more recently, of DNA. While these analyses are not consistent with one another in their findings, two of the more recent ones do, nevertheless, indicate a close relationship with the grass-warbler genus *Cisticola* and its allies the prinias (*Prinia*), the apalises (*Apalis*) and several other genera, all of which are often united in their own family (Cisticolidae). If confirmed by further research, this alliance of two groups notorious for their monotonous uniformity of plumage will doubtless strike many as fitting.

Since Delacour's revision was published, there has, however, been a considerable amount of agonizing over a number of those "other genera" which he found difficult to classify, as well as over some other subsequently suggested contenders. More recently, the position of several of these has been resolved through morphological, ecological and, especially, molecular studies, at least so far as excluding them from the Pycnonotidae is concerned, but some remain problematic. Without attempting an exhaustive review, it is worth giving a brief outline of some of the more persistent, recently resolved or unresolved cases involving taxa which are now considered not to belong with this family.

Thus, the position of the Kinkimavo (*Tylas eduardi*) of Madagascar remains uncertain. Although Delacour, A. L. Rand and H. G. Deignan and others treated this species as a bulbul, they all did so with reluctance and, more recently, the weight of opinion has been to consider it an aberrant member of the vanga family (Vangidae); indeed, it is often referred to as the Tylas Vanga, or simply the Tylas. Subsequent osteological studies have corroborated the view that it does not belong in the Pycnono-



Five Madagascan species have long been grouped with African Phyllastrephus *bulbuls. Superficially bulbul-like, they differ in voice and behaviour, and the results of genetic analyses suggest they should be removed from the family altogether. On the basis of these revelations, four are placed in* Xanthomixis, *and a fifth, the inordinately long-billed* ***Common Tetraka****, is placed in* Bernieria. *All five probably belong to a separate Malagasy radiation of passerines, as yet unnamed, but they are retained within the Pycnonotidae until the implications of this recent discovery are more perfectly understood.*

[*Bernieria madagascariensis inceleber*, Ampijoroa, Madagascar. Photo: Joe Tobias]



The bulbul sequence begins with the finchbills, a pair of allospecies typical of the family in most respects, except their stubby bills. This unusual feature possibly relates to a diet of sturdy seeds or fruit, but no such adaptive significance has been identified. Both species are social, especially in the non-breeding season, and have a year-round preference for scrub-covered slopes, clearings and broken forest. They are found in Asiatic mountains, those in south China and northernmost Vietnam being occupied by the ***Collared Finchbill****.*

[*Spizixos semitorques semitorques*, Wolong Nature Reserve, Sichuan, China. Photo: Bernard van Elegem]

tidae, although its affinity with the vangas is also tenuous. An enigma it remains.

The Malia (*Malia grata*), a denizen of mountain forests of Sulawesi, was provisionally placed with the Pycnonotidae by C. M. N. White and M. D. Bruce on account of similarities of its plumage and coloration to those of the bulbuls, and also through deduction, "because the absence of a bulbul on Sulawesi is strange". Delacour mentioned that its large feet looked like those of a bulbul that had grown bigger because of a terrestrial lifestyle. It transpires, however, that the Malia is an arboreal bird, with feet very similar to those of laughingthrushes (*Garrulax*), another group lacking a representative on Sulawesi. Its calls, and the comportment and locomotion of groups of individuals as they move through the middle stratum of the forest, are certainly reminiscent more of *Garrulax* than of any bulbul. Furthermore, the Malia differs osteologically from the bulbuls in a number of respects, including the absence of any of the nasal ossification characteristic of pycnonotids (see Morphological Aspects). For these reasons, it is considered to be better placed with the babblers (Timaliidae).

Kretschmer's Longbill (*Macrosphenus kretschmeri*) of the coastal forests of East Africa is another oddity that has in the past been considered a bulbul. It was previously treated in a monotypic genus, *Suaheliornis*, but is now placed, apparently non-controversially, with the longbills in the genus *Macrosphenus*, and is regarded as a sylviid warbler. A more recent East African departure from the family has been the Dappled Mountain-robin (*Modulatrix orostruthus*), which was originally described as a bulbul in the genus *Phyllastrephus*. It has since been established, on the basis of its structure, proportions and coloration, that this species it is not a pycnonotid, but whether it is a thrush (Turdidae), a timaliid or something else is still a matter of contention.

One possible recruit to the Pycnonotidae is the Blackcap Mountain-babbler (*Lioptilus nigricapillus*), sometimes called the "Bush Blackcap", of South Africa, which is currently placed in the Timaliidae. In several aspects of its behaviour, ecology, voice and proportions it appears to have more in common with the bulbuls than with the babblers, but, because there is no new evidence to justify its transfer, it is better left with the Timaliidae pending DNA studies.

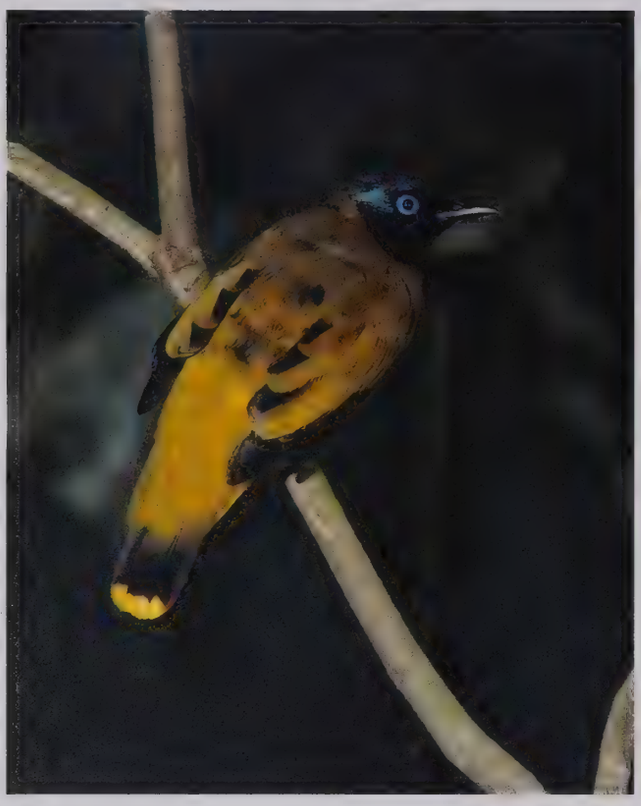
With these exclusions taken into account, the family Pycnonotidae comprises a total of 138 species. Recent DNA analysis and other studies, however, suggest that eight of these, in three genera, are probably not pycnonotids. These are the three nicators (*Nicator*), the Common Tetraka (*Bernieria madagascariensis*) and the four tetrakas in the genus *Xanthomixis*, the correct position of all of which has also long been a matter of uncertainty. Nevertheless, as these findings are sufficiently recent that their implications are not yet fully understood, the eight species in question are retained in Pycnonotidae as a matter of convenience, and are discussed further at the end of this section.

Even when taking into consideration only those undisputed members of the family, the systematic history of the Pycnonotidae has shown plenty of taxonomic uncertainty, concerning both generic attribution and species limits. One difficulty is that, although groups are highly variable, they are often not neatly separable, such that Deignan, in 1942, stated of his expanded genus *Hypsipetes*: "I have been quite unable to discover char-



With 42 species, and a span from South Africa to Japan, Pycnonotus *is the most diverse and widespread genus in the family. It seems clear, however, that its content is polyphyletic and destined to be subdivided by future reviewers. The* ***Cream-striped Bulbul****, for example, a mottle-chested bird of Sumatran forests, is currently placed by some in the subgenus* Alcurus. *An analysis of morphology, voice and genetics may well conclude that* Alcurus*, along with several other distinctive subgroups, deserves recognition as a genus, but given the complexity of relationships within* Pycnonotus *further study is required to establish firm conclusions.*

[*Pycnonotus leucogrammicus*, Mauro Sako, Sumatra. Photo: Christian Artuso]





*For many decades the **Black-headed Bulbul** generated taxonomic confusion on account of its colour morphs. The plumage of normal individuals is characterized by bright yellow tones, and grey morphs were repeatedly described as separate species. It was eventually determined that greyness was a chromatic aberration arising randomly and rarely, except on certain islands, such as Bawean in the Java Sea, where grey birds predominate.*

[*Pycnonotus atriceps atriceps*.
Left: Crocker Range National Park, Sabah, Borneo.
Photo: Doug Wechsler/ VIREO.

Right: near Negara, western Bali.
Photo: Tony Tilford]

acters which might be used to separate any one group from those others most related."

Of the 27 genera currently treated within the family, eleven are exclusively Asian and 14 are restricted to Africa and the islands of the western Indian Ocean. The remaining two are represented in both continents. The species are almost equally divided between these two regions, with 70 in Asia and 67 in Africa and the west Indian Ocean islands. The White-eyed Bulbul (*Pycnonotus xanthopygos*) is the only member of the family that extends westwards to the eastern Mediterranean, being found from Turkey and the Middle East southwards to Sinai, in extreme north-east Egypt, and to the Arabian Peninsula. Although a number of recently proposed changes in nomenclature and taxonomy have been adopted, it is highly probable that others will become necessary when the results of future research are available, and there are likely to be significant shifts in bulbul taxonomy in years to come.

A recent phylogenetic study, using mitochondrial DNA, of a suite of Asian and African species showed strong support for the monophyly of twelve African species from six genera tested, whereas for 14 Asian species from a further six genera the evidence for monophyly was much less strong. This study, in fact, raised the possibility of separate radiations across both continents, so broad was the genetic disjunction between African and Asian bulbuls. Also of significance was the fact that the Common Bulbul (*Pycnonotus barbatus*) of Africa fell firmly within the clade formed by the four Asian *Pycnonotus* species analysed, and not with the African taxa, suggesting that the open-country *Pycnonotus* bulbuls in Africa may be relatively recent colonists.

The genus *Pycnonotus*, with 42 species, is by far the largest of the family. As currently constituted, it is almost certainly polyphyletic but, in the absence of a full revision, an essentially traditional view of the genus is deemed to be the best option. An example of taxonomic history clouded by convoluted and conflicting treatments is provided by the Asian "*Pycnonotus melanicterus* complex". Forms of this complex occur in Sri Lanka (*melanicterus*), in south India (*gularis*), in north India, Myanmar and south to Thailand and Indochina (*flaviventris*, along with a range of other forms), in Sumatra and Java (*dispar*) and in Borneo (*montis*). In the 1950s, Deignan eventually united Bornean *montis* and Sri Lankan *melanicterus* with *dispar*, bringing the process of lumping to its conclusion, which resulted in a widespread and highly variable species, the "Black-crested Bulbul" (*P. melanicterus*). He argued that all characters, such as the presence or lack of a crest, of a red throat, of white tail tips, and so on, arose independently throughout the complex. Nevertheless, while it is clear that all of these bulbul forms derive from a common ancestor, they have diverged significantly, and it now seems that elevation of most of them to full species rank is justified, especially in view of the differences in voice and behaviour that were not apparent to the museum workers who made the decision to lump all forms in the first place. When representative specimens of all these forms are laid in a row, starting with Sri Lankan skins and ending with Bornean ones, they reveal a degree of morphological variation that would be hard to sustain were they all members of a single species. Most interestingly, the first in the sequence, *melanicterus*, is very similar to the last, *montis*, but a whole range of features is found in between.

The recurrent variable is a red throat, this being standard in some populations and representing a colour morph in others. Variation in crest length, wing length and the colour of the upperparts is highly marked and seems to justify the treatment of these forms as full species, as also do differences in structure and voice. In some cases, however, the variation is clinal, blurring the issue. The most sensible solution would appear to be to treat each of the outlying distinct forms as monotypic species, respectively the Bornean Bulbul (*Pycnonotus montis*), the Black-capped Bulbul (*Pycnonotus melanicterus*), the Flame-throated Bulbul (*Pycnonotus gularis*) and the Ruby-throated Bulbul (*Pycnonotus dispar*), and to keep the South-east Asian forms intact as a polytypic species, the Black-crested Bulbul (*Pycnonotus flaviventris*), thus reverting to a position close to the classification in vogue a century ago. Much of the wide variation among the populations of the last-mentioned species is clinal, or the manifestation of colour phases. A red or orange throat is a permanent feature of the south Indian Flame-throated Bulbul and the Indonesian Ruby-throated Bulbul. It appears with variable frequency in several continental races of the Black-crested Bulbul in South-east Asia; strangely, it is very common in some localities, such as parts of the east Thailand plateau, accounting for most of the population of the subspecies *johnsoni* there, but it is almost absent in other parts of the range of the same subspecies.

Both *gularis* and *dispar* have at times been called the "Ruby-throated Bulbul". Indeed, the former was once very commonly identified by this appellation. In choosing which of the separated forms would take this English name, one must take into account the accuracy of the description. The throat of *dispar* equates much

more closely to the colour of rubies than does the throat of *gularis*, which, as Viscount Walden noted in 1866, is "a bright flame-coloured orange". Thus, *dispar* merits the name "Ruby-throated Bulbul", while *gularis* is more appropriately named the "Flame-throated Bulbul".

The entire "*P. melanicterus* complex" was previously placed in a separate genus, *Rubigula*. This was later lumped with *Pycnonotus*, as were several other earlier genera. The Straw-headed Bulbul (*Pycnonotus zeylanicus*) was formerly placed in the genus *Trachycomus*, the Striated Bulbul (*Pycnonotus striatus*) and its allies in *Alcurus*, the Red-whiskered Bulbul (*Pycnonotus jocosus*) and its allies in *Otocompsa*, the Black-headed (*Pycnonotus atriceps*) and Grey-headed Bulbuls (*Pycnonotus priocephalus*) and a few others in *Brachypodius*, the Asian Red-eyed Bulbul (*Pycnonotus brunneus*) and its allies in *Brachypus*, the Puff-backed Bulbul (*Pycnonotus eutilosus*) in *Euptilosus*, the Black-and-white Bulbul (*Pycnonotus melanoleucos*) in *Microtarsus*, and the Scaly-breasted (*Pycnonotus squamatus*) and Grey-bellied Bulbuls (*Pycnonotus cyaniventris*) in *Ixidia*. This lumping of many genera in *Pycnonotus* in the first half of the twentieth century by ornithologists such as Delacour and Deignan seems somewhat over-zealous today, and combines a miscellany of groupings which exhibit dramatically different vocal, behavioural and morphological characters. A strong case can be made for resurrecting most of these historical genera, as this would more accurately convey the diversity of forms currently dumped in an excessively heterogeneous *Pycnonotus*. Moreover, the sequence used to crowd this diversity of forms together under a single name seems to disconnect related taxa. When the puzzle is finally deciphered using an up-to-date analysis of genetics, morphology and voice, the traditional sequence will no doubt be viewed as hopelessly inaccurate. Be that as it may, it is probably better to refrain from subdividing or rearranging the genus until such a review is undertaken.

A number of races of the Common Bulbul are sometimes treated as full species. These include *tricolor*, *dodsoni* and *somaliensis*. It has been claimed that the nominate race and these three all meet in Ethiopia without interbreeding and that the nominate race and *tricolor* occur sympatrically in other parts of their ranges; equally, it has been claimed that all are linked by a series of populations exhibiting intermediate characters. Further study is clearly needed. The Common Bulbul is, however, parapatric and locally sympatric with both the African Red-eyed Bulbul (*Pycnonotus nigricans*) and the Cape Bulbul (*Pycnonotus capensis*), and it hybridizes extensively with both in narrow transition zones along at least part of the boundaries between their respective distributions. Hybrids exhibit variably intermediate characters, including a wide range of variation in size and, particularly, in the colour of the eye wattles, which may differ from those of either parent. For example, typical Common Bulbuls have a narrow black wattle, and typical African Red-eyed Bulbuls have a wattle that is wide and bright orange. In the phenotypic hybrids, the wattle may be black with some faint yellow tinges, half black, half dull yellow, completely dull yellow, dull orange or bright orange.

This may be of significance in the interesting problem posed by the Blue-wattled Bulbul (*Pycnonotus nieuwenhuisii*) of the Sundaic region of Asia. Only two old specimens of this form exist; one is from Borneo and the other from Sumatra. On the basis of these specimens, and from recent sightings in Brunei, in north Borneo, a theory has been forwarded that this bulbul represents a hybrid form. While it seems inevitable that one parent must be the Black-headed Bulbul, the identity of the other is less certain but has been postulated as being the related Grey-bellied Bulbul. This would explain the head pattern, but the conspicuous blue wattles and the unusual tail pattern would have to have been thrown up randomly. The hybrid theory seems attractive as an explanation for the lack of reports of this bulbul in Malaysia and Indonesia, despite increasing amounts of fieldwork in the region's forests, but there are a few problems with it. The light blue wattles around the eyes of the adult are a feature not exhibited by any other pycnonotid, suggesting that hybridization has produced a striking novel character. This is not impossible, but it does seem unlikely; in the African hybrid examples, all of the parent species possess wattles. Thus, while there is some evidence consistent with a hybrid origin, this is by no means proven, and for the time being the Blue-wattled Bulbul is considered best treated as a full species. It is perhaps merely difficult to find, possibly because of nomadic tendencies or some specialized habitat requirements. If it is found to be a valid taxon, it is one of the world's most poorly known and inexplicably rare species of bird (see Status and Conservation).

Undoubted instances of hybridization are known in Pakistan, where three taxa often interbreed, producing fertile hybrids. These are the Red-vented Bulbul (*Pycnonotus cafer*) of the race *intermedius*, the Himalayan Bulbul (*Pycnonotus leucogenys*) and





*The **Ruby-throated Bulbul** differs from the **Black-crested Bulbul** in a range of features, including its shorter crest, its pin-like red throat feathers and its vocalizations. The two forms are clearly related, however, and have normally been treated as conspecifics within a widespread taxon called* "Pycnonotus melanicterus". *Given the morphological, vocal and behavioural variation within this taxon, it seems appropriate to restore a narrower view of species limits, thus reverting to the complex of five allospecies familiar to early taxonomists.*

[Left: *Pycnonotus dispar*, Selat, Karangasem, Bali. Photo: Tony Tilford.

Right: *Pycnonotus flaviventris caecilii*, Fraser's Hill, Malaysia. Photo: Morten Strange]



Taking the date of first description as a measure of seniority, the three oldest species in Pycnonotus *are the Red-whiskered Bulbul* (P. jocosus)*, the Cape Bulbul* (P. capensis) *and the Red-vented Bulbul* (P. cafer)*. Indeed, these were the only bulbuls to appear in the volumes of* Systema Naturae*, published by Linnaeus around 1760. While* jocosus *forms part of the subgenus* Otocompsa*,* capensis *and* cafer *each form the crux of a species complex, the former chiefly African, the latter Asiatic, which together make up the core of classic* Pycnonotus *species. The* capensis *and* cafer *superspecies boasts several members, one of which is the* ***African Red-eyed Bulbul****. All are birds of scrubby country, wooded gardens or open forests, and their morphology is relatively constant. They are familiar, inquisitive, opportunistic birds, with strong multi-purpose bills and stout legs. In terms of patterning there is a tendency for dark plumage on the head, sometimes exaggerated by crests, or offset by contrastingly coloured eyerings. The close evolutionary relationship between these allospecies, and with their nearest allies in* Pycnonotus*, manifests itself most conspicuously in contact zones where interbreeding is frequent.*

[*Pycnonotus nigricans nigricans*, Kalahari Gemsbok National Park, South Africa. Photo: Alan Wilson/ Photo Access]



*The **Orange-spotted Bulbul** is an island form, endemic to the montane forests of Java and Sumatra, where it is locally common. Its comportment and voice are recognizably bulbul-like, but it differs from continental* Pycnonotus *species in several ways. Its bill is relatively slender, and its facial markings are unique. As with most of its congeners in the Sundaic realm, knowledge of its behaviour, ecology and true taxonomic affinity is extremely sketchy. Likewise, its membership of* Pycnonotus *is tentative, and in need of resolution via a thoroughly sampled and systematic review.*

[*Pycnonotus bimaculatus*. Photo: Brian J. Coates]

the White-eared Bulbul (*Pycnonotus leucotis*). In north Pakistan, hybrids between the last two form a swarm, sufficiently distinct that it was described as a separate subspecies, "*humii*". Although, away from this region, the two species are morphologically distinct, this hybrid swarm is enough to convince some taxonomists that the White-eared and Himalayan Bulbuls should be treated as conspecific. Less commonly, these two interbreed with the race *intermedius* of the Red-vented Bulbul, again producing fertile hybrids. This situation, and others like it, led to serious confusion among early systematists, who described several new species or subspecies from what were, in fact, hybrids. These circumstances also reveal how narrow the genetic distance between various bulbul forms is, and provide interesting case studies illustrating the process of speciation and tests of the various definitions of species limits.

Taxonomic problems were thrown up also by the different morphs of the Black-headed Bulbul. At one time or another these were described as separate species, such as "*P. cinereiventris*" from north-east India and "*P. chalcocephalus*" from Java, and it was many decades before it was determined that they were merely morphs. Back in 1878, that astute observer A. O. Hume noted that "it is a curious fact that you can manufacture *cinereiventris*, or the Sumatra *chalcocephalus*, or any intermediate form to any extent by the use of a little carbolic acid. Where the colour is pure yellow, as at the tips of the tail, the feathers come out *white*, as in these parts in *chalcocephalus*, but wherever the peculiar yellow olivaceous green prevails, there the feathers remain of the exact ash grey that we find in *cinereiventris* and *chalcocephalus*." He went on to deduce that what had happened appeared to be simply that, for some reason, the skin had in some parts, as with *cinereiventris*, or wholly, as with *chalcocephalus*, ceased to secrete the yellow pigment. This theory met with strong opposition at first, but was later proved correct. Individuals with no yellow pigment arise haphazardly throughout the population. They are usually rare but, oddly, they are common in some regions, as on the island of Bawean, north of Java.

In line with this lumping of colour variants, the form discovered and described by Hume as "*Brachypodius fuscoflavescens*" was soon treated as a washed-out race of the Black-headed Bulbul restricted to the Andaman Islands. It has recently been revealed that it exhibits constant differences from other races of this polymorphic species in a suite of plumage features, as well as in voice, and it is therefore accorded full species status as the Andaman Bulbul (*Pycnonotus fuscoflavescens*). If the genus *Pycnonotus* is broken up into constituent subgroups, as described above, this island form will once again bear the name applied to it by Hume in 1873. Several other isolated forms of *Pycnonotus* are almost certainly worthy of recognition at the species level. One obvious case is that of the Bornean subspecies *leucops* of the Flavescent Bulbul (*Pycnonotus flavescens*). This taxon, often referred to as the "Pale-faced Bulbul", must have been isolated for a very long time; it is much more divergent than are the other races of the Flavescent Bulbul, and apparently has different vocalizations. The upgrading of this and several other taxa to the rank of species is, however, better postponed until proper and full documentation is available.

In the past, the African genus *Andropadus* has often been merged with *Pycnonotus*, but the more recent preference has been to regard the two as separate. Differences in plumage, behaviour and ecology seem fully to justify this split, even before it was corroborated by the latest DNA evidence. Although twelve species are placed in *Andropadus*, this arrangement carries little conviction on two counts. One is that it is highly likely that, as currently constituted, *Andropadus* is polyphyletic, and should probably be split into two or more genera, while the second is that there is some evidence to suggest that one, and possibly more, forms presently treated as subspecies may warrant species status. A number of recent studies, particularly the molecular analyses and phylogenetic work of M. Roy and co-workers, have shed some light on the interrelationships within the genus. These have focused on the montane bulbuls of eastern Africa and the Cameroon Highlands, and have demonstrated that these pycnonotids constitute a monophyletic group that probably originated in the Pleistocene. This group is provisionally treated as comprising five species: the Stripe-cheeked Greenbul (*Andropadus milanjensis*), Shelley's Greenbul (*Andropadus masukuensis*), the Cameroon Montane Greenbul (*Andropadus montanus*), the Western Mountain Greenbul (*Andropadus tephrolaemus*) and the Eastern Mountain Greenbul (*Andropadus nigriceps*). In earlier years, the East African *masukuensis* was often treated as synonymous with the West African *montanus*, but plumage and vocal

The results of an analysis of evolutionary relationships within the genus Pycnonotus *might reveal that the **Stripe-throated Bulbul** groups together with Sundaic taxa, rather than with its congeners in south Asia and Africa, and also that two species are involved. The crown, ear-coverts and throat of the most familiar races,* eous *and* finlaysoni, *are streaked with yellow, but this feature is greatly subdued in the poorly known form* davisoni. *Given the presumed importance of facial patterning in courtship behaviour,* davisoni *might warrant treatment as a separate species. The best place to investigate this notion is the lower Sittang River, in Myanmar, as here the ranges of* finlaysoni *and* davisoni *approach very closely, or even meet.*

[*Pycnonotus finlaysoni eous*, Khao Yai National Park, Thailand. Photo: Suppalak Klabdee]





The bulbuls have acquired a reputation as boring and wearisome birds, an impression amplified by their unadventurous plumage and brazen ubiquity. One species guilty of bringing the entire family into disrepute is the ***Cream-vented Bulbul****, a bird that might qualify as the embodiment of tedium were it not for its startling eyes. In several bulbuls, uniform coloration is alleviated by a contrasting iris, a recurrent feature that is probably significant in signalling systems, but phylogenetically trivial. The iris in this species is strikingly white, for example, except on Borneo, where a red-eyed morph predominates.*

[*Pycnonotus simplex simplex*,
Singapore.
Photo: Ong Kiem Sian]

details and DNA evidence indicate that they are clearly distinct. Similarly, *tephrolaemus* and *nigriceps*, from western and eastern Africa, respectively, have in the recent past often been considered conspecific, but they differ in several respects, including plumage, behaviour and voice. Molecular data support this separation and, moreover, indicate that *tephrolaemus* is most closely related to *masukuensis*, with which, indeed, it shares some vocal and behavioural similarities, and that these two species form a clade with *montanus*. The relationship between *tephrolaemus* and *nigriceps* therefore appears more distant.

Relationships within the polytypic *nigriceps*, the Eastern Mountain Greenbul, are, however, less clear. Of the six subspecies generally recognized, it has been suggested that, on the basis of genetic distinctness, the three southern races, *fusciceps*, *chlorigula* and *neumanni*, collectively form a separate species from the northern nominate race, *kikuyuensis* and *usambarae*. Since, on the one hand, DNA evidence suggests that further splitting within both groups could also be justified and, on the other, there is a lack of coherent supporting behavioural and, especially, vocal studies, it is nevertheless deemed better to adopt a conservative approach. Similarly, the elevation to species level of one or more subspecies of both Shelley's Greenbul and the Stripe-cheeked Greenbul has also been proposed, but the justification for these treatments is either not clear or, from the evidence hitherto advanced, not convincing.

Although the lowland species of *Andropadus* are less well studied, it seems apparent that their relationship with the montane group is fairly distant; the lowland species are thought to be much



The genus Pycnonotus *was once even more inclusive than it is today, embracing twelve species now placed in* Andropadus. *Although the separation of these two genera is corroborated by plumage, behaviour and ecology, as well as the latest DNA analysis, it seems that* Andropadus *itself is polyphyletic, and thus requires further subdivision. The* ***Little Greenbul****, for example, is essentially a lowland species which, on the basis of bare-part colours, vocalizations and ecology, is only distantly related to its montane congeners. Moreover, its upper mandible bears a number of serrations, which montane forms do not possess.*

[*Andropadus virens virens*,
above Etome,
Mt Cameroon, Cameroon.
Photo: Doug Wechsler/
VIREO]

older, having originated in the early Miocene. Intriguingly, a number of early taxonomic studies placed the montane bulbuls in the genus *Arizelocichla*, on the basis of differences of bill morphology: in particular, these montane forms lack the serrations, or "teeth", on the distal edges of the upper mandible that are present in the lowland species. These older studies also divided the lowland *Andropadus* among up to five separate genera, and it is likely that further phylogenetic work will reveal that the current arrangement is too simplistic. Preliminary molecular data indicate that the Slender-billed Greenbul (*Andropadus gracilirostris*), in particular, is not closely related to any other member of the genus. The Grey Greenbul (*Andropadus gracilis*) and Ansorge's Greenbul (*Andropadus ansorgei*) form a species pair to which the Plain Greenbul (*Andropadus curvirostris*) may prove to be closely related. All three are morphologically and behaviourally distinct from both the Yellow-whiskered Greenbul (*Andropadus latirostris*) and the Little Greenbul (*Andropadus virens*), which, on the basis of bare-part colours, vocalizations and ecology, appear to be most closely related to each other. The relationship of the Sombre Greenbul (*Andropadus importunus*) with its congeners is unclear.

Phylogenetic studies of the genera *Chlorocichla*, *Thescelocichla* and *Pyrrhurus* would also be instructive. In particular, the Yellow-throated Greenbul (*Chlorocichla flavicollis*) appears, from similarities of vocal and other behavioural features, to be more closely related to the Swamp Palm Bulbul (*Thescelocichla leucopleura*) and the Leaf-love (*Pyrrhurus scandens*) than it does to its congeners. In addition, further studies of the relationships of two subspecies of the Yellow-throated Greenbul are called for. In Cameroon, the yellow-throated nominate race is reported as occurring to within 50 km of the white-throated subspecies *soror* in the area of the Adamaoua Plateau. No intergrades are known, and the situation has recently become more intriguing with the realization that there are some vocal differences between them, and with the discovery that populations of the nominate race in Mali do not to respond to playback of the song of *soror*.

The Leaf-love is sometimes included in *Phyllastrephus*, but it differs in not having the long, slender, laterally compressed bill of that genus and in its noisy, extrovert behaviour. The 17 species of *Phyllastrephus* currently recognized are, indeed, remarkably homogeneous in morphology and behaviour. Drably coloured, they are quintessential skulking brown birds of the undergrowth of thickets, galleries, forest edge and, less often, forest interior. The montane Yellow-streaked Greenbul (*Phyllastrephus flavostriatus*) and Grey-headed Greenbul (*Phyllastrephus poliocephalus*) from, respectively, eastern Africa and the Cameroon Highlands form a superspecies and are perhaps the most distinctive. They differ from all others in their conspicuous foraging behaviour, which involves hopping rapidly along horizontal branches, mainly in the middle strata and canopy, peering first over one side and then over the other, and probing periodically. The Yellow-streaked Greenbul is further unusual both in its distinctive habit of deliberately, rapidly and obviously raising and lowering one wing and in its loud song, neither of which is exhibited by the Grey-headed Greenbul. It has been suggested that one or more of the eight subspecies of the Yellow-streaked Greenbul merits species status, with the distinctive brown-headed *alfredi* the most obvious candidate; this, however, differs little vocally from the other subspecies and, biogeographically, it is sandwiched between grey-headed races to the north and south. The case therefore seems unproven, but is worthy of further study.

Presenting considerable identification problems, the Icterine Greenbul (*Phyllastrephus icterinus*) and Xavier's Greenbul (*Phyllastrephus xavieri*), a sympatric species pair, are the only two members of the genus commonly found in the lowland rainforests of West and Central Africa. Also distinct in the amount of yellow in the plumage, they have sometimes been placed in a separate genus, but this seems unwarranted. The relationship of the Icterine Greenbul with two other pycnonotids, tentatively treated as full species, requires investigation. The first of these is the Liberian Greenbul (*Phyllastrephus leucolepis*), known only from a unique type specimen and some field observations of a few other individuals at the type locality, in eastern Liberia. Apart from the distinctive subterminal row of whitish spots on the primaries, secondaries, greater wing-coverts, alula and median and greater primary coverts, from which it takes its alternative name of Spot-winged Greenbul, it is morphologically identical to the Icterine Greenbul. Were it not for the observations of its collector, W. Gatter, who reported that the bird, when foraging, appeared to flick both wings at the same time, holding them partly open, which he interpreted as a possible visual signal, one would be tempted to treat the Liberian Greenbul as an aberrant Icterine Greenbul. The other species is Sassi's Olive Greenbul (*Phyllastrephus lorenzi*), the most distinctive features of which, the head colour and pattern, seem to intergrade with those of the Icterine



The genus Chlorocichla *contains a relatively well-defined grouping of six African species. All are bulky, dull-coloured bulbuls with strong bills and sturdy legs. The* ***Yellow-bellied Greenbul****, perhaps the most familiar species in the genus, is distributed from Somalia to South Africa down the eastern seaboard, where it tends to be common in coastal habitats. Like its congeners, it avoids tall forest, but thrives at forest edges, or in more open brushland and savanna. This individual is visiting a thorn-scrub watering-hole to quench its thirst.*

[*Chlorocichla flaviventris flaviventris*, Mkuzi Game Reserve, South Africa. Photo: Hanne & Jens Eriksen]



The genus Phyllastrephus *contains 17 species, most of which are semi-terrestrial (the name itself, meaning "leaf-tosser", is fairly appropriate). The* ***Terrestrial Brownbul*** *is a typical example. It spends much of its time noisily scratching about in leaf litter with its bill and feet. Although most often found at or near ground level, it is sometimes found up to 12 m higher, probing into dead-leaf clusters and creeper tangles. Like its relatives it is drably coloured, and lives in groups in scrub and woodland understorey, where it is retiring and difficult to see.*

[*Phyllastrephus terrestris terrestris*, Nature's Valley, Southern Cape, South Africa. Photo: Geoff McIlleron]

Greenbul where the two co-occur in eastern DRCongo. Otherwise differing only in its darker overall coloration, it may prove to be a melanistic form of *icterinus* (see also Morphological Aspects). Resolution of these two puzzles must await further study, particularly of vocal and DNA data.

The Toro Olive Greenbul (*Phyllastrephus hypochloris*) has, in the past, been treated as a subspecies of Baumann's Greenbul (*Phyllastrephus baumanni*). Even on morphological grounds this seemed inappropriate; now that the vocalizations of both are known, there can be little, if any, justification for it. In a similar instance, Fischer's Greenbul (*Phyllastrephus fischeri*) has been considered a subspecies of Cabanis's Greenbul (*Phyllastrephus cabanisi*). The two differ, however, in several respects and have recently been found to occur sympatrically, and been observed together in mixed-species flocks, in the Udzungwas, in Tanzania. The subspecies *placidus* of Cabanis's Greenbul has sometimes been treated as a separate species, but it is vocally very similar to the latter and, furthermore, it has been shown that *placidus* from Malawi reacts strongly to tapes of the voice of *cabanisi* from Zambia.

The genus *Bleda* has undergone revision over the last decade or so. Acoustic and morphological studies carried out by C. Chappuis and C. Érard showed that the taxa *notatus* and *ugandae*, hitherto treated as subspecies of the Green-tailed Bristlebill (*Bleda eximius*), were, in fact, more closely related to the Grey-headed Bristlebill (*Bleda canicapillus*). These authors went further, however, and proposed that *notatus*, with *ugandae* as a subspecies, warranted recognition as a full species, forming a superspecies with the Grey-headed Bristlebill. As a result, the Green-tailed Bristlebill became monotypic and was suggested as forming a species pair with the Red-tailed Bristlebill (*Bleda syndactylus*). This arrangement has been questioned by the recent findings of



The ***Northern Brownbul*** *resembles the Terrestrial Brownbul* (Phyllastrephus terrestris) *in appearance, behaviour, and choice of habitat, both being found in a variety of dense thickets. Naturally, they are often confused where their ranges overlap in parts of coastal Kenya and north Tanzania. The Northern Brownbul is slightly smaller and warmer brown above, generally lacking olive tones. It also has a duskier throat than its southern counterpart. They are most easily distinguished by voice, the song of the Northern being a harsh penetrating chatter, faster in pace and higher in pitch than that of the Terrestrial.*

[*Phyllastrephus strepitans*, Athi River, Kenya. Photo: Morten Strange]

P. Beresford, whose molecular studies indicate that *syndactylus* is, rather, the sister-taxon to the rest of the genus as a whole. In addition, her data, while supporting species rank for *notatus*, suggest that *ugandae* may also merit full species status in its own right. Although there is some morphological and vocal evidence in support of this, it is not unequivocal, and further field studies are needed before this step is taken.

Until recently, five African and six Asiatic bulbuls were united in the genus *Criniger*, but this was increasingly seen as an incongruous grouping. Major differences in morphology, voice and behaviour suggested that the two sets of species did not share a recent ancestor. DNA analysis has revealed that the expanded genus *Criniger* proposed by Delacour in 1943, and by Rand and Deignan in 1960, was indeed polyphyletic. On this basis, the Asian species warrant separation in a genus of their own, for which the name *Alophoixus*, erected by E. W. Oates in 1889, is available.

Within *Criniger*, now restricted to Africa, the White-bearded Greenbul (*Criniger ndussumensis*) was formerly regarded as a subspecies of the Yellow-bearded Greenbul (*Criniger olivaceus*). Notwithstanding the vocal similarity between the two, however, the differences in coloration are considerable, such that it seems difficult to argue for their conspecificity. Indeed, the majority of modern authors have treated these bulbuls as two separate species. Recent DNA analyses have supported this view, and have even led to the rather surprising conclusion that *olivaceus* appears to be sister-taxon of the Red-tailed Greenbul (*Criniger calurus*), rather than of *ndussumensis*.

As for *Alophoixus*, taxonomic conundrums abound. The White-throated Bulbul (*Alophoixus flaveolus*), the Puff-throated Bulbul (*Alophoixus pallidus*) and the Ochraceous Bulbul (*Alophoixus ochraceus*) contain a range of confusing forms, the allocation of which to species has fluctuated over the years. The situation becomes especially complex in parts of South-east Asia, and the current delimitation and assignment of subspecies is tentative at best. A full review is required, particularly in south Myanmar, where the patterns of distribution and variation are poorly understood. Two of the remaining three members of the genus, Finsch's Bulbul (*Alophoixus finschii*) and the Yellow-bellied Bulbul (*Alophoixus phaeocephalus*), seem rather divergent in terms of morphology, behaviour and voice, and possibly deserve to be isolated in monotypic genera.

Another classic case of bulbul systematics and nomenclature being dogged by chronic confusion is provided by the generic name *Ixos*. Originally instated by C. J. Temminck in 1825, based on his "*Turdus phoenicopterus*", it was Deignan who, in 1942, reported that the name *Ixos* was invalid owing to its type species being not a bulbul, but a campephagid. Deignan employed the name *Microscelis* as the next oldest valid name applicable to the group. He had considered *Hypsipetes*, erected by N. A. Vigors in 1831, to be preoccupied by a lepidopteran genus described in 1829, and therefore unavailable. It eventually transpired, however, that the supposed preoccupant was spelt as "*Ypsipetes*", and that *Hypsipetes* was therefore a valid name, and *Microscelis* its junior synonym. As such, when Rand and Deignan undertook the biggest review of the family to date, in 1960, they used the name *Hypsipetes* for their expanded genus. More recently, it has been shown that the type of *Ixos* is, in fact, a bulbul after all, and thus *Ixos*, being an older name, has priority over both *Microscelis* and *Hypsipetes*. In any case, the priority of one name over another is no longer relevant as recent work suggests that the best treatment is to subdivide this group once again into its constituent parts, as to do otherwise would render it polyphyletic. Hence, there are now nine species in *Ixos* and seven in *Hypsipetes*, with *Microscelis* as a monotypic genus containing the Brown-eared Bulbul (*Microscelis amaurotis*).

By enlarging *Hypsipetes*, Rand and Deignan gathered a motley band of bulbuls into a single genus in an attempt to solve, or at least to gloss over, the systematic problems posed by this heterogeneous group. As it happens, several taxa sat rather uncomfortably in their sequence, and they have been subsequently removed. In 2002, E. C. Dickinson and S. M. S. Gregory stated that "In addition to *affinis* and *ictericus* the peculiarities of *thompsoni* stand out"; they place these three in the respective genera *Thapsinillas*, *Acritillas* and *Cerasophila*, an arrangement which seems at present to be the most sensible. In addition, further to the resurrection of *Ixos* and *Microscelis*, three more small genera are now usually removed from *Hypsipetes*: *Tricholestes* (one species), *Iole* (three species), and *Hemixos* (three species).

Most of these groups are unlikely to remain stable in their current format. The structure and content of *Ixos*, for example, appears to require modification. The inclusion in this genus of the Sulphur-bellied Bulbul (*Ixos palawanensis*) and the Nicobar Bulbul (*Ixos nicobariensis*) seems tentative at best, and a more thorough review of voice and morphology, coupled with genetic analysis, will probably result in their removal, perhaps to monotypic genera. In addition, justification can be made for elevation of the taxon *cinereiceps*, from the Philippine islands of Tablas and Romblon, to the rank of full species, distinct from the Streak-breasted Bulbul (*Ixos siquijorensis*), since it differs from the latter significantly in voice and morphology. Given that the



The genus Bleda *includes four understorey species known as bristlebills. Ecologically, they are perhaps the closest African equivalent to the swarm-following Neotropical antbirds (Thamnophilidae). Interestingly, the bristlebills have patches of bare bluish skin around the eyes, similar to those found in the antbird genera* Myrmeciza *and* Rhegmatorhina. *While these are much reduced in the nominate race of the* ***Lesser Bristlebill****, it has bright yellow loral spots which, when prominently displayed, stand out like headlamps on the forest floor.*

[*Bleda notatus notatus*, above Etome, Mt Cameroon, Cameroon. Photo: Doug Wechsler/ VIREO]



*The **White-throated Nicator** is one of three species in the genus* Nicator*, the taxonomic placement of which is hotly disputed. It has traditionally been placed alongside the bush-shrikes (previously Laniidae, now Malaconotidae), but recent treatments have grouped it with bulbuls, and its position continues to vacillate between these two options. Evidence for each is equivocal, and some features of* Nicator *are unique. It comes as no surprise, therefore, that recent DNA analysis suggests that* Nicator *is closely related neither to the bulbuls nor to the bush-shrikes, but likely deserves a family of its own.*

[*Nicator gularis*, near Marromeu, Mozambique. Photo: Hugh Chittenden]

Streak-breasted Bulbul is already considered globally Endangered, the two species resulting from such a split may warrant a higher category of threat, especially *cinereiceps*, as the native forests and scrublands of Tablas and Romblon are small and dwindling (see Status and Conservation).

The "*Thapsinillas affinis* complex" in the Wallacean islands of Indonesia presents a knotty problem. The geographical distribution of distinctive characters is unusual. For example, the forms in Seram and the Sula Islands share the feature of yellow in the tail, but an intervening form on Buru lacks this character; meanwhile, both the Buru and the Seram forms have yellow lores, a feature lacking in the Sula population. Such irregular variation renders this complex difficult to review. Nevertheless, the songs of the Seram, Ambon and Buru populations exhibit very considerable differences from the songs of other races to the north and west, such that the former can be separated as the Southern Golden Bulbul (*Thapsinillas affinis*), and all the latter lumped as the Northern Golden Bulbul (*Thapsinillas longirostris*). In truth, these resultant taxa will almost certainly require further subdivision, in view of significant differences between the various island populations. Nonetheless, our preference is to separate them as a preliminary measure, drawing attention to the broadest rift in the complex, and paving the way for appropriate fieldwork and research into the song, morphology and genetics of all taxa involved. If separated as full species, some island races would prove to be very rare. In particular, the divergent form on Sangihe Island (*platenae*) is restricted to a tiny area of ridge forest on Gunung Sahengbalira, where it is thought that only 20–230 individuals survive. In such cases, taxonomic review is vital for the compilation of a realistic conservation strategy for Wallacea, and must be made a priority.

After the excision of so many disparate forms, the genus *Hypsipetes* now contains a relatively homogenous grouping of species, known collectively as the "black bulbuls." At its most inclusive, *Hypsipetes madagascariensis* served as a holding bay for all forms of black bulbul, spanning the Indian Ocean and continental Asia, from Madagascar to central China, but it is now widely accepted that the Malagasy and Asiatic forms represent separate lineages.

On the Asiatic mainland, all forms have traditionally been lumped under the name *Hypsipetes leucocephalus*, an assemblage that will probably be broken up into three or more species when more data becomes available. At the moment it seems safe to treat the isolated races in southern India (*ganeesa*) and Sri Lanka (*humii*) as the Square-tailed Black Bulbul (*Hypsipetes ganeesa*), although vocal differences between them suggest that two species may be involved. The white-headed races breeding in China (*stresemanni*, *leucothorax* and *leucocephalus*) are possibly distinct from adjacent black-headed forms (e.g., *sinensis*, *ambiens* and *concolor*), but, given the complexity of the situation, and the lack of pertinent information, all are retained within the Himalayan Black Bulbul (*Hypsipetes leucocephalus*). A full review of genetic, morphological, vocal and behavioural variation within this grouping is required, along with an analysis of hybrid zones.

The Malagasy lineage can be subdivided, on the basis of recent evidence, into five species, each confined to a single island, or group of islands. Recent molecular studies have supported the opinion that the Reunion Black Bulbul (*Hypsipetes borbonicus*) is specifically distinct from the Mauritius Black Bulbul (*Hypsipetes olivaceus*), as indicated by differences in their behaviour, voice and eye colour; the molecular data also suggest, however, that the latter is, in fact, sister-taxon to the Madagascar Black Bulbul (*Hypsipetes madagascariensis*). This work has, moreover, helped to resolve further the hitherto confused situation in the Comoros, where the existence on Grand Comoro (Njazidja) and Mohéli (Mwali) of a second *Hypsipetes*, in addition to the undisputed presence of *H. madagascariensis* on all four main islands, has long been contentious. The Comoro Black Bulbul (*Hypsipetes parvirostris*) has had a chequered taxonomic history. Shortly after its initial description, as a full species, from Grand Comoro, it became treated as a hybrid between the Madagascar Black Bulbul and the Seychelles Black Bulbul (*Hypsipetes crassirostris*). Subsequently, all forms of *Hypsipetes* in the Comoros were considered sufficiently distinct in combination from the Madagascar populations of *H. madagascariensis* to merit subspecific rank, for which the name *parvirostris* was used, despite the fact that the type of *parvirostris* was the "aberrant" olivaceous form. Meanwhile, the larger olivaceous *moheliensis* had been described as a subspecies of *H. crassirostris*. It has now been established, however, that the olivaceous phenotype does constitute a separate species, *H. parvirostris*, and that it behaves as a parapatric vicariant of *madagascariensis*, replacing it



Until recently the genus Criniger *united five African and six Asiatic bulbuls, all of them boisterous, group-living forest birds with expressive crests and pale throat feathers that are often puffed out in display. Fieldworkers familiar with both continents, however, noted major differences in morphology, voice and behaviour between the African forms, such as the* ***Eastern Bearded Greenbul****, and the Asian ones, and began to suspect that these groups did not share a recent ancestor. The results of DNA analysis support this view, and the two sets of species are now separated, with the result that* Criniger *is restricted to the Afrotropics.*

[*Criniger chloronotus*, above Etome, Mt Cameroon, Cameroon. Photo: Doug Wechsler/ VIREO]

in montane forest habitats. Furthermore, *parvirostris* on Grand Comoro exhibits some acoustic and size differences from the olivaceous form found on Mohéli, suggesting that the two should be treated as separate species; this is supported by molecular analysis, which indicates that *moheliensis* is not the sister-taxon of *parvirostris*. The present treatment of the two as conspecific is considered provisional, pending a full review.

Another taxon with an unstable taxonomic history, albeit one of where it should best be placed rather than whether it existed at all, is the Black-collared Bulbul (*Neolestes torquatus*). On the basis of its distinctive plumage pattern and coloration, it has also been associated with the malaconotid bush-shrikes and, more recently, with the helmet-shrikes (Prionopidae). Whether the preferred option has been bulbul or "shrike", however, the various authorities have usually regarded their choice as tentative, with D. A. Bannerman going so far as to hedge his bets and call it "Black-collared Bulbul-Shrike". Recent work by R. J. Dowsett and colleagues, covering biology, anatomy and DNA, has shown that *Neolestes* is best kept within the bulbuls, where it represents a deep branch of the pycnonotid clade, and may be either the sister-group of the family as a whole or a member of a larger group of which the bulbuls are only one part. Biologically, aspects of its breeding and vocal behaviour, diet and juvenile plumage all argue firmly against its being a "shrike", and suggest that



The six Asian species once combined with Criniger *revert to the genus erected for them by Eugene Oates in 1889:* Alophoixus. *Four of the six, including the* ***Ochraceous Bulbul****, make up a relatively homogenous subgroup of large bulbuls, with permanently erected crests, and throat feathers almost always puffed out, as if brushed the wrong way. This quartet, the "true"* Alophoixus *bulbuls, are generally common in humid forests across southern Asia, from north India to Vietnam and Bali, where they are noisy and conspicuous components of the middle-storey avifauna.*

[*Alophoixus ochraceus cabanisi*, Khao Pra-Bang Kram Wildlife Sanctuary, Krabi, Thailand. Photo: Suppalak Klabdee]



In many bulbul species elongated filoplumes project inconspicuously from the nape, a feature taken to extremes in the ***Hairy-backed Bulbul****, in which these slender filaments grow up to 50 mm long, making them visible under optimum conditions (such as in this photo). Their function, if any, is unknown, but they might be used in courtship displays. The Hairy-backed Bulbul is aberrant in other ways, and occupies a monotypic genus as a result. It is a dainty species that commonly attends mixed-species flocks in the understorey of evergreen forest.*

[*Tricholestes criniger viridis*, Bentuang-Karimum National Park, Kalimantan, Borneo. Photo: Doug Wechsler/ VIREO]

it is, more probably, a bulbul. This is mirrored anatomically, with the morphology of the syrinx, the skull, the humerus and the carpometatarsus all being counter to a shrike affiliation while not being incompatible with the Pycnonotidae. *Neolestes*, however, lacks the nasal ossification (see Morphological Aspects) characteristic of the family, and this absence is thought to be primitive. The Black-collared Bulbul is therefore, as suggested by Dowsett and co-workers, best considered *incertae sedis* within the Pycnonotidae.

The systematic position of the genus *Nicator* has been open to question ever since J. P. Chapin suggested, in the 1920s, that its affinities might not lie with the shrikes (Laniidae). Since it was first described, in 1870, the genus had traditionally been classified with the shrike family Laniidae, formerly considered to include the malaconotid and prionopid species, among several others, on the basis of similarities in coloration and bill morphology. Chapin pointed out that many of its characteristics were more indicative of the bulbuls. He discussed the ways in which *Nicator* both resembled and differed from bush-shrikes of the genus *Malaconotus*, to which it had traditionally been allied, and compared it also with *Bleda*, the bulbul genus which, he initially thought, it most closely resembled. In the end, however, he did not advocate a change in the status quo, and it was not until Delacour's 1943 revision of the family that *Nicator* was placed in the Pycnonotidae for the first time. Delacour derived *Nicator* from *Bleda*, which he in turn derived from *Phyllastrephus*. Chapin subsequently included *Nicator* with the bulbuls in his 1953 treatise, although he did consider that it was not closely allied to *Bleda*. Thereafter, *Nicator* became increasingly treated as a bulbul in systematic texts and regional avifaunas.

More recently, however, the pendulum has started to swing back in favour of treating *Nicator* as a bush-shrike. This follows the studies of S. Olson, who reported that *Nicator* lacks the diagnostic pattern of ossification in the nostril found in almost all bulbuls, and argued for the return of *Nicator* to the Malaconotidae. As further evidence, it was pointed out that *Nicator* lacks the filoplumes in the nape characteristic of most pycnonotids (see Morphological Aspects) and absent also in bush-shrikes, but that it possesses a patch of bristly feathers between the eye and the gape, lacking in other bulbuls but present in *Malaconotus*. Some similarities in foraging technique between *Nicator* and malaconotid shrikes have also been noted.

There are, however, at least as many differences between *Nicator* and the bush-shrikes as there are similarities, and these are outnumbered by the similarities between *Nicator* and the bulbuls. These include the plumage of *Nicator*, which is soft and abundant like that of the bulbuls, and not hard and dense as it is in the bush-shrikes, while *Nicator* shares with the bulbuls the peculiarity of a gap in the feather tract of the back of the neck (see Morphological Aspects), a feature not present in bush-shrikes; in addition, *Nicator* has eyerings and areas of bare periorbital skin, characters shown by some bulbuls but not by bush-shrikes, it is strongly sexually dimorphic in size, as are many bulbuls but not bush-shrikes, and its vocalizations differ strikingly from those of bush-shrikes but less so from those of bulbuls. Further, analyses of feather proteins and early DNA–DNA hybridization studies both place *Nicator* within the



The genus Iole *contains three nondescript South-east Asian species, typified by the* ***Buff-vented Bulbul****. Anonymously dressed, and lacking a notable song, it is often overlooked or misidentified in the field, until its distinctive call is recognized. It is even commonly confused with sympatric* Malacopteron *babblers, which look vaguely similar. The taxonomic history of this group is rife with shifting treatments and taxa wrongly allocated. To add further confusion, when* Iole *is subsumed in* Hypsipetes*, the name* olivacea *is preoccupied, and* charlottae *takes priority as this species' name.*

[*Iole olivacea charlottae*, Crocker Range National Park, Sabah, Borneo. Photo: Doug Wechsler/ VIREO]



The most common and widespread member of the genus Ixos *is the* ***Mountain Bulbul****, its nine races occurring from the Nepalese Himalaya to the Da Lat plateau of Vietnam. It varies substantially in colour and pattern across this range, but most forms have a beautiful rich pinkish or yellowish bloom to the plumage, which is always soft and dense. They are attractive and confident creatures, elegantly elongated, with relatively long and slender bills, and large square-ended tails. In conduct, however, they have something of the brashness of most bulbuls, and are often found squabbling over berries or roving in small garrulous flocks.*

[*Ixos mcclellandii holtii*, Wuyi Shan, Jiangxi, China. Photo: Forrest Fong]

Pycnonotidae, and several other parameters suggest the same treatment. In truth, however, *Nicator* is unique in a number of features, including its nest structure and its possession of preorbital, as opposed to rictal, bristles, as well as the feathering of the lores, which, in contrast to the bush-shrikes, forms stiff, tufted, differently coloured pads in front of each eye. Arguably, it is also vocally distinct.

In view of this continuing uncertainty and debate, it is perhaps not surprising that the most recent DNA studies have indicated that *Nicator* is not closely related to either the bulbuls or the bush-shrikes, but that it appears to merit family status in its own right. For the time being, however, *Nicator* is retained within Pycnonotidae, pending the publication of further studies.



The islands of Wallacea are populated by a single, morphologically variable bulbul superspecies, often dumped in Hypsipetes *but apparently meriting its own genus. The variation in morphology and voice of different island populations implies that more than one species is involved, but the pattern of variation is confusing. On the basis of a dramatic discontinuity in vocal characters the southern races, from Buru, Seram and Ambon, can be split off as the Southern Golden Bulbul* (Thapsinillas affinis)*, leaving all other forms as the* ***Northern Golden Bulbul****. A detailed complex-wide review of genetics and voice is needed to determine whether further subdivision is necessary.*

[*Thapsinillas longirostris chloris*, Halmahera, Indonesia. Photo: Morten Strange]

Comparative analyses of mitochondrial DNA appear recently to have settled one long-standing taxonomic conundrum, by showing that the Malagasy species placed in the genus *Phyllastrephus* by Delacour, in his 1943 revision of the family, unequivocally do not belong either there or, indeed, within the Pycnonotidae itself. In fact, these studies, particularly those undertaken by A. Cibois and colleagues, have revealed that all these species, together with a number of other endemic genera, including *Oxylabes*, *Thamnornis*, *Hartertula*, *Cryptosylvicola* and *Crossleyia*, form part of a single separate radiation of Malagasy songbirds and do not belong, as had previously been thought, variously with the bulbuls, the babblers and the warblers.

Delacour originally placed five Malagasy species in *Phyllastrephus*, and this treatment was adopted by many subsequent authors; a sixth species, *Phyllastrephus apperti*, was added, following its initial description, in 1972. One of those which Delacour transferred was, in response to studies made in the 1970s, removed to the Timaliidae and reverted to the name by which it had previously been known, *Crossleyia xanthophrys*. Subsequent morphological study of the remaining five argued for their removal from the Pycnonotidae; these species were found to lack any trace of the nasal ossification indicative of the family, and they differ osteologically in other ways, too. The more recent molecular evidence has substantiated this and thereby removed the problem of having to explain how a sedentary forest passerine such as *Phyllastrephus* could occur in both Africa and Madagascar. These studies have further demonstrated that the Malagasy "*Phyllastrephus*" are themselves polyphyletic, such that *madgascariensis* should be placed on its own in the genus, *Bernieria*, with the four others, namely *zosterops*, *cinereiceps*, *apperti* and, by inference since no material was available for study, *tenebrosus*, forming a monophyletic group. These four revert to the genus *Xanthomixis*, first erected by R. B. Sharpe in 1881, but long lost in synonymy.

As mentioned at the beginning of this section, these five species are included in the Pycnonotidae merely for reasons of convenience, since the full implications for taxonomy and classification of the discovery of this single separate Malagasy radiation have yet to be realized.

Morphological Aspects

Bulbuls are, typically, slender-bodied, medium-sized passerines with a relatively short neck, wide, rounded wings and a longish

tail. Their legs and feet are usually quite weak, small and short, while the bill, with the conspicuous exception of the two *Spizixos* finchbills, which have a short and stubby bill, is generally of medium length, sometimes shorter, and is slender to moderately thick, the upper mandible downcurved towards the tip, sometimes with serrations and often notched. The operculate nostrils possess a feature common to all "true" pycnonotids except the Black-collared Bulbul, and one which helps to define the family. This is the presence of a thin sheet of bone, or ossified connective tissue, which covers the posterior portion of the nostril. This character is absent in the genera *Nicator*, *Bernieria* and *Xanthomixis* (see Systematics).

In size, bulbuls vary from the dainty, warbler-like Tiny Greenbul (*Phyllastrephus debilis*), 13 cm long, to the heavy-bodied Straw-headed Bulbul, which, at 29 cm, is double the size of many of its co-familials. The sexes of all pycnonotids are generally alike, although females tend to be smaller than males. In the genera *Pycnonotus*, *Hypsipetes* and *Neolestes* these size differences may be minor, at best, while in others they are considerable. In some *Phyllastrephus* greenbuls the differences are sufficiently great that the two sexes have been described as functioning as separate "ecological species", while the males of the Western Nicator (*Nicator chloris*) and the White-throated Nicator (*Nicator gularis*) may be 35–50% heavier than the females. Immatures are unspotted and resemble the adults, but are generally duller in coloration. Young bulbuls, in common with many passerines, tend to have relatively narrow and less paddle-shaped rectrices, with distinctly pointed tips at the shaft.

The plumage of bulbuls is often long, soft and fluffy, particularly on the lower back and rump. Indeed, the name *Pycnonotus* means "dense-backed" and is thought to be a reference to the feathering in this region. By contrast, the cervical region of the spinal tract is usually bare of all except downy feathers, and this is sometimes apparent in the field when the neck is stretched. The skin is typically rather thin; when handled, many pycnonotids will shed feathers readily, although this appears to be more true of the forest species than of the open-country ones. The crown feathers of some species are elongated to form a conspicuous permanent crest, while in others they are partially erectile and are used in display, appearing rather long and unkempt at other times. Similarly, the throat feathers of *Criniger* and *Alophoixus* are also erectile and may be puffed out as a contact signal or in display.

Many bulbuls have bristles, or filoplumes, of unknown function, growing from the nape. In some species these are short and hard to detect, whereas in others they are long, up to 50 mm in the case of the Hairy-backed Bulbul (*Tricholestes criniger*), and fairly conspicuous and can sometimes be seen in the field. These nuchal filoplumes have sometimes been considered a family character, but they are absent in a few species, such as the Black-collared Bulbul, in addition to which they are not restricted to the Pycnonotidae.

Bulbuls possess ten primaries, with P10 often short and no more than about half the length of P9. The tail consists of twelve rectrices and may be square-ended, rounded or, more rarely, graduated. Although some species are strikingly coloured, with bright yellows contrasting with black, these are the exceptions and the plumage coloration comprises, for the most part, sombre combinations of dull greens, browns, greys and yellows, each of which is often prefixed by the word "olive". Contrast may be provided by bright yellow or white, variously on the throat, the tail tips or the outer tail feathers or as spotting on the wings. Some species have contrastingly coloured vent or rump feathering. For example, the back and rump feathers of the Black-headed, Andaman, Grey-headed, Yellow-wattled (*Pycnonotus urostictus*) and Puff-backed Bulbuls (*Pycnonotus eutilotus*) have striking pale tips and black bases. These feathers are used in signalling displays (see Breeding), which involve the raising and puffing-out of the rump feathers, at which time they appear strikingly barred. When the bird is at rest, the dark bases are invisible and the rump and lower back look almost uniform in colour. To what extent this distinctive morphological feature contains useful phylogenetic information is unknown, but it seems likely that the "bar-backed" species are more closely related to each other than the current sequence implies. At the moment they are separated by a broad swathe of plain-backed congeners, an improbable discontinuity that needs to be addressed when the genus *Pycnonotus* is reviewed and subdivided.

Most bulbuls appear to undergo a complete body moult after breeding, although there may be overlap in the timing of the two events. Some species begin the moult before they have completed breeding, while the timing of moult of some others, such as the



*The **Brown-eared Bulbul** is one of the most abundant and familiar birds throughout much of Japan, where it thrives in a wide variety of habitats including suburban gardens and even city centres. Long embraced by an inclusive* Hypsipetes, *it is now considered divergent enough for isolation in a monotypic genus. In evolutionary terms, it is probably closest to the "black bulbuls", in other words to the core of species to which an exclusive* Hypsipetes *contracts. Like several "black bulbuls", it is large and long-winged, capable of sustained flight, and also highly gregarious in the non-breeding season.*

[*Microscelis amaurotis amaurotis*, Yamagata, Japan. Photo: Hirozo Maki]

The genus Hemixos *is sometimes viewed as one variable species. However, its constituent taxa can be grouped into three distinct subgroups, each of which is vocally and morphologically distinct, suggesting that it is best viewed as a superspecies made up of allospecies. One of these, the* ***Chestnut Bulbul****, differs chiefly in its rich rufous upperparts, but this race is further distinguished by the lack of green or yellow tones in the plumage. In general structure, all* Hemixos *bulbuls are similar, with slim bills, erectile crests and pronounced rictal bristles, these last perhaps being an adaptation for flycatching.*

[*Hemixos castanonotus canipennis*, Tai Po Kau spur, Hong Kong. Photo: Martin Hale]



Cape Bulbul, varies individually and no correlation between moult and breeding season is found. The majority of species moult the flight-feathers symmetrically in regular descendant fashion, with usually two but sometimes three feathers in simultaneous growth. In Sarawak, M. P. L. Fogden found that the moult of the Yellow-vented Bulbul (*Pycnonotus goiavier*) lasted roughly 17 weeks, as did that of the Olive-winged (*Pycnonotus plumosus*), Asian Red-eyed and Spectacled Bulbuls (*Pycnonotus erythrophthalmos*), whereas he recorded 20 weeks for the Puff-backed Bulbul, 21 weeks for the Grey-cheeked Bulbul (*Alophoixus bres*) and 23 weeks for the Yellow-bellied Bulbul. Studies by D. B. Hanmer in Malawi and Mozambique revealed similar durations for African species, with primary moult taking 12–16 weeks in the case of the Sombre Greenbul and the Terrestrial Brownbul (*Phyllastrephus terrestris*) and 16–20 weeks in the Yellow-bellied Greenbul (*Chlorocichla flaviventris*), while in Kakamega, in Kenya, C. F. Mann reported 20 weeks for Shelley's Greenbul and the Plain Greenbul, 15–27 weeks for Cabanis's Greenbul and 13–23 weeks for the Red-tailed Bristlebill. For some species, however, Mann found more extended moult durations, including 30 weeks for the Grey Greenbul, 45 weeks for the Little Greenbul and 44–48 weeks for the Yellow-whiskered Greenbul. There appears also to be significant regional variation; thus, while the Common Bulbul takes 4–5 months to moult its primary feathers in Malawi and Mozambique, it can take 5–9 months in west Kenya. In general, however, the timing and duration of moult may exhibit considerable annual variation, indicating that environmental conditions influence moult strategy.

Head and eye ornamentation and colour appear to be important in bulbul recognition and/or display, but this aspect has been little studied. Many pycnonotids have conspicuously coloured eyes, eyerings, eye wattles, unfeathered periorbital skin or loral spots or streaks. Thus, adults of numerous species, in both Asia and Africa, have bright irides of pearly blue, orange, bright red, yellow or white. In the case of some species, eye colour varies in different parts of the range. For example, adult Cream-vented Bulbuls (*Pycnonotus simplex*) in Peninsular Malaysia have creamy-white eyes, as do some of those in Borneo, but others in Borneo have red eyes; immatures have dull-coloured eyes. Similarly, the Stripe-cheeked Greenbul of the subspecies *striifacies*, in the northern part of the Eastern Arc Mountains of Tanzania, has pale bluish-grey, reddish-brown or, rarely, yellow eyes, whereas those of the race *olivaceiceps* of the southern Eastern Arc Mountains of Tanzania, Malawi and north-west Mozambique are yellow in the southern part of the range and chestnut in the north; the nominate race, from the highlands of south-east Malawi, north-central Mozambique and Zimbabwe, has dull pale grey or brown eyes, but these are offset by a contrasting broken white eyering, conspicuous on the upper eyelid, which the other two races do not have. There are also reports that the eye colour of *olivaceiceps* varies seasonally, changing from orange to pale yellow at the onset of the breeding season, but this has been disputed.

Pycnonotids with dull-coloured eyes, such as the *Andropadus* and *Phyllastrephus* greenbuls and brownbuls, and several members of the genus *Pycnonotus*, tend to have contrastingly coloured eyerings. Two of the four *Bleda* bristlebills have an area of conspicuous bare bluish skin before and behind their reddish-brown eyes, while in the other two species these unfeathered areas are largely absent or reduced. Instead, one race of the third species, also with reddish-brown eyes, has bright yellow loral spots, and the second subspecies has dull yellow loral spots and bright yellow eyes, while the fourth bristlebill species has dark eyes and grey loral spots. These loral spots may be either largely concealed or prominently displayed, according to mood. When displayed, the bright yellow lores of the nominate race of the Lesser Bristlebill (*Bleda notatus*) stand out like headlamps in the gloom of the forest floor when the bird is viewed from the front.

Contrasting facial ornamentation must be of considerable significance, given the number of bulbul species that possess such a feature. One example is the Yellow-eared Bulbul (*Pycnonotus penicillatus*), a distinctive Sri Lankan species with a blackish face, adorned with contrasting bristly yellow ear-tufts and cheek-spots, and a whitish postorbital dot. It also has a distinctive white streak, beginning at the base of the bill and forming upright plumes (or 'horns') in front of the eye. Bulbuls of many species probably use this type of ornamentation in contact, sexual or territorial display, perhaps as signals of specific identity, individual status or quality, but much remains to be learnt about their function. Indeed, appreciation of the full range of facial characters of many bulbuls is relatively recent, and probably remains incomplete. Details of eye colour, eyerings and similar characters are, of course, lost on skins, as a consequence of which the group has, in the past, been poorly served by illustrations based on museum material.

The genus Hypsipetes *is here treated as a complex of seven species (the "black bulbuls"), all of which are conspicuous birds, with long tails, long wings, and red or orange bills. Asiatic forms have traditionally been lumped together as one polytypic species, but the evidence in favour of species status for the isolated taxa in south India and Sri Lanka seems compelling. Aside from their diagnostic unforked tails, both races of the* ***Square-tailed Black Bulbul*** *sound harsher and less nasal than their Himalayan and Chinese relatives. In fact, the voice of Sri Lankan* humii *differs markedly from mainland* ganeesa*, and two species may be involved.*

[*Hypsipetes ganeesa humii*, Sri Lanka. Photo: Greg & Yvonne Dean]





The genus Hypsipetes *contains the only group of true bulbuls to have radiated in the Malagasy realm. Without doubt, the long wings and migratory nature of Asiatic congeners predisposed them to the colonization of oceanic islands. Ancestral forms reached Reunion, Mauritius, Aldabra, Madagascar, the Seychelles and the Comoros. They may have reached continental Africa, but here they would have been out-competed by ecologically similar taxa. The isolated Malagasy populations diverged over time, and are now best viewed as a complex of five species, the commonest and most widespread of which is the* ***Madagascar Black Bulbul****.*

[*Hypsipetes madagascariensis madagascariensis*, Mayotte (Maore), Comoros. Photo: Roland Seitre]

Rictal bristles are prominent in the more insectivorous species. They are particularly long in the Hairy-backed Bulbul and strong in the bristlebills; in the Red-tailed Bristlebill, the longest bristle may be equal in length to the bill. Those of the Asian genus *Hemixos*, which indulge in flycatching more than do most bulbuls (see Food and Feeding), are also well developed. True rictal bristles are poorly developed in the three nicators, and are replaced functionally by preorbital bristles, a feature distinctive of the genus. These are disposed around the leading edge of the eye, in an arc running from behind the supraloral streak to above the rear of the gape. Their shape and orientation, which vary depending on where in relation to the eye they originate, may represent modifications to protect the eyes from possible damage directed downwards and sideways from above the bill, a likely threat to a bird that specializes in feeding on large orthopterans and mantids.

The Black-headed Bulbul manifests some variation in the yellowness of the plumage, which may sometimes have a greenish wash throughout. In addition, it occurs as a rare grey morph, which has a variably slaty neck, breast and belly (see Systematics). This morph, which has been described as a separate species on more than one occasion, is (or was) regularly found in north-east India, but it is very rare in South-east Asia and in the three main islands of the Greater Sundas. Interestingly, it seems to arise much more commonly on small islands. More than half of the individuals on Bawean are grey, as were all those seen on Maratua, off east Borneo. No reason for this distribution of schizochroism has been proposed. In some areas, such as east Thailand, a further morph occurs in which dull orange or yellow-green replaces the yellow.

Another factor, and one which has complicated bulbul taxonomy in Asia (see Systematics), is the tendency for the plumage to fade dramatically with wear and time after death. The comparison of old museum specimens with new material has resulted in the publication of a number of erroneous subspecific descriptions.

At least one instance of apparent melanism among pycnonotids is known. In 1972, a new greenbul, "*Andropadus hallae*", was described by A. Prigogine from a single specimen collected in eastern DRCongo. It has since been concluded that this is a melanistic specimen of the Little Greenbul, which it resembles closely except for being significantly darker overall, with little or no yellow below, and with black, not yellowish-brown, legs and feet. No other example has ever been recorded, despite intensive collecting in the area both before and since that time. It is possible that Sassi's Olive Greenbul, from the same area of DRCongo, may also prove to be a melanistic form (see Systematics).

As a final point of interest, it is perhaps worth making mention of a peculiar morphological deformity displayed by a Brown-eared Bulbul in southern Japan. An individual of this species, captured in the Bonin Islands, had three claws on the first toe of its right foot and two first toes on its left foot. The cause of this physical deformity was not clear.

Habitat

Bulbuls are birds predominantly of the Old World tropics, where they are found in Asia, Africa, Madagascar and the island groups of the western Indian Ocean. A few species have penetrated temperate areas of South-east Asia, the Middle East, southern Turkey and north Africa, as well as the Cape region of South Africa. They are, for the most part, arboreal birds, living in forest, woodland, scrub and thickets.

Relatively few Asian bulbuls live within primary forest, the majority being inhabitants of clearings, edge habitats and scrub. Those that do are largely canopy species, all of which often descend lower at forest edges and in clearings. Only a few, such as the Hairy-backed Bulbul and the *Alophoixus* species, are birds of the middle storey and the understorey.

By contrast, pycnonotids in Africa are quintessential birds of the lowland Guineo-Congolian forest region, both of edge habitats and of the forest interior, where they occur at all levels, from the ground up to the canopy. In areas where there is a variety of habitats ranging from secondary regrowth to relatively undisturbed forest, it is by no means unusual to find more than 20 species occurring in close proximity to each other. They are also among the commonest forest species; the Yellow-whiskered and Little Greenbuls, along with the Olive Sunbird (*Cyanomitra olivacea*), regularly come out in the top five most frequently caught species in netting studies in lowland forest areas. Pycnonotids are also a conspicuous element of the avifauna of montane forests in Africa, and a few species range to over 3000 m in montane shrubland, bracken-briar and bamboo. Similarly, bulbuls are numerous in the forests of the East African coast and its associated woodland and thicket habitats. With the exception of the genus *Pycnonotus*, they have penetrated little into more arid areas.

Only a few members of the family are known to have specialized habitat requirements. In South-east Asia, for example, the Straw-headed Bulbul is virtually restricted to waterside woodland, especially along rivers in tall forest, but not occurring in



The head-pattern of the ***Black-collared Bulbul*** *differs strikingly from all other pycnonotids, prompting some reviewers to consider it a bush-shrike (Malaconotidae) or a helmet-shrike (Prionopidae). However, details of its anatomy, voice, behaviour, diet and juvenile plumage all argue firmly against its being a "shrike", as do DNA data. The best policy seems to be to retain* Neolestes *as* incertae sedis *within the bulbuls, where it represents a deep branch of the pycnonotid clade.*

[*Neolestes torquatus*, Mwinilunga, north-west Zambia. Photo: Jon Hornbuckle]

the forest itself. The Leaf-love is an African species with similar preferences: it inhabits forest-fringed rivers, gallery forest and thicket, penetrating forest only where there are areas of *Raphia* swamp. The Swamp Palm Bulbul, found in the same parts of western and central Africa, is even more tied to swampy areas with *Raphia* and, to a lesser extent, *Elaeis* palms.

Since a large number of species of bulbul are frugivorous and tend to favour the small-fruited tree species common in forest regrowth, many do well in areas of degraded forest. Those inhabiting the forest interior, on the other hand, many of which are insectivores, cope less well in secondary habitats. Again, however, it is the *Pycnonotus* bulbuls that profit most from anthropogenic habitats. As a result of irrigated agriculture and human settlement, which have resulted in the growth of shrubs and trees, members of this genus have colonized many subdesert and desert areas that were previously unsuitable for them.

General Habits

Bulbuls vary greatly in their conspicuousness. Some, including many of the *Pycnonotus* and *Hypsipetes* species, are familiar and conspicuous birds, bold and confiding, and often perching on the tops of bushes, or on fences, wires and similar exposed sites, where they attract attention through their jaunty movements, their loud and persistent calls and their restless behaviour, flying noisily from bush to bush. Others, however, particularly those of African forests and thickets, are much more skulking, often betraying their presence only through their vocalizations. Some Asian pycnonotids are similar in keeping to forest undergrowth, although almost all are less retiring than their African cousins. Perhaps the least conspicuous Asian taxon is Finsch's Bulbul, a dull-coloured bird which lives in the dense canopy of evergreen forest and is rarely heard to call.

Most members of the family confine themselves to relatively short flights. When crossing large clearings, their flight often appears loose and jerky, the wingbeats coming in bursts and the tail switching up and down, especially just before landing. Others are stronger fliers, swift and direct; the action of the Common Bulbul has been described as thrush-like, while the flight of various *Hypsipetes* species, and the Brown-eared Bulbul, is often high, powerful and sustained, with fairly marked undulation. Some races of the Himalayan Black Bulbul are migratory (see Movements) and are thus particularly strong fliers; they fly with a rapid, easy action and travel long distances. J. K. Stanford stated of these birds in Myanmar that "they are the only bulbuls which fly several miles to a feeding place after the manner of Paroquets [parakeets (Psittacidae)]".

A number of pycnonotids which live in small groups, such as the Yellow-throated Greenbul and the Swamp Palm Bulbul, often move in follow-my-leader fashion, in which party-members move in succession, one landing on a perch just vacated by another. Several of the *Phyllastrephus* species are similar in behaviour, and members of parties often appear reluctant to cross a path or other open area and do so only in slow succession one after another, each one pausing before following the one in front. In Asia, *Alophoixus* bulbuls also often follow each other in single file when crossing a clearing, road or river. They, however, appear much more confident, and have often been likened to laughingthrushes because of their habit of roving noisily through the middle storey of forest, creeping and clambering among bamboo, vine tangles and the like.

When breeding, many bulbuls are territorial, although the Yellow-whiskered Greenbul is an exception in those parts of its range where it shows lekking behaviour (see Breeding). The extent to which bulbuls are territorial at other times, however, is not very clear. Some species certainly are. The Simple Greenbul (*Chlorocichla simplex*), for example, vigorously defends its territory of 1–2 ha throughout the year in Gabon. For others, however, the situation is less clear-cut. A good number of pycnonotids, both in Asia and in Africa, seem to occupy a fixed space all year. This is true of *Tricholestes* and *Alophoixus* bulbuls in South-east Asia, as demonstrated, for example, by the repeated recapture within and between breeding seasons of Hairy-backed Bulbuls



The plumage of bulbuls is usually ample, long and soft, particularly on the lower back and rump. Indeed, the name Pycnonotus *itself, meaning "dense-backed", is thought to refer to feathering in this region. Many bulbuls raise or spread these feathers as part of courtship displays, or during bouts of sunbathing, as illustrated by this* **Red-whiskered Bulbul**. *This species, an offshoot of the* Pycnonotus *clade, and best-known occupant of the subgenus* Otocompsa, *is striking in pattern, jauntily crested and generally rather slim and erect in stance. As with other bulbuls, the puffing out of its dense body plumage can produce a much more rotund impression.*

[*Pycnonotus jocosus*, Tai Po Kau, Hong Kong. Photo: Martin Hale]

at Pasoh, in Peninsular Malaysia. Studies in Gabon have revealed the same thing for *Criniger*, *Bleda* and *Phyllastrephus* species, as illustrated by the ant-following Red-tailed Bristlebill. This species appears to be territorial throughout the year, but the territories overlap; in areas where ants are common, individuals may have home ranges rather than defended territories. More than one pair or family group may be found around ant swarms, where a dominance hierarchy seems to be established, with dominance at any one time determined by the individual or pair the home range of which is occupied by the ants; owners keep the best vantage points for themselves. Ringed individuals did not follow ants for more than 200 m. In areas where or at seasons when there are few ant swarms, pycnonotids may be more strictly territorial. The Icterine Greenbul is another species which exhibited marked site-fidelity in Gabon; of 64 individuals ringed, 36 were recaptured at least once in the same place, with one being recaught seven times in 66 months and another on twelve occasions in 90 months. Fidelity is shown not only to location but also to partner; both members of a pair were recaught together in the same mist-net after 6, 7 and 61 months. For many of these species, however, typical defensive territorial behaviour, involving contests and vocal activity, has not been observed. Whether these "fixed spaces" and their resources are defended, and so merit the term "territory", remains to be discovered.

Although territorial during the breeding season, some members of the family certainly are not so at other times, and will flock together to varying degrees. Some species, such as the Himalayan Black Bulbul and the Red-vented Bulbul, may form flocks of over 100 individuals in the non-breeding season or when on passage. In Hong Kong, Red-whiskered Bulbuls have also been recorded in non-breeding flocks of up to 200, sometimes mixed with Red-vented Bulbuls, although groups of 20–30 are more usual. The Light-vented Bulbul (*Pycnonotus sinensis*) can be even more gregarious; one gathering of 1000 individuals was recorded in agricultural fields around Hong Kong in December, and three migratory flocks, totalling 2500 birds, were seen in flight over that city in April. White-eyed Bulbuls will also gather together at locally abundant food sources, with flocks of 25–40 recorded in Jordan, and of several hundreds, even thousands, in Israel, at the end of the breeding season, when up to 83% of such flocks comprise first-year birds. Similarly, Common Bulbuls collect in large, loose noisy foraging parties of up to 100 individuals

during the non-breeding season, as do Cape Bulbuls, in the latter case typically of 5–9 birds, although up to 40 may gather at fruiting trees. The Sombre Greenbul is also reported as forming large flocks in the non-breeding season.

Many members of the Pycnonotidae live in small family groups, but the Spotted Greenbul (*Ixonotus guttatus*) is probably the most constantly gregarious of all bulbuls, occurring in monospecific flocks of 5–50 individuals in all months of the year. In general, however, large single-species flocks of bulbuls are exceptional, and much more frequent is the habit of associating with other species in mixed flocks at fruiting trees and at other food sources. This behaviour is widespread in both Africa and Asia. In the Sundaic region of Asia, for example, several species of *Pycnonotus*, such as the Black-and-white Bulbul, the Puff-backed Bulbul, the Asian Red-eyed Bulbul and the Spectacled Bulbul, will gather at sources of fruit. Here, a fruiting shrub, or trees covered in masses of figs (*Ficus*), may be visited in a day by hundreds of birds, the majority of which are often bulbuls, augmented by smaller numbers of flowerpeckers (Dicaeidae), leafbirds, barbets (Capitonidae), orioles (Oriolidae) and others. Similar gatherings are a familiar sight in African forests, where up to six species of *Andropadus* greenbul, Golden Greenbuls (*Calyptocichla serina*), Honeyguide Greenbuls (*Baeopogon indicator*), Spotted Greenbuls, Common Bulbuls and others may come together in large numbers over the course of a morning in order to gorge on ripe figs, along with hornbills (Bucerotidae), turacos (Musophagidae), pigeons (Columbidae), barbets and tinkerbirds, starlings (Sturnidae), malimbes (*Malimbus*) and other frugivores. Much as these gatherings are common occurrences, they are not true mixed-species flocks. They are temporary aggregations at concentrated food supplies, the birds moving independently when they leave the food source.

More permanent are the groupings of understorey species which roam humid forests, mostly in search of insects. In lowland forests of Africa, bulbuls may form the majority in these associations, with the Icterine Greenbul one of the most regular elements. In a study of 228 multi-species flocks in Gabon, by A. Brosset, this species was positively recorded in 156 flocks and may well have occurred in more, while the Red-tailed Greenbul was recorded in 104 and the Lesser Bristlebill in 72. In these flocks, bulbuls never fulfilled the role of "leader" but were always followers, and generally hunted insects disturbed by the passage of the leader, often a mammal such as a duiker (*Cephalophus*).

In Asia, too, Hairy-backed Bulbuls are regular followers in these groupings, as are Yellow-bellied Bulbuls, searching for insects flushed by the foraging party, and harvesting small berry-bearing shrubs and vines as they go. These flocks tend not to be centred around bulbuls, but around babblers, with various species of *Malacoptilon*, *Stachyris* and *Trichostoma* forming the core. The middle storey is frequented by noisy groups of other *Alophoixus* bulbuls, sometimes joined by *Malacoptilon* babblers and *Garrulax* laughingthrushes in roving mixed-species aggregations.

H. E. McClure studied mixed-species flocking by forest birds at Gombak, in Peninsular Malaysia, and came up with some conclusions of interest regarding bulbul behaviour. A total of 89 bird species was counted in 74 mixed-species flocks. Nine species were in more than 25% of flocks and were thought therefore to be regular flock-members; these consisted of leafbirds, minivets (*Pericrocotus*), orioles, babblers, flycatchers (Muscicapidae), drongos (*Dicrurus*) and warblers, but none of the nine was a bulbul. Bulbuls as a whole were found in 38 of 74 flocks at one site and in 34 of 80 flocks at another site, which equates to a presence of, respectively, 51% and 42%. Given the general abundance of bulbuls in Malaysia, this is a fairly clear representation of their general non-attendance of mixed-species flocks, as opposed to gatherings at fruiting trees, in almost 100% of which they are present. Similarly, J. K. Stanford watched mixed-species flocks in evergreen forest in north Myanmar and counted twelve genera of birds that were common attendees of these flocks, none of which was a bulbul. He did, however, mention that bulbuls gathered at flowering rhododendrons (*Rhododendron*) and fruiting trees, converging on these from miles around.

In McClure's Malaysian study, the most frequent attendee in terms of proportion of individuals observed was the Hairy-backed Bulbul: of 41 individuals encountered, as many as 28, or 68%, were in flocks. It is of note that this is one of the most insectivorous of pycnonotids, which probably helps to explain its attendance of mixed-species flocks of insectivores. Other species were usually found away from flocks, as instanced by the fact that only 21% of Asian Red-eyed Bulbuls found were in flocks, the corresponding figure for Grey-cheeked Bulbuls being 37% and for Streaked Bulbuls just 7%. A similar study at a slightly higher



Bulbuls spend a good deal of their time preening, in order to maintain the quality of their plumage. Flocking species tend to synchronize their bouts of comfort behaviour, often perching together and preening through the middle of the day. The same type of synchronization applies to less gregarious species, such as the ***Orange-spotted Bulbul****, pairs of which often preen in close proximity. Be that as it may, reciprocal preening, or allopreening, has never been reported in any member of the family.*

[*Pycnonotus bimaculatus*. Photo: Brian J. Coates]



Most bulbuls are, to a greater or lesser degree, social birds. Pair members spend much time consorting, often with little regard for personal space, and many species join flocks. The ***White-eyed Bulbul*** *is monogamous in the breeding season, but scores of individuals gather at prime sites during winter, while at the end of the breeding season flocks of thousands have been recorded, mostly comprising first-year birds. The bulbuls known to congregate in large single-species associations are outnumbered by those that join mixed-species flocks, either of foraging insectivores or of frugivores concentrated at locally abundant food supplies.*

[*Pycnonotus xanthopygos*, Israel. Photo: Duncan Usher/ Ardea]

altitude in the same watershed revealed that Scaly-breasted Bulbuls moved through the canopy in loosely knit but organized parties, which often came into contact with the permanent assemblages of insectivores. Of 80 mixed flocks watched, these bulbuls were part of 20, but they were only a temporary ingredient, tending to converge when fruit trees were in the vicinity and moving off again later. The author assumed that the bulbuls were eating only fruit, and may not have noticed that they gained some advantage by temporarily foraging on insects.

During the breeding season, many bulbuls are very aggressive (see Breeding). They can be equally so when feeding together with other species. Those which attend driver ant swarms (see Food and Feeding) often demonstrate intraspecific and interspecific aggression as a means of establishing dominance hierarchies. In Africa, for example, the Grey-headed Bristlebill interacts aggressively with the Red-tailed Bristlebill, the Little Greenbul, the Brown-chested (*Pseudalethe poliocephala*) and White-tailed Alethes (*Alethe diademata*) and the White-tailed Antthrush (*Neocossyphus poensis*). These noisy disputes involve loud singing and the spreading of the tail feathers, displaying their yellow tips, and chasing and violent fights may ensue.

As a further manifestation of their aggressive behaviour, bulbuls are also enthusiastic mobbers of predators, such as hawks (Accipitridae), owls (Strigidae), crows (Corvidae), coucals (*Centropus*), snakes, and such mammals as pangolins (*Manis*), squirrels (Sciuridae) and the like. They are quick to spot a potential threat, and their noisy scolds rapidly attract other birds. A pair of Himalayan Black Bulbuls was watched as the two birds successfully chased a crow away from the nest by bombarding it around the head and calling aggressively; the crow left without stealing the nest contents. Similarly, co-ordinated mobbing by a pair of Yellow-vented Bulbuls in Malaysia was enough to drive off a squirrel from an active nest. In Africa, a Common Bulbul scolded a stuffed Spotted Eagle-owl (*Bubo africanus*) which had been put out in a garden, and, after the owl had been removed, the bulbul even continued to scold the space previously occupied by it. The prize for the most extreme audaciousness goes, however, to a group of Light-vented Bulbuls in south China which was watched as it mobbed a tiger (*Panthera tigris*) so aggressively that the large cat vacated its basking place and sauntered back into the dense woods.

Most information on the roosting behaviour of pycnonotids relates to the gathering of birds in the non-breeding season. For example, reedbed roosts of Yellow-vented Bulbuls in Malaysia can run into the thousands during this period (see Movements). Large communal roosts of this species have also been recorded on several occasions on the Indonesian islands of Bangka, Sumatra and Java, generally in scrub, swampy habitats or strips of woodland near the coast; one roost was in scrub mixed with cane (*Saccharum spontaneum*). One observer counted 512 individuals passing overhead in a ten-minute period, and that in only one direction from the roost. In Borneo, one roost of Yellow-vented Bulbuls in low coastal scrub alongside reedbeds in Sabah was thought to number "several hundreds, possibly thousands". Ashy Bulbuls (*Hemixos flavala*) have also been recorded as roosting communally in the non-breeding season, sometimes favouring bamboo clumps. Red-whiskered Bulbuls, too, roost communally when not breeding. One roost of this species in Hong Kong was in tall grass, which 218 birds were seen to enter in the late afternoon. The Red-whiskered Bulbul has also been recorded as roosting in "thousands" in secondary-forest canopy in Myanmar, where, in addition, huge communal roosts of Red-vented Bulbuls have been noted in canebrakes. In that same country, a "vast gathering" of Himalayan Black Bulbuls, consisting of equal numbers of white-headed and black-headed individuals, was found at a roost in the forest canopy. One radio-tagged Black-and-white Bulbul, followed over a period of seven days, used different roost-sites each night.

Far less is known about the roosting behaviour of this family in Africa. The Common Bulbul roosts in thick foliage, including, in Morocco at least, that of fig trees or orange trees. During the breeding season, one pair in Gabon slept together in the same patch of foliage every night for two months. The Common Bulbul is noted to be one of the last bird species to retire at night and one of the earliest to call in the morning.

Bathing appears to be quite a common habit among bulbuls. The Common Bulbul bathes, sometimes in groups, in rivers, pools, gutters and birdbaths and in rainwater on foliage, and may do so in the morning or the evening. The Yellow-vented bulbul has likewise been reported as foliage-bathing in wet vegetation, and one was watched as it gathered water droplets by sliding down the midribs of banana fronds. Bathing has been reported, too, for





Bathing appears to be a common habit amongst bulbuls, at least those conspicuous species with open-country lifestyles, the details of which, if not exactly better studied, are at least more visible. The available evidence suggests that they bathe sometimes alone, sometimes in groups, in almost any available water, including rivers, lakeshores, puddles, gutters, birdbaths and in rainwater collecting on foliage. One bulbul was watched repeatedly sliding down the midrib of a recently soaked banana-leaf to douse itself. Bathing may take place in the morning or the evening, but the latter seems to be the preference of most bulbuls, especially those that inhabit forest. These have been reported visiting favoured spots for bathing and drinking, daily in the afternoon, often in the company of other forest birds. The act of bathing itself is undertaken much as in any other passerine, except with a higher than average dose of gusto. When it comes to foraging, fighting and singing, what bulbuls lack in subtlety they make up for in enthusiasm, and the same can be said of the way they bathe. A bathing ***White-eared Bulbul*** *first immerses its underparts in water, then flutters its wings vigorously, sending a shower of droplets into the air.*

[Above: *Pycnonotus leucotis mesopotamia*, region of Dubai.

Below: *Pycnonotus leucotis leucotis*, Keoladeo Ghana National Park, Bharatpur, India.

Photos: Roland Seitre]

a number of forest species, such as the Black-and-white and Cream-vented Bulbuls, the Little, Yellow-whiskered, Stripe-cheeked, Shelley's and Eastern Mountain Greenbuls, the Swamp Palm Bulbul, the Icterine and Xavier's Greenbuls, the Grey-headed and Lesser Bristlebills, the Eastern Bearded (*Criniger chloronotus*), Western Bearded (*Criniger barbatus*), Red-tailed and White-bearded Greenbuls, and the Grey-cheeked Bulbul. Many appear to favour an evening bath, in a shaded stream or pool, followed by preening prior to going to roost. Particular spots are often preferred, and several species may come together, with other forest birds, to bathe collectively. Water-filled holes in trees are also used, and foliage-bathing may occur opportunistically after rain. A. Hoogerwerf noted that, in north Sumatra, Asian Red-eyed Bulbuls, along with a range of other pycnonotids, appeared every afternoon at a "bathing-place in a brook running through the jungle". This locality was apparently close to scrub and pasture, and several species of forest and open-country bulbul visited it, together with various other birds, in order to bathe and drink in the afternoons.

It is likely that bathing is combined with drinking, but there are few reports on this. Common Bulbuls and White-eyed Bulbuls, at least, drink regularly in drier areas, by taking water from dripping outdoor taps and by sidling down the stems of reeds and similar plants to sip from the water surface below.

Some pycnonotids are known to indulge in sun-bathing. One Olive-winged Bulbul was watched as it sunned itself on a creeper-covered tree bole, its back exposed to the sun, the wings drooping and the rump plumage fluffed up, holding this position for ten seconds. V. G. L. van Someren described a Common Bulbul that sunbathed by lying on its side, spreading the tail and one wing, raising its crest and fluffing its rump feathers to allow the sun to penetrate. Similar behaviour has been reported for the Yellow-whiskered Greenbul.

Dust-bathing appears not to have been recorded for any member of the family. Anting, on the other hand, has been reported for several species, including the African Red-eyed Bulbul, the Common Bulbul and the Northern Brownbul (*Phyllastrephus strepitans*). In the case of the last-mentioned, two or three individuals were watched as they crouched, wings spread, apparently in a "semi-entranced state" on a sunlit path in the bush where many ants were present.

Voice

Many bulbuls are noisy birds. In both Africa and Asia they contribute a significant proportion of the bird sounds heard in forest-edge and shrubby habitats and, in Africa, in the forest interior, too. Their voices often have a nasal or gravelly quality, some are bubbling and conservational while others are harsh and intrusive, and yet others are pleasant pure whistles. Although the Pycnonotidae are not known for the beauty of their songs or the extent of their vocal repertoires, their voices are, generally, distinctive and provide a reliable means of distinguishing between species of similar appearance. A number of species vocalize for much of the day, especially when in company.

Some bulbuls use prominent perches from which to sing. These include the open-country members of the genus *Pycnonotus*, which choose bushtops or any other prominent perch that presents itself, such as a telegraph pole or wire, a fence or a similar station. Most *Hypsipetes* species also sing from prominent perches, often selecting the very uppermost branches of trees. Many other forest bulbuls sing from lower, rather more concealed perches, while some, such as the nicators and several *Andropadus* greenbuls are real skulkers.

Although the songs of bulbuls are a familiar feature in many habitats, few studies on the full repertoire of vocalizations have been undertaken. One exception is that of A. Kumar and D. Bhatt, who looked at sound production by Red-vented Bulbuls in north India. These ornithologists concluded that this species produces seven types of vocal signal, which they put into the following categories: social contact signals, roosting signals, two types of alarm signal, distress signals, twittering signals and begging signals. They enumerated 18 types of "social contact signal", but these vocalizations are probably not, or not restricted to, contact as they are a little too complex, and many observers would have called them the "song". The function of "song" in many bulbuls, including *Pycnonotus*, is, however, unclear. Phrases seem to be given during much of the day, and it may be that a contact function is dominant. The "roosting signals" were emitted only in the 15-minute period before, or sometimes after, roosting communally in dense trees. The two alarm signals appeared to be differentiated by intensity, type I being given when a predator was nearby and type II when a predator was very close. Following on



In the breeding season bulbuls tend to be pugnacious birds. In the genus Pycnonotus, *their aggression manifests itself in frequent ritualistic displays, and occasional brawls. A common theme is for rivals to stretch upwards, producing garbled or twittered vocalizations, while fanning their tails outwards. When evenly matched, the display of one bird is mirrored by the other, as demonstrated by these* ***African Red-eyed Bulbuls****. The same display is regularly seen if a hapless bulbul comes across his reflection in a mirror, window, shiny hubcap or the like.*

[*Pycnonotus nigricans nigricans*, near Okahandja, Namibia. Photo: Eric & David Hosking/FLPA]



Bulbuls are highly vocal birds, better known for the amount of noise they produce than the beauty of their songs. Many species produce simple, repetitive, jolly phrases at all times of day, and in all seasons, such that it is rather difficult to distinguish to what extent the main vocalization is a true song (or mating signal), and to what extent it functions in contact or cohesion between the members of pairs or groups. In any case, their vocabulary is limited for an oscine. In many bulbuls the quality of voice is somewhat nasal, gravelly or clinking; in others it is bubbling, or chattering, or harsh and intrusive. It may be pleasing to imagine that the ***Brown-eared Bulbul*** *pictured in this beautiful photograph is warbling its sweet song into the wintry snowscapes of Japan, but in reality it is producing one of the most unattractive noises made by any bird. Usually transcribed as "shreep" or "weesp", its main call is loud and unbecoming, and is unleashed remorselessly throughout the year.*

[*Microscelis amaurotis amaurotis*, Yamagata, Japan. Photo: Hirozo Maki]



Apart from the simplistic song of males, the ***Common Bulbul*** *gives a range of quieter vocalizations in different contexts. Individuals produce subdued, buzzy subsongs, for example, and a variety of contact calls. These may be uttered when one pair member is separated from its mate, but also when the two are side by side. In addition, the male gives a short burst of soft chattering calls, or a harder "cheedle-cheedle-cheedletit", when he greets the female, a moment which appears to be captured in the photograph.*

[*Pycnonotus barbatus layardi*, KwaZulu-Natal, South Africa. Photo: Roger Tidman/ FLPA]

from this, "distress signals" were uttered when the bird was actually held by a predator. "Twittering signals" appear to be a subsong, of unknown function, while "begging signals" are calls directed by nestlings and fledglings at parents.

Another study, of three *Pycnonotus* species in South Africa, recognized four types of vocalization. These correspond closely to those of Red-vented Bulbuls. They comprise a territorial song, uttered by the male only and mainly during the breeding season; a subsong, a quiet "swizzling" chatter, given by a resting individual hidden in a tree or shrub; alarm calls of at least two sorts, one for low intensity and a second for high intensity; and contact calls, which are very variable in structure. These contact calls are often uttered during the breeding season when an individual is separated from its mate, and cease when the partners rejoin each other. They were also given when the two were next to each other, however, and may therefore have an additional function of signalling to other, nearby bulbuls. These notes are also used by bulbuls in foraging flocks in the non-breeding season, and may be used by paired individuals for maintaining contact at such times.

In a third study, J. F. M. Horne examined the vocalizations of Mauritius Black and Reunion Black Bulbuls and concluded that at least four main types were made by adults. These were the "chuckle", the "cat call", the soft notes of pair contact, and the stress-induced "kek". In the case of the Mauritius Black Bulbul, the "chuckle" varied seasonally, sexually and according to context, but it formed the basis of a simple song and was used for recognition or greeting between members of a pair. The "kek" is apparently given in situations of both fear and aggression. The soft notes of pair contact, uttered by members of the pair while foraging, comprised quiet, short "chuckle" notes, similar to those used by a group of individuals feeding at a common food source, such as a fruiting tree. This was interpreted as indicating that pair-members maintain contact within a group. When one of the pair rejoined its mate after spending time apart from it, the two would "chuckle" jointly, even though they had been in contact vocally for most of the time. The "cat call", or "mew", is a long, clearly defined note, either given singly or preceded by some form of "chuckle", but no interpretation of its function was made. The same four types of vocalization were found for the Reunion Black Bulbul, but there were differences of detail. The other three *Hypsipetes* species of the Indian Ocean islands share a similar repertoire.

The extent to which other pycnonotid genera, particularly those of the forest interior, have comparable vocal repertoires awaits further study.

Although the song of most bulbul species could not be described as musical, an exception is that of the Straw-headed Bulbul. This Asian species has an intensely powerful song, very fluty and melodious, which is often given as a duet, or even in chorus by a small territorial group of adults. It was described by B. E. Smythies as "a prolonged series of magnificently warbled notes, richer and more powerful by far than the songs of such celebrated performers as the [Common] Nightingale [*Luscinia megarhynchos*] and the [Common] Blackbird [*Turdus merula*], but lacks variety and is always sung *fortissimo*." Unfortunately, this bulbul's voice has been its undoing, as it is so popular as a cagebird in Indonesia and South-east Asia (see Relationship with Man) that it has totally disappeared from the majority of its former range. In Java, its voice was, until recent decades, one of the commonest bird sounds of downtown Jakarta, a result of all the cagebirds on windowsills. The Straw-headed Bulbul is now so rare that it is becoming unusual to see it even as a cage bird.

Another member of the family with a distinct song is the Southern Golden Bulbul, found on three islands in Indonesia. In addition to various chattering calls, it has a loud, mournfully whistled phrase, usually given after some "chacking" notes, which is much more sweet and song-like than the equivalent vocalizations of most bulbuls. It is an inhabitant of dense forest, and song is probably, therefore, more important to it in communication than are visual signals. This species belongs to the genus *Thapsinillas*, traditionally considered monotypic, but geographical variation in song indicates that more than one, and probably more than two, species may be involved.

A few African pycnonotids also stand out for the attractiveness of their songs to the human ear. The two larger *Nicator* species share similar loud, varied songs that have been likened to that of the Common Nightingale or a robin-chat (*Cossypha*). Of the White-throated Nicator in the Usambara Mountains, in north-east Tanzania, R. E. Moreau wrote that "if the singing bird is some distance away, all that can be heard is a periodical burst of liquid throat-notes of a power and richness that in my experience are unsurpassed." He added that the nicator will often sit for a lengthy period in an impenetrable thicket, "making the forest resound every twenty or thirty seconds with the splendid sound. These throat-notes exceed a Nightingale's in volume, but they certainly lack variety."

Flocks of bulbuls can be very noisy, often giving loud chattering vocalizations, basically variants of the "social contact signals" described above. The noise made in the early mornings by





Although some birds seen visiting flowering trees, or even probing their bills into flowers, may be seeking the insects attracted to the nectar source rather than the nectar itself, it nevertheless appears that many bulbuls do harvest nectar supplies. Some species, especially Pycnonotus *bulbuls, and "black bulbuls" in the genus* Hypsipetes*, are often seen with colourful smears of pollen on their foreheads. These inadvertent cargoes suggest an active role in pollination, but it is equally common for bulbuls, especially those with shorter bills, to access nectar by nipping corollas at the base. They glean nectar indirectly, circumventing the plant's pollination system, and are therefore predators, not pollinators. One species commonly reported foraging on nectar is the* ***Red-vented Bulbul****, here pictured at the flowers of a silk-cotton tree* (Bombax ceiba)*. In India it has been reported visiting a wide range of flowering trees, shrubs and epiphytes, alternatively consuming young buds in their entirety, opening mature buds to access nectar, gleaning nectar from open flowers, or simply eating the petals. In Africa the* ***Common Bulbul*** *is also fond of nectar. It is perhaps most often seen at aloes, in this instance a "mountain aloe"* (Aloe marlothii).

[Above: *Pycnonotus cafer bengalensis*, Gauhati, Assam, India. Photo: Roland Seitre.

Below: *Pycnonotus barbatus layardi*, Kruger National Park, South Africa. Photo: Getaway/David Steele/Photo Access]

the "vast gathering" of Himalayan Black Bulbuls recorded at a forest-canopy roost in Myanmar (see General Habits) was likened to the din produced by a huge "murmuration" of Common Starlings (*Sturnus vulgaris*).

Paired individuals of the Yellow-vented Bulbul sometimes indulge in unco-ordinated duetting, one partner giving a bubbling song and its mate joining in with a string of emphatic "treek" notes. Duetting may be performed by other members of the genus *Pycnonotus*, and it has been recorded also for two *Phyllastrephus* species, the Terrestrial and Northern Brownbuls.

Mimicry occurs in the family, but seems to be uncommon. The White-browed Bulbul (*Pycnonotus luteolus*) in India is known to imitate the songs of several species, including the Red-vented Bulbul, the Large Cuckoo-shrike (*Coracina macei*) and the Little Green Bee-eater (*Merops orientalis*). Similarly, in Africa, the Western Nicator will mimic other species, including the Yellow-throated Nicator (*Nicator vireo*), Sjöstedt's Owlet (*Glaucidium sjostedti*), the African Pied Hornbill (*Tockus fasciatus*) and the Yellow-bellied Wattle-eye (*Dyaphorophyia concreta*), and the White-throated Nicator has been recorded as imitating the Moustached Green Tinkerbird (*Pogoniulus leucomystax*) and the Eastern Black-headed Oriole (*Oriolus larvatus*).

Food and Feeding

Bulbuls eat a wide range of foods, including fruits, seeds, nectar, pollen, arthropods and small vertebrates, as well as some carrion and beeswax. As a broad generalization, however, the majority of pycnonotids are essentially frugivores which augment their diet with a certain amount of arthropod food, although a significant minority of species, mostly in Africa and Madagascar, are insectivorous, some with quite specialized niches.

Many of the open-country species are skilled opportunists and extreme generalists. The Yellow-vented Bulbul, for example, has one of the broadest foraging niches yet measured among non-forest passerines. It collects food by (i) consuming a very wide range of fruits and nuts, both native and introduced; (ii) sallying from perches for lepidopterans and termites (Isoptera) and jumping up at them from the ground; (iii) searching foliage and bark for insect larvae; (iv) taking morsels of carrion; and (v) eating flowers and robbing nectar by piercing the base of corollas. The same is true of a number of other *Pycnonotus* species, and several studies have revealed the catholicity of their diets. For example, observations of the Common Bulbul in one area of Zimbabwe demonstrated that more than fifty species of native and introduced fruit were consumed, and another study of this bulbul, in Malawi, recorded 21 species of wild fruit, together with flower parts from at least eight genera, young leaves of acacia (*Acacia*) and nectar from two genera of plants. The range of arthropods taken by this species is equally broad, and includes alate termites, ants, aphids (Homoptera), beetles (Coleoptera), butterflies and moths (Lepidoptera), dragonflies (Odonata), grasshoppers (Orthoptera), mantids, mayflies (Ephemeroptera) and spiders (Araneae), in addition to which its diet also incorporates small lizards and geckos (Geckonidae), as well as beeswax. Similar studies of Cape and White-eyed Bulbuls obtained comparable results.

A study of Red-vented Bulbuls in Haridwar, in northern India, revealed that, of 377 observations of feeding behaviour, 55·9% involved the consumption of ripe fruits and 17% the eating of unripe fruits, with 13·8% directed at nectar and 13·8% at leaves (although these proportions narrowly exceed 100%, and make no mention of invertebrate prey). Elsewhere, an analysis of 528 faecal samples of Red-whiskered Bulbuls in Hong Kong showed that 92% contained seeds or fruit and 19% contained insect remains. These data give some idea of the relative intake of fruit, nectar and insects in the diet of common open-country species. Results were similar for the Light-vented and Cape Bulbuls. Of 414 faecal samples of the former, 96% contained seeds/fruit and 39% contained insect remains, while some 90% of the Cape Bulbul's diet comprised vegetable matter and 10% consisted of arthropods. The daily dry-weight consumption of the latter species averaged about 24% of the bird's own weight.

The means of obtaining food may be as varied as the food sources themselves. S. Ali watched Red-vented Bulbuls on mistletoes (Loranthaceae) and noted that they nipped open mature buds and probed into the exposed corolla tubes for nectar. He observed that some of these birds had a whitish streak of pollen on the head, which attached itself while they fed. This being the case, one can presume that bulbuls actively pollinate some flowering plants. Food is sometimes obtained by piracy. A Red-vented Bulbul in India repeatedly robbed a male Coppersmith Barbet (*Megalaima haemacephala*) as the latter carried fruit with which to courtship-feed his mate. Not only fruit is pirated; White-eyed Bulbuls in Israel have been recorded as chasing Hoopoes (*Upupa epops*) in order to steal mole-crickets (Gryllotalpidae) from them.

Bulbuls also often attend termite emergences. In Malaysia, for example, up to twelve Streak-eared Bulbuls (*Pycnonotus blanfordi*) have been seen together at dusk at such events, catch-



Most bulbuls are chiefly frugivorous, and the ***Sombre Greenbul*** *is no exception. It has been recorded consuming a wide variety of berries and other fruits, mostly in the small size classes. It gathers them while clambering through foliage in the shrub layer or canopy of thickets and woodlands. Berry-bearing trees or shrubs are visited repeatedly. A smaller dietary component consists of arthropods and small gastropods. These are captured in flight, gleaned from foliage, or collected from the ground among leaf litter.*

[*Andropadus importunus insularis*, Athi River, Kenya. Photo: Morten Strange]



*In one Malaysian study the **Puff-backed Bulbul** was observed gleaning figs from most of the 25 species of* Ficus *monitored, targeting fruit 5–15 mm in diameter. The individual pictured here is holding a fig at the upper end of that scale, and it is probably incapable of eating anything much larger. This species is named after the luxuriant plumage of its lower back and rump, which is sometimes raised to reveal contrasting colours. It is the sole member of the subgenus* Euptilosus, *which surely deserves separation from* Pycnonotus, *either independently, or in conjunction with other South-east Asian bulbuls. None seem closely related, but several have similar dorsal plumage.*

[*Pycnonotus eutilotus*, Malaysia.
Photo: Hirozo Maki]

ing flying termites on the wing. This same species has been noted as foraging on the ground in an unusual fashion, by lifting leaves and stones to uncover invertebrate prey with which to feed its fledglings. Some bulbuls regularly feed on the ground. Straw-headed Bulbuls, for instance, often drop from a perch down to rocks or earth banks alongside rivers, and several open-country *Pycnonotus* species feed on the ground as happily as they do in bushes. The Yellow-vented Bulbul often hops about on the ground to feed on worms, scarab beetles (Scarabaeidae), orthopterans and the like; these are struck vigorously against a branch or rock before being swallowed. This species also takes squashed fruit and dead snails from roads, as well as pieces of carrion. Common Bulbuls will regularly patrol the walls of buildings and similar sites soon after dawn, seeking insects attracted there during the preceding night by security lights. The three bulbuls in the genus *Hemixos* seem to perform flycatching more than do the majority of the members of the family; they frequently catch moths and other insects in flight, after having flushed them from hiding places.

Many of the *Hypsipetes* bulbuls are almost as catholic in their choice of food and as opportunistic in their foraging habits as are the open-country *Pycnonotus*. Thus, the Seychelles Black Bulbul has been recorded as eating 22 species of fruit, both native and introduced, as well as a wide range of arthropods and also birds' eggs. It obtains insects by gleaning from branches and trunks and probing in leaf clusters, as well as by snatching them from leaves in swooping flight, and it acrobatically takes winged insects in flight. As its congeners, however, it rarely feeds on the ground. The Himalayan Black Bulbul is inordinately fond of nectar; several individuals will often visit the same large flowering tree and they commonly display a yellow or orange frons, the forehead having become smeared with pollen.

The mainly insectivorous African genera, *Phyllastrephus*, *Bleda* and *Criniger*, are, with some exceptions, birds of the forest understorey and thickets. The name *Phyllastrephus* means "leaf-tosser" and is well given. Most members of this genus glean arthropod food from the ground, among leaf litter, fallen wood and moss, under and through which they poke about in small monospecific groups. They also take food from leaves and tree trunks, to which they may cling with fluttering wings, and occasionally make short aerial sallies. Their food comprises a wide variety of arthropods, including crickets, beetles, mantids, caterpillars, ants, spiders and the like, as well as molluscs and some fruit. The Yellow-streaked Greenbul is an atypical *Phyllastrephus* as it usually forages in the middle and upper strata of forest, where it gleans from leaves, bark, crevices, epiphytes, bundles of dead leaves and similar sites. It is often to be seen on large horizontal branches, from which it peers alternately over one side and then the other as it works along, sometimes hanging off sideways or upside-down in order to reach prey. This greenbul, when foraging, has the distinctive and conspicuous habit of deliberately but rapidly raising and lowering one wing at a time, exposing its yellow underwing-coverts, as when peering beneath a branch. This action may be intended to startle larger insect prey into movement.

Both the bristlebills in the genus *Bleda* and the bearded greenbuls in *Criniger* are regular components of mixed-species foraging flocks. The bristlebills are very much species of the forest floor, and are rarely seen more than a few metres above it. Here, they are extremely regular members of the group of species which feed on arthropods fleeing swarms of driver ants (*Dorylus*). The Red-tailed Bristlebill, the largest species, takes correspondingly large prey, including frogs and toads, in addition to beetles, mantids, termites, cockroaches (Blattodea), cicadas (Cicadidae), centipedes (Chilopoda), millipedes (Diplopoda) and spiders, as well as some fruit. The bearded greenbuls generally forage at slightly higher levels than the bristlebills, and some, but not all, of them regularly attend ant swarms. Two species, the Yellow-bearded and White-bearded Greenbuls, have a distinctive foraging method. They specialize in seeking food on vertical stems and trunks, to which they cling and which they work over, gleaning from the bark and in crevices. This habit, interestingly, is shared with two species unrelated to them, the Western Mountain Greenbul of the Cameroon highlands and Shelley's Greenbul of East Africa, while two of the even less closely related Malagasy tetrakas show rather similar strategies. One of these, the Short-billed Tetraka (*Xanthomixis zosterops*), forages mostly between 0·5 m and 5 m above the ground, by gleaning in the vegetation of small understorey trees; it frequently perches on vertical stems, up which it works rapidly, and makes short flights to catch arthropods so disturbed. The Grey-crowned Tetraka (*Xanthomixis cinereiceps*) specializes on moss-clad vertical stems, trunks and branches less than a metre in width.



*Most open-country bulbuls are hugely successful generalists. The **Yellow-vented Bulbul**, for example, has one of the broadest niches in terms of food and foraging technique of any passerine. Primarily a frugivore, it consumes berries and other fruits, from ground level to the tops of 50-m-tall trees. Small fruits are eaten whole, but larger varieties are picked at and nibbled. It eats seeds, drinks nectar from flowers, and catches a large quantity of invertebrates by jumping and sallying, or gleaning from bark and foliage; it hops on the ground to feed on worms, beetles, crickets, and other insects; it visits bird tables to eat scraps; and it even dines on carrion when the opportunity arises.*

[*Pycnonotus goiavier analis*, Katong, Singapore. Photo: Ong Kiem Sian]

A few African bulbuls have been recorded as perching on antelopes, where they groom the mammal's head, ears and eyes. They are generally tolerated by their hosts, and it is assumed that they are searching for ectoparasites. The Terrestrial Brownbul, for example, has been seen to glean ticks off red duikers (*Cephalophus natalensis*). On the other hand, the Yellow-bellied Greenbul has also been recorded as pecking at the preorbital glands of klipspringers (*Oreotragus oreotragus*), where it was possibly seeking to ingest the secretions.

Perhaps the most specialized feeding association among the Pycnonotidae is that shown by Sjöstedt's Greenbul (*Baeopogon clamans*) of west-central Africa. Although the adults of this species also take fruit and other insects, they feed particularly on the immature stages of the small black wasp *Polybioides melaina*, as well as on other hymenopterans. Moreover, the young appear to be fed exclusively on the larvae, pupae and wax of this wasp. It is a striking example of convergent evolution that this pycnonotid species should resemble so closely in appearance the completely unrelated wax-eating honeyguides of the genus *Indicator*.

Breeding

The majority of bulbuls are monogamous. A seemingly unique exception is provided by the Yellow-whiskered Greenbul, which is polygamous and non-territorial, and which apparently adopts a lekking system in part, but only in part, of its range. In Gabon, in areas where the species occurs at high densities, males assemble at traditional sites and sing in chorus. Within these leks, which can be up to 200 m long and 50 wide, each male defends an area of some 20 m in diameter around his songpost, within which he chases off all intruders. The females, which are entirely responsible for raising the young, exhibit a total lack of territoriality, nesting to within 2–3 m and in full view of each other. Studies elsewhere in the Yellow-whiskered Greenbul's range, such as in Kenya and Nigeria, indicate that the species is monogamous and territorial in these regions.

There is also evidence of co-operative breeding for some pycnonotids and it is suspected for others. This strategy may prove to be more common within the family than is currently thought. Evidence is perhaps strongest in the case of the Spotted Greenbul, possibly the most gregarious of all species; fledged young of this greenbul have been seen being fed by four or five members of a group of adults, and observations of the provisioning of nestlings imply the same thing. Likewise, groups of three Short-billed Tetrakas have been observed to feed the same dependent juveniles. Otherwise, the evidence is mostly circumstantial. In the case of the Swamp Palm Greenbul, three or four individuals defended a nest at the approach of an observer, and groups of three adults both of the Yellow-throated Greenbul and of the Seychelles Black Bulbul may jointly defend territories. White-eared Bulbuls in Iraq regularly move around in trios during the breeding season, including the nest-building phase, suggesting that pairs may be accompanied by a helper. Other Asian species suspected of co-operative breeding include the Crested Finchbill (*Spizixos canifrons*), the Straw-headed Bulbul, fledglings of which are sometimes fed by adults other than their parents, and the Yellow-browed Bulbul (*Acritillas indica*), which usually travels in small groups of 6–7 individuals even when feeding young. Similarly, three adults were almost certainly feeding young in one nest of the Puff-throated Bulbul, and several other *Alophoixus* bulbuls are often to be found in groups of 5–8 birds, which seem to be made up of a recent brood accompanied by more than two adults. Co-operative breeding may be the norm in all these cases.

Many pycnonotids breed at varying times of the year and are multi-brooded. Numerous open-country *Pycnonotus* species have been recorded as nesting in all months, and some are known quite commonly to raise three broods in a year, with a maximum of five broods recorded. In equatorial regions, many African species are reported to breed throughout the year, and a good number show a peak of nesting activity associated with short dry seasons; in East Africa, however, there is a tendency for the breeding seasons of both insectivorous and frugivorous species to coincide with the main rains. That generalizations are difficult is illustrated by the Little Greenbul, for which the short dry season in Gabon, in January–February, is the main breeding period, although reproductive activity is recorded in other months; in Itombwe, in DRCongo, on the other hand, this species breeds in all months except the short dry season, there June–August. Among species of montane forest, however, breeding activity tends to be suppressed during the wettest, coldest times of the year.



*The diet of the **Common Tetraka** is highly unusual for a bulbul, which makes sense in view of the fact that it belongs to a Malagasy radiation apparently unrelated to the Pycnonotidae. The extraordinary bill is ideally suited to insectivory, but too long and slender for frugivory; indeed, there is no sign of fruit in the diet at all. Instead, it forages exclusively on insects and small animals, searching for these by clambering up or down trunks or branches, and by peering and probing in dense tangles, dead-leaf clusters, palm fronds and epiphytes, usually 1-20 m above the ground.*

[*Bernieria madagascariensis madagascariensis*, Mt Marojejy, Madagascar. Photo: Roland Seitre]

In southern India, an intensive study of breeding Red-vented and White-browed Bulbuls in Tamil Nadu, in which over 100 nests were found, concluded that the breeding season was annually variable, depending on environmental conditions. Moreover, the two species were not synchronized. In two seasons their peak breeding times overlapped, whereas in another season they nested at slightly different times. No obvious correlation with rainfall could be discerned, although there was a "trend" for breeding to coincide with the start of the wet season. There was, however, a link between the timing of emergence of caterpillars and the breeding of the Red-vented Bulbul. This species feeds its young on caterpillars, and a close correlation was found between peaks in caterpillar abundance and peaks in the bulbul's breeding activity. Nestlings of the White-browed Bulbul appear not to be fed on insects and seem to rely, instead, largely on fruit; there was an indication that the timing of breeding by this species was related to rainfall and fruit production.

It has been shown that good fruiting conditions can prompt some bulbuls to attempt an additional brood. For some species, environmental conditions and the quality of the fruiting season will increase the number of broods produced per annum by one or two. Conversely, a failure of the fruiting season sometimes causes a crash in breeding success. During a long-term study of forest birds in Sarawak, very few fledglings were produced by *Pycnonotus* species in 1966, the explanation for which was a dip in fruit availability caused by environmental factors.

During the breeding season, many bulbuls are very aggressive. Red-vented Bulbuls, in common with many members of the genus *Pycnonotus*, are known to fight for long periods at this time, and this habit has resulted in human exploitation (see Relationship with Man). The Black-headed Bulbul has been noted as repeatedly fighting, with two individuals, the sexes not identified, tumbling to the ground from trees, locked in a fluttering grapple. Male Square-tailed Black Bulbuls also fight fiercely in the breeding season, and defend their nests vigorously against all types of predator.

Courtship behaviour, for those few members of the family for which it has been described, is relatively modest. It is best known for the genus *Pycnonotus*. Thus, Ali and S. D. Ripley state of the Red-whiskered Bulbul that the male postures before his mate, "flattening himself on a perch, lowering his head in a continuous bow, spreading his tail, drooping his open wings loosely at the sides, and gently fluttering or quivering them to the accompaniment of subdued croaks." The male sometimes sings while displaying in this manner; he then hops on to the female's back, and copulation ensues. Other descriptions of this behaviour, for the same species, have pointed out that the male fluffs out his plumage and spreads the vermilion undertail-coverts laterally, to which the female reacts by depressing her crest, lowering the head, wings and tail, and performing curious side-to-side motions with her beak while she utters inane chirps and quivers her wings. White-eared Bulbuls perform a similar display, and it is likely that all of the related *Pycnonotus* bulbuls possessing a brightly coloured vent have a similar crouching behaviour wherein the male spreads and flutters his wings, often above his head, spreads and depresses his tail, and opens out the vent feathering to show off his chief mating signal. Bearing in mind the lack of sexual dimorphism in bulbuls (see Mor-



*The **Slender-billed Greenbul** is an aberrant member of the African genus* Andropadus. *It is generally found in the canopy of evergreen forests, infrequently dropping lower at edges, usually occurring in pairs or small family groups. It sometimes flocks with frugivores at fruiting trees or vines, or associates with mixed-species flocks of insectivores. The diet includes a wide variety of arthropods, including orthopterans, lepidopterans, mantids and arachnids, and this bulbul is occasionally seen flycatching with other species at post-rain emergences of alate termites and ants.*

[*Andropadus gracilirostris percivali*, Mt Kenya, Kenya. Photo: David Fisher]



Most bulbuls drink water regularly, favouring secluded streams, pools and puddles, but taking advantage of artificial supplies of water where available. Several forest-dwelling species are thought to drink regularly in the late afternoon, often combining the activity with bathing. The bulbuls most regularly seen drinking, however, are birds of human settlements and open country, such as the ***Common Bulbul****. In hot climates, these birds seem to need a lot of water, and are found drinking at any time of day, even at dripping taps and leaking pipes.*

[*Pycnonotus barbatus layardi*, Stone Hills Game Sanctuary, Zimbabwe. Photo: J. R. Peek]

phological Aspects), however, it is difficult to identify the sex of the active party, unless copulation ensues. It is thus by no means certain that females never perform these displays, a possibility that will be answered only by intensive study of colour-ringed individuals of known sex.

Similar displays are given by African members of the genus. For example, the male of the African Red-eyed Bulbul performs a characteristic whining wing-flutter display. In this, the body is arched, with the head bent forward and down, the rump and lower back feathers are fluffed up like a puffball, the wings are drooped, with the primaries spread and fluttered gently and continuously, and the tail is spread widely so that the outer rectrices are close to the primaries. Just prior to mating, the spread tail is often bent down vertically. The displaying male sways back and forth, sometimes rotating in a circle, uttering a soft, whining vocalization throughout. The female usually hops closer and around the displaying male, and, in cases where mating takes place, she also often gives this display in close proximity to the male.

Two Asian members of the genus *Pycnonotus*, the Yellow-vented and Flavescent Bulbuls, share a display in which the male and the female perch close to each other. Both sexes then sing, with the wings raised and fluttered over the head.

Pre-copulatory display by the Sombre Greenbul involves the partners facing each other on a horizontal branch, where the male rapidly raises and lowers his head in an elliptical arc, periodically rotates slowly in a complete turn while still head-bobbing, all the time with the feathers of the crown and nape raised, rapidly quivers his slightly opened wings, and utters a soft, keening call with the beak slightly open. The female also bobs her head, out of phase with the male, and utters the same keening call. In the corresponding display by Cabanis's Greenbul, the male intermittently flicks his wings and fans his tail, while erecting his crown feathers and fluffing out those of the throat and rump, and hops in a circle through undergrowth while making a low bubbling call. The female may solicit with shivering wings.

What may possibly be a breeding display has been described for the Black-collared Bulbul. An individual of this species would dart upwards in short jerky flight, with noisy wingbeats, to about 30 m in the air, and remain there for several minutes, before descending rapidly and jerkily. This performance was accompanied by continuous chattering.

There is some evidence of mate-guarding. In Kashmir, for example, the male Himalayan Black Bulbul is said to accompany the female closely during the breeding cycle, suggesting that the male defends his mate against extra-pair copulations. Similar behaviour has been recorded for other pycnonotids. Perhaps surprisingly, courtship feeding has not been reported.

The Common Bulbul is said by van Someren to mate for life in Kenya, whereas Brosset and C. Érard found that pair-members of this species in Gabon may remain together for only a couple of nestings. Rates of mate turnover appear to be greatest where there is considerable and rapid seasonal change in vegetation, as in clearings around villages and in overgrown, abandoned agricultural land, and lowest where the vegetation is less prone to change, such as streamside brush, woodland edge and in gardens.

Most bulbul nests consist of an open cup of leaves and thin pliable plant fibres, built in a tree or shrub. They are usually supported in a fork, but some species, of which the Yellow-browed Bulbul, the Himalayan Black Bulbul and the Tiny and Yellow-Streaked Greenbuls are examples, may sling the nest between twigs. A number of African forest-interior species often incorporate the fungus *Marasmius* into the construction; the black mycelial threads of this fungus grow and ramify through the nest structure, helping to bind it together. The nests of at least two species of *Nicator*, a genus that almost certainly does not belong with the Pycnonotidae (see Systematics), differ considerably, being small, shallow and saucer-shaped. That of the Western Nicator is rudimentary, consisting of a few fibres and rotting twigs laid over a few sticks; the entire structure relies on fungal hyphae growing from the twigs to bind the nest to its support. The White-headed Bulbul (*Cerasophila thompsoni*) also appears to be highly unusual in that it builds its nest in holes in banks. At least five nests of this type have been reported in Myanmar, all 1–2 m above ground level in the sides of cuttings, mostly on a fairly pronounced shelf with a slight recess above it and surrounded by some open vegetation. Another nest of this species, however, was reported to be of the more "normal" sort, an open cup in a low bush, above some cleared ground, but also on a steep bank. Given the unusual nature of these nests, and the lack of formal description included in the paper reporting them, further verification of this nesting strategy is needed.

Some members of the family, such as the Himalayan Black and Square-tailed Black Bulbuls, tend to select nest-sites in isolated trees, often separated from the main forest by a gap of a few metres. This may be a strategy designed to protect the nests against arboreal predators, such as snakes, rats and monkeys. These pycnonotids nest higher up than do most bulbuls, often 5–15 m above the ground, frequently in the canopy, or at the end of long branches; they are therefore probably susceptible to arboreal preda-

tors. The only known nest of the Slender-billed Greenbul, another canopy species, was built in a similar situation.

Nests are sometimes built in odd locations. Both the Yellow-vented Bulbul and the Red-whiskered Bulbul have been recorded as nesting on the ground beneath a bush, and nests of the Red-vented Bulbul have been found in even more exotic sites, such as within buildings, in potted plants on verandahs, in roof thatching and stacks of straw, or even down wells. A nest in Myanmar was made in grass in a vase, and another, in India, was on a chandelier, in each case in a drawing room. The prize, however, goes to the pair of Red-vented Bulbuls that nested repeatedly on the luggage racks of a staff bus in Ahmedabad, in India. The bus was usually parked, but operated twice a day, morning and evening; the female would incubate peacefully while the bus plied its route, but the male generally stayed at the bus station and awaited his family's return. More than one brood was successfully raised in this fashion.

The nesting material used may also be highly variable. Red-vented Bulbuls, and many other *Pycnonotus* species, will often use man-made material, and they vary the make-up of their nests depending on locality and season. In India, nests in Tamil Nadu tended to be made of different plants depending on season, and, of three nests found in an industrial estate in that country, two were structures consisting of about 50% copper wire, a material commonly left lying about in the area. Both White-eyed and Cape Bulbuls sometimes incorporate sheep's wool, feathers, paper, string, newspaper, strips of plastic and other human rubbish into their constructions.

With most species, it is the female that builds the nest, although Ali and Ripley state that both sexes of the Red-whiskered Bulbul share in the task of nest construction. A well-watched colour-ringed population of Red-vented Bulbuls in Fiji allowed a detailed insight into the roles of the sexes in nest-building. Females undertook almost all of the work, the males accompanying them all the while, probably, as mentioned above, for reasons of mate-guarding in the fertile period, rather than assisting. Apparently, the male sometimes brought nesting material back, but this happened only rarely. In the case of the Seychelles Black Bulbul, both members of the pair may share nest-building duties in the early stages, and the presumed female will subsequently complete the construction alone, using material brought by her partner.

Nest-building by Red-vented Bulbuls took 2–5 days, after which there was a pause of 1–2 days before the first egg was laid. Similar figures are reported for other species: 3–8 days for the Yellow-throated Bulbul (*Pycnonotus xantholaemus*), about 6 days for the Flavescent Bulbul in Myanmar, 2–10 days for the Cape Bulbul, with construction taking place mostly during 07:00–11:00 hours, and 6–10 days for the Seychelles Black Bulbul. One pair of Streak-eared Bulbuls took 4 days to build its nest, and the first egg was laid on the fourth day.

In general, bulbul nests are well separated, but in some instances nests are clumped, almost in a loose colony. In Fiji, on two separate occasions, and in Tamil Nadu, India, on one occasion, three active nests of Red-vented Bulbuls were found within a radius of three metres. Similarly, in Tamil Nadu, India, 2–4 nests of the White-browed Bulbul were regularly found within a radius of 8 m. No explanation has been forwarded for this behaviour, but it may be that joint nest defence confers some advantage, especially where predation rates are high.

For the majority of pycnonotids for which relevant data are available, the eggs are generally laid early in the morning at one-day intervals, beginning one to four days after nest completion, and incubation commences when the clutch is complete. There are, however, some exceptions. The laying interval of Red-vented Bulbuls is sometimes two days and in some species intermittent incubation may begin with the first or second egg, resulting in a disparity in hatching dates and in the sizes of nestlings.

In many African species, the clutch usually consists of two eggs and sometimes of three, although *Pycnonotus* species not uncommonly lay four or five eggs, while the clutches of Western Nicators are always of just one. Some regional variation in clutch size occurs among Red-vented Bulbuls. In Sri Lanka, for example, pairs in the highlands tend to lay three eggs, whereas those in the lowlands tend to lay two. Similarly, Red-vented Bulbuls in the Himalayas lay larger clutches than do those from the hotter lowlands of southern India. There is much variation in egg colour, both within and among species, and many eggs are distinctively, and often attractively, marked. The ground colour is usually pale, often whitish, cream or pinkish, and overlaid with darker spotting or scrawling which is frequently concentrated as a ring around the larger end, sometimes forming a cap.

Incubation is usually undertaken by the female alone, and for most species lasts 11–14 days. The males of some species, however, occasionally incubate for short periods, usually no more than a few minutes, although the male Seychelles Black Bulbul may incubate for up to one hour per day. Hatching is normally



There are a few reports of bulbul nests built by both sexes, but in most well-studied cases the female does all the work, either alone or closely accompanied by the male. In general, male birds following nest-building females are not offering practical or moral support, they are simply making sure that their partners do not mate with rival males during the fertile period. In all likelihood, therefore, this is a female ***Himalayan Bulbul****, and the task of nest construction will take her anything between 2 and 10 days. She will lay the first egg 1–10 days after the nest is finally completed.*

[*Pycnonotus leucogenys*, Dachigam National Park, Jammu and Kashmir, India.
Photo: Joanna van Gruisen/Ardea]



Breeding information is scant for the five Malagasy tetrakas. From the few data gathered it appears that their nests are unusual, which makes sense in view of the recent findings that they are not related to bulbuls. This ***Short-billed Tetraka*** *has built a beautiful pouch of slender stems and moss, slinging the structure hammock-style between the branches of an understorey shrub, not far above ground level. The outer layer is adorned with dead leaves, a technique that no doubt helps camouflage the structure. It is neater than most bulbul nests, most of which are supported beneath the cup rather than attached at the rim.*

[*Xanthomixis zosterops*, Madagascar. Photo: Dominique Halleux/Bios]

synchronous, but in some cases, including the White-browed and Red-vented Bulbuls, it may be asynchronous (in one extreme case the two eggs of a clutch hatched a week apart).

Bulbul chicks are nidicolous, helpless and blind for the first few days. Observations on post-hatching development at one closely watched nest of a pair of Streak-eared Bulbuls in Malaysia are typical. On the first day after hatching, the single chick weighed 3·4 g, this rising steadily to 10·3 g by the fifth day, by which time its eyes were still closed; on the following day, its weight had risen to 13·2 g and the eyes were fractionally open. By the seventh day, the nestling's eyes were fully open, all feathers were in pin, and the wing and contour feathers were just out of pin; by the tenth day, the tail feathers were out of pin and the chick weighed 20·1 g. The youngster fledged twelve days after hatching. As this chick was alone in the nest, it probably developed slightly faster than would chicks in broods of two or more. Of interest, incidentally, is E. C. Stuart Baker's statement that nestlings of White-throated Bulbuls in north-east India are not molested by leeches, no matter how numerous the latter are. Given that leeches can be a scourge of defenceless nestling birds, this raises the possibility that the bulbul chicks have developed some defence, perhaps biochemical, against these blood-sucking annelids.

The nestlings of some pycnonotids, such as the Red-vented, Red-whiskered and Cape Bulbuls, tend to be fed initially with more soft-bodied insects and larvae than are present in the adult diet, presumably as a means of providing sufficient calcium and protein to meet their growth requirements. Similarly, Yellow-whiskered Greenbul chicks are fed only with insects for their first four days, then with a mixture of fruit and insects and, during the last week in the nest, with fruit alone; studies have shown that they are fed, on average, every 40 minutes. The young of Sjöstedt's Greenbul are provisioned exclusively with wax, larvae and pupae of the wasp *Polybioides melaina*, an important source of food for the adults of this species (see Food and Feeding). A particularly unusual observation concerned an adult Red-vented Bulbul that delivered a young 9-cm lizard (*Calotes versicolor*) to a chick 5–6 days old and of roughly the same size as the reptile; this oversized food item eventually caused the death of the nesting, which had attempted to swallow it.

In most, if not all, pycnonotids, the female does the majority of the brooding but both sexes contribute to provisioning. Yellow-whiskered Greenbul chicks are brooded closely by the female for the first week, and thereafter at intervals, until they are almost feathered; the males may feed the chicks directly or may pass food first to the female, she then feeding the brood. Chicks of the Yellow-bellied Greenbul are brooded closely for the first two days after hatching, during which time the female is fed at the nest by her mate. It was found that, on day three, the male fed the chicks and then brooded them while the female went off to find food; she returned and fed the brood, after which both parents left the nest for a while. Both Common and Red-vented Bulbuls have been noted to remove faecal sacs carefully from the nest, sometimes swallowing them, up to the time when the young fledge, such that the nest and the ground below it remain completely clean. This behaviour is also recorded for the Cape Bulbul: the nestlings' faeces were swallowed by the parents until the eighth day, after which sacs were removed and dropped 5–20 m from nest.

The fledging period is in the range 12–16 days for most species for which data are known, although it is shorter, only 9–11 days, for the White-browed and White-eared Bulbuls and 21 days in the case of the larger Seychelles Black Bulbul. In Kenya, van Someren reported that 16-day-old nestlings of a pair of Yellow-bellied Greenbuls were able to stand up, stretch and preen. Their parents then induced them to leave the nest by holding berries in the bill while calling to the chicks from a branch 0·5 m away; the young at first remained in the nest and answered the parents' call, but then they hopped and flapped out and on to the branch. On subsequent feeds, the young were tempted farther from the nest. The single chick of the Western Nicator leaves its nest after 16–18 days, well before it is able to fly, because by this stage the nestling is too big for it. The chick moves about on branches with agility, watched over by one parent; in situations of danger, the parent gives the alarm and the youngster remains motionless among leaves, well camouflaged by it spotted appearance.

Young Yellow-vented Bulbuls make their first independent captures of insects from the fourth day after fledging, but they continue to be tended by the parents for a few weeks. In captivity, the parents made feeding visits to their offspring for approximately one month after the latter fledged. The young of Seychelles Black Bulbuls are reportedly fed by the adults for one week after fledging, although other observations indicate that begging juveniles are ignored or chased off. Cape Bulbul fledglings, in con-



The classic bulbul nests are built by familiar members of the genus Pycnonotus, *such as the* ***Cape Bulbul****. These nests are bulky, sturdy and often poorly concealed. They usually consist of a foundation of coarse twigs, resting in an upright fork, or otherwise supported underneath by branches. The open cup is built atop this foundation, again from fairly coarse material such as twigs, stems, grasses and rootlets. The interior surface is lined with finer plant fibres, and whatever soft material is available in the vicinity: sheep's wool, cobwebs, feathers, paper, string and other human rubbish. In most bulbuls only the female incubates.*

[*Pycnonotus capensis*, southern Karoo, near Ladismith, South Africa. Photo: Warwick Tarboton]

trast, are fed for at least two weeks and occasionally for a month; they are fully independent by 40–50 days after leaving the nest.

During long-term mist-netting studies in both Singapore and Sarawak, most young bulbuls were not trapped until at least 4–6 weeks after fledging. This is presumably because they receive much food from their parents before that time, and consequently fly around very little. As with many forest birds, bulbuls tend to have a prolonged period of parental care. In Fogden's study in Sarawak, it was found that adults of the forest-dwelling Puff-backed, Grey-cheeked and Yellow-bellied Bulbuls fed their offspring for at least ten weeks. This reduces their ability to have second or third broods, something which is often achieved by open-country bulbuls, and is probably associated with a general scarcity of resources, or a specialism in foraging techniques that requires young birds to gain experience over a longer period of time. In this instance, the three bulbuls with the longest period of parental care, those mentioned above, were also the most insectivorous during the post-fledging period. Conversely, members of the genus *Pycnonotus* that were chiefly frugivorous, such as the Olive-winged Bulbul, had much shorter periods of parental care, presumably because the practice of foraging on fruit in the rainforest is much easier, especially when the fruiting season is a good one.

On the approach of a predator, adults of several Asian *Pycnonotus* species, including the Himalayan, Red-whiskered, Yellow-vented and White-eared Bulbuls, defend their nests or fledglings by conspicuous distraction displays. They feign injury and flutter to the ground as if unable to fly; if approached closely, they fly back up to a safe perch. Individuals have been seen to lead crows and dogs away from recently fledged chicks in this manner. In the case of the Himalayan Bulbul, at least, both adults feign injury, demonstrating that males have a high level of investment in parental care. Ali and Ripley state that Red-whiskered Bulbuls, when their nests are threatened, drag themselves along the ground with outspread beating wings, screaming piteously.

Such displays are reported for several African species, too. The female Yellow-whiskered Greenbul, for example, drops to the ground, lies there while fluttering, and then crawls off with drooping wings and spread tail; she may sometimes run off noisily, like a rodent, upon hitting the forest floor. On one occasion, van Someren followed a female which fluttered along the ground for 15 m, flew into bushes, and then continued for a further 10 m, before disappearing; when the observer returned to the nest, the hen was already back on it. On another occasion, the greenbul gave a distraction display for a distance of 20 m while the observer, instead of following her, remained at the nest; when she saw that her display was not working, she flew back and resumed incubating, even though the observer was still standing by the nest. Similar behaviour has been reported for members of the genera *Cholorocichla*, *Phyllastrephus* and *Nicator*. Not all bulbuls perform distraction displays, however: in a study of Red-vented Bulbul and White-browed Bulbul in Tamil Nadu, India, the former regularly feigned injury whereas the latter never did.

What data there are on breeding success of pycnonotids indicate that it is generally low. For example, V. S. Vijayan noted



The ***White-browed Bulbul*** *is a common breeding bird in Sri Lanka and south India, where nests have been found in all months, with little sign of strict seasonality. Pairs raise, or at least attempt to raise, several broods a year. Its nest is smaller than those of true* Pycnonotus *bulbuls, an unlined, flimsy structure which, according to one study in Tamil Nadu, India, is preferentially sited in thorny bushes. The same probably applies to Sri Lanka, as this photo testifies. The clutch typically contains two eggs, which are usually incubated by the female for 11 days; the nestlings fledge some 10 days later.*

[*Pycnonotus luteolus insulae*, Sri Lanka. Photo: T. S. Zylva/FLPA]

that, of 134 eggs laid by Red-vented Bulbuls during a 16-month period at Point Calimere, in south India, as few as eleven, or 8·3%, survived to produce fledglings. Similarly, of 114 eggs laid by White-browed Bulbuls at the same site, only 15, 13·2%, produced fledglings. Chicks died in the nest from what appeared to be starvation, or eggs were infertile, or predators took their toll.

In Africa, Brosset and Érard found that 27 of 38 nests of Icterine Greenbuls in Gabon were destroyed by predators; further, in the eleven nests which did produce flying young, one egg was infertile in four cases, one young disappeared in three cases, and in eight instances only a single young fledged. Also in Gabon, where the Yellow-whiskered Greenbul, as mentioned at the beginning of this section, breeds polygamously, using a lek system, this species' breeding success varies widely with predation levels; 45–85% of nests were preyed on annually, with a mean of 75%. A complete cessation of breeding by Yellow-whiskered Greenbuls was observed in two successive years, even though environmental conditions remained unchanged and other bird species bred normally. This reaction was thought to be probably an anti-predator strategy, because, in the year in which breeding resumed, predation of nests fell to 46% and the local population of Yellow-whiskered Greenbuls jumped by 50%, with 2·43 young fledged per nest. In the following four years, nest predation increased to 78%, while the number of fledglings fell to 1·95 per nest. In a study of Cape Bulbuls in South Africa, 233 eggs laid produced 63 fledglings, a success rate of only 27%. The survival rate of fledglings was estimated to be 18% after one month and 10% after one year.

The design of bulbul nests leaves them vulnerable to brood parasites. In Asia, the only species reported to be affected are the Red-vented and Flavescent Bulbuls, both parasitized by the Jacobin Cuckoo (*Clamator jacobinus*), but it is likely that several more pycnonotids in the region are cuckoo hosts. This is certainly true if one judges on the basis of information from Africa, where the Jacobin Cuckoo is known to affect Common, African Red-eyed and Cape Bulbuls and Sombre Greenbuls. In addition, the Yellow-whiskered Greenbul and the Common Bulbul are hosts of the African Emerald Cuckoo (*Chrysococcyx cupreus*), the Yellow-throated Greenbul and the Common Bulbul are hosts of the Red-chested Cuckoo (*Cuculus solitarius*), while the Common Bulbul is further parasitized by both Klaas's (*Chrysococcyx klaas*) and Diederik Cuckoos (*Chrysococcyx caprius*). In a four-year study in one area, levels of parasitism of Cape Bulbuls by Jacobin Cuckoos varied between 12% and 73%, the mean being 39%. Since many parasitized nests were preyed upon, however, losses to cuckoos amounted to only 7%.

Rates of predation suffered by many common pycnonotids seem to be high. R. M. Betham noted that clutches of White-eared Bulbuls in Pakistan were usually preyed on shortly after laying. According to him, the "remark that the bulbul performs the function of the domestic fowl to crows and such like by providing the egg for the breakfast table" seems to be a very apt one. He noted, as have many others, that bulbul nests are easy to find, as the adults are not particularly circumspect around the nest. Perhaps this goes some way towards explaining the high levels of predation reported for some species. Ali and Ripley wrote that the eggs and nestlings of the Red-whiskered Bulbul suffer very heavy predation, principally by cats, crows, koels (*Eudynamys*) and *Calotes* lizards. Predation of Red-vented Bulbul eggs and nestlings in Pakistan by crows and *Calotes* lizards is common, and one nestling was consumed by a saw-scaled viper (*Echis carinatus*). In south India, the survival rate of Red-vented Bulbul offspring is only 13%; the figure drops to 8% in the introduced population in Fiji, presumably a result of higher rates of predation. It is interesting to note that such low breeding success has not affected this species' ability to colonize Fiji, where it has become widespread and abundant in less than 80 years.

In Gabon, of a total of 35 nests of Eastern Bearded Greenbuls, as many as 26, or 74%, were destroyed by predators, including in two cases by mandrills (*Papio mandrillus*), as were 82% of 64 nests of Lesser Bristlebills. Losses to predation of Common Bulbul nests were somewhat lower, amounting to 42% of 64 nests, all destroyed by driver ants. Predation rates in a study of Cape Bulbuls were 60–83%. Of these losses, 70% were due to mammals, particularly rodents such as the vlei rat (*Otomys irroratus*), the forest dormouse (*Clavigulus murinus*) and the four-striped grass mouse (*Rhabdomys pumilio*), but also vervet monkeys (*Cercopithecus aethiops*), mongooses (Herpestinae) and felids; birds, primarily White-browed Coucals (*Centropus superciliosus*) and Southern Boubous (*Laniarius ferrugineus*), were responsible for 16%, and snakes, mainly *Dasypeltis scabra*, for the remainder.



Bulbul chicks are nidicolous, by which it is meant that they are blind, naked and helpless during the first few days after hatching. They rapidly develop pin feathers from feather tracts, with the tips of wing and contour feathers emerging from pin by the seventh day after hatching, by which time the eyes are fully open. The nest of this ***Cream-vented Bulbul*** *is a bulky structure of twigs and creeper tendrils (and what seem to be horsehair fungal hyphae). It contains a brood of two, which is typical for tropical members of the family. The size of broods rises to 4, or at most 5, in species that nest at much higher latitudes or altitudes.*

[*Pycnonotus simplex simplex*, Panti Forest Reserve, Malaysia. Photo: Jimmy Chew]



From what is known about provisioning in bulbuls it would appear that adults, regardless of the extent of their own frugivory, tend to feed their nestlings mainly with soft-bodied insects. While this seems to be especially true in the first few days after hatching, the proportion of fruit in the diet increases steadily as the fledging date approaches. In general, therefore, the diet of bulbuls contains more invertebrate food when the birds are nest-bound than at any other stage of life. This tendency relates to the calcium and protein requirement of chicks: a young ***Olive-winged Bulbul*** *fed exclusively on fruit probably takes much longer to fledge, greatly increasing the risk of predation.*

[*Pycnonotus plumosus plumosus*, Singapore.
Photo: Ong Kiem Sian]

Movements

Pycnonotids are, for the most part, sedentary birds. Some species, however, in at least parts of their range, may be locally nomadic. This is thought to be a response by some frugivorous species to the fluctuating availability of food supplies. The Black-and-white Bulbul is perhaps the most pronounced nomad, large influxes of this species having been recorded in, for example, the river-terrace forest of the Endau–Rompin conservation area in Peninsular Malaysia, coinciding with extensive synchronous fruiting events. D. R. Wells writes that such gatherings occur to no obvious seasonal schedule; small to large numbers invade a presumed temporarily attractive locality quite abruptly, remain for a few weeks to a few months, and then disappear as suddenly as they came, not to be seen again for periods of months up to as long as one year. The Black-and-white Bulbul is unusual in that it appears to disdain all figs, a widely available food source which other forest-dwelling *Pycnonotus* bulbuls in the region exploit in between flushes of other kinds of fruit.

Elsewhere, other members of this genus are nomadic in parts of their range in the non-breeding season. Thus, the Common Bulbul is reported as wandering locally in north Africa during the northern winter, while populations of the same species vacate the most arid parts of their Sahelian range, in Senegal at least, at the height of the dry season. Towards the southern end of the continent, during the austral winter, the African Red-eyed Bulbul undertakes movements, sometimes in large numbers, into marginal areas of its range, including shifts of up to 200 km northeast of its breeding distribution in northern Botswana. This species also makes regular but temporary influxes into parts of the arid central Karoo, these coinciding with periods of high rainfall or with fruiting seasons of trees and shrubs.

Large non-breeding aggregations of Yellow-vented Bulbuls roost communally in Malaysian reedbeds. Regular-effort mist-netting conducted during the 1960s at two roosts in Selangor recaptured only 7% of 1437 individuals ringed over three consecutive years at a *Phragmites* reedbed site. This poor return suggests either that these roosts attracted a sustained throughput of dispersing bulbuls which did not return regularly, or that many nomadic non-breeding individuals make opportunistic use of a succession of such roosts.

Some forest-interior pycnonotids also appear to be nomadic. Several long-term mist-netting studies in Malaysia have demonstrated that retraps of many bulbul species are rather few, because, it is thought, many frugivorous species are non-territorial and are constantly on the roam in search of transient food sources. This is in contrast to *Alophoixus* species, which are regularly retrapped, often in the same net-lines, suggesting that these insectivores defend territories throughout the year. These findings are mirrored by similar studies in Africa, where, in Gabon for example, very few ringed Little and Yellow-whiskered Greenbuls were ever retrapped, whereas the rates of recapture for some of the more narrowly insectivorous species, such as those in the genera *Phyllastrephus* and *Bleda*, were much higher. Elsewhere in Africa, however, the Yellow-whiskered Greenbul, at least, appears less inclined to wander; the population in Ogba, in Nigeria, was thought to be sedentary.

Altitudinal migration has been observed for a number of species. A good example is that of the Himalayan Black Bulbul, which is often resident regionally in the Himalayas, but moves downslope in the cold season. In Himachal Pradesh, it is found between 1220 m and 2130 m in winter, shifting upslope to 1830–3050 m in the summer, when it breeds. Other common species in the region, such as the Red-vented and Himalayan Bulbuls, do not exhibit such behaviour. At the opposite end of India, in the southern part of the Western Ghats, another *Hypsipetes*, the Square-tailed Black Bulbul, has also been noted as making seasonal altitudinal movements, breeding at high elevations and then, in July–December, moving to lower levels. This species vacates many areas in the southern Western Ghats, such as the Silent Valley, during the peak of the monsoon season, unlike the Yellow-browed Bulbul, which is permanently resident regardless of the strength of the monsoon. It has been suggested that the higher levels of frugivory and generalism in the diet of the latter allows it to be sedentary, while the more insectivorous *Hypsipetes* is forced to look elsewhere for its food supply.

A number of African members of the family also undertake altitudinal migrations. For example, all five montane species of *Andropadus* are known to move, or suspected of moving, to lower levels during the non-breeding season in at least parts of their ranges. These movements generally coincide with the cold, dry season, and are probably related to food shortages at higher el-





Rather a large proportion of bulbuls are group-living, and in several of these cases breeding appears to be co-operative. Given that the ***Yellow-streaked Greenbul*** *often consorts in small groups of 5–6 individuals, we might expect to find communal provisioning or helpers at the nest in this species, but the available evidence suggests that it is monogamous, and that groups disband into pairs for breeding. Most true co-operative breeders form monospecific flocks, but this taxon very often associates with mixed-species aggregations of insectivores. Like them it is almost wholly insectivorous when adult, catching grasshoppers, beetles, bugs, caterpillars, spiders and small gastropods, supplemented with only a small amount of fruit. Unsurprisingly, most food items brought to the nest are insects too, and these are stuffed deeply into the gape of nestlings. In most young bulbuls the gape is brightly coloured, usually red and often uniform, but occasionally with some patterning. Of interest, therefore, is the fact that nestlings in this species have bright yellow gapes, according to this photograph. Either way, if bulbuls are at all similar to most passerine birds, the saturation of pigment in the mouths of nestlings is related to blood supply, which itself is linked to digestion, providing a system whereby the visiting adult can assess the relative hunger of the chicks.*

[*Phyllastrephus flavostriatus flavostriatus*, Mutate area, Zimbabwe. Photos: Geoff McIlleron]



*The **Red-whiskered Bulbul**, in common with several congeners, is often found nesting in odd situations. Natural sites tend to be in shrubs, creepers or trees, including dense-foliaged exotic conifers, as well as bamboo and mangroves. But in towns and villages it often places its nest in man-made situations, including in trellises, baskets, roof thatching, stacks of straw, in pot-plants standing on verandahs, and even down wells. Like most bulbuls with largely frugivorous diets, the adults feed the nestlings copious amounts of fruit when fledging draws near. At this stage parental visits to the nest are very frequent, and fruit, being much easier to locate and collect than insects, provides an important supply of food. Partly because bulbul nests are large and poorly concealed, and partly because adult birds are not particularly circumspect in their vicinity, they seem to suffer inordinately high predation rates. In most studies of pycnonotids the number of eggs producing fledglings is around 10%. Eggs and chicks are usually taken by birds such as corvids, as well as lizards, snakes and monkeys.*

[*Pycnonotus jocosus*. Photo: Vivek Sinha/SAL/ Oxford Scientific Films]



At most bulbul nests, including those of the ***Sombre Greenbul****, both parents feed the nestlings. The task of brooding chicks in this species seems to vary, however, with females taking the responsibility at some nests, but males sharing this duty at others. The length of the fledging period is highly variable too, with some broods fledging 10·5 days after hatching, and others remaining in the nest for 16 days. In one study an average of 1·73 chicks fledged per successful nest.*

[*Andropadus importunus importunus*, Kirstenbosch, Cape Town, South Africa. Photo: David Steele/ Photo Access]

evations over this period. There is a record of the Eastern Mountain Greenbul from the edge of Lake Malawi, over 30 km from the nearest montane forest, and, even more remarkably, a Stripe-cheeked Greenbul was caught in a mist-net in the Pugu Hills of coastal Tanzania, over 200 km from the species' nearest known breeding population. Although such records are undoubtedly exceptional, results from ringing studies do indicate that these species will move between forest patches several kilometres apart. Yellow-streaked Greenbuls, in the genus *Phyllastrephus*, undertake similar movements between forest patches in Malawi, while the Reunion Black Bulbul perfoms a seasonal altitudinal migration, moving to lower elevations during the non-breeding season, possibly in response to decreased food supply in upland indigenous forests during the austral winter.

Several subspecies of the Himalayan Black Bulbul are fully migratory, and there is a huge passage through parts of South-east Asia of individuals moving from breeding grounds in China to spend the northern winter in Myanmar and Indochina. The passage through Hong Kong is interesting in its timing. The vast majority of sightings occur between early February and mid-April but few migrants are seen in autumn, suggesting that different routes are used in the two seasons. During this spring period, the passage is irregular and depends upon weather conditions, with big influxes on some days and none on others. The tendency for long-distance migrations and vagrancy within *Hypsipetes* explains the colonization of remote oceanic islands by members of this group.

With regard to the issue of vagrancy, a degree of caution is required. This is because many pycnonotids are widely held in captivity (see Relationship with Man), a fact which causes repeated problems for ornithologists when assessing records of potential vagrants. Red-whiskered Bulbuls at Beijing, in east China, Black-capped Bulbuls in Singapore and Sooty-headed Bulbuls (*Pycnonotus aurigaster*) in north Sulawesi are just three examples of what are believed to have been escapees from captivity.

Relationship with Man

Bulbuls, at least those in the genera *Pycnonotus* and *Alophoixus*, receive for the most part a remarkably consistent press across their ranges. The same adjectives crop up repeatedly; they are described as jaunty, vivacious, cheerful, cheeky, sprightly, lively, brash, self-confident, bold, frolicsome, and cheery. This is due to their ubiquity and familiarity across rural, suburban and urban environments, their confiding, energetic and pugnacious behaviour, and their persistent, penetrating vocalizations. Nevertheless, their voices can become wearing: according to E. S. Wilkinson, the song of the bulbul is "monotonous through lack of variety… acquiring merit only by its spontaneous cheerfulness", while Moreau found that, although the song varied somewhat by locality, "the same bird is liable to indulge in wearisome iteration". On the other hand, V. Legge stated that the Red-vented Bulbul in Sri Lanka was a universal favourite among Europeans, many of whom rated its singing so highly that they referred to it as the "Ceylon Nightingale".

Two further quotations round out the picture. Thus, of the Himalayan Bulbul in Kashmir, H. Whistler wrote: "with its bright cheeky behaviour, quaintly cocked crest, and pleasant notes, it is a universal favourite, catching the eye even of the most unobservant, as it enters boats and houses, or hops about the feet of picnic parties in search of stray scraps and greedily eating bread and cake thrown to it." With equal enthusiasm, G. L. Bates summed up the Common Bulbul in West Africa as follows: "its great success in life—for it is absolutely the commonest good-sized, non-gregarious bird—is due to brains and adaptability. The notion of its intelligence given by its twinkling black eye is not fanciful, but is supported by a serious study of its ways and methods, which are more various than those of most birds; one mark of intelligence is its confidence in man." Although one may demur as to whether confidence in man is really a sound measure of intelligence, the point is made that these birds are well known and, for the most part, admired across much of Africa and Asia.

This appears not to be a new phenomenon. Pycnonotids are such a familiar part of the Asian environment that the word "bulbul" is mentioned widely in Asian, and particularly Persian, poetry. In this context, a caged bulbul may be used to serve as a metaphor for being held captive or for conscience. The term "bulbul" is also often applied directly to poets and singers in Iran and elsewhere. There is, however, some confusion as to which bird is actually meant, since the word "bulbul" is often



*In the **Yellow-vented Bulbul**, fledglings can feed independently four days after leaving the nest, but they are usually fed by adults, at least occasionally, for up to a month. Most bulbuls are fully independent 40–50 days after leaving the nest, by which time they are often chased off the natal territory by the adults. The period of post-fledging care tends to be longer in insectivorous forest-dwelling bulbuls. Young of these species are often fed for up to 10 weeks by adults, probably because of the general scarcity of invertebrate food and the longer training period necessary to acquire the appropriate foraging skills.*

[*Pycnonotus goiavier analis*, Singapore. Photo: Morten Strange]

translated as "nightingale" and may, therefore, not relate to Pycnonotidae. What is certain is the use of illustrations of Brown-eared Bulbuls in Japanese fine arts, such as colour woodblock prints and fan paintings.

The cagebird trade in Asia is a serious issue, and one which may be driving a few species, such as the Straw-headed Bulbul, towards extinction (see Status and Conservation). In Vietnam, Red-whiskered, Black-capped, Sooty-headed and Streak-eared Bulbuls have recently been found in trade in fairly large numbers in Ho Chi Minh City and Hanoi. The numbers seen there, however, were far outweighed by the 6889 Red-whiskered Bulbuls counted in the late 1980s at the Bangkok weekend market, where this species represented 10% of the total birds and was the second most commonly encountered species.

Among birds seen in the Calcutta market, in India, the Red-vented Bulbul was by far the most common, perhaps because of the tradition of bulbul-fighting. With reference to this species, F. Finn stated: "it is not so often caged, however, as tethered to an iron T-shaped perch padded with cloth, the cord being fastened to a soft string round its body. This is to further its employment as a fighting bird, that being the purpose for which it is commonly kept. Two individuals are made hungry, and then their jealousy is excited by offering food to one only, which of course provokes a fight." Thus induced into battle, the Red-vented Bulbuls flapped at each other and pulled out feathers in rather dramatic fashion, while bets were placed on which bird would be the "winner". According to Finn, the sport was popular in winter, after which the birds were released, "with the exception of such as have proved worthy of maintenance for the future".

It seems that this practice was widespread in India, and probably also in neighbouring Bangladesh. In the 1880s, G. Reid wrote that, in Lucknow, the species "is prized by the natives for its fighting qualities" and "trained for the same purpose"; he added that he had seen in the courtyards of country magnates as many as a hundred perched on, and fastened to, separate sticks shaped like the letter "T". Ali and Ripley, referring to the same species give the following account:

> "Before the law prohibiting animal fights came into force, these bulbuls were trained for fighting in some provinces. They were fed a special diet to produce extra courage and pugnacity. The two adversaries were placed facing each other on T-shaped perches, at a distance calculated to allow the most powerful blows. The birds were tethered by a cord fastened to a soft string round the body [*pēti*, or 'braces'], 'this fact transforming the fight to a duel "to the finish". In the meantime spectators placed heavy bets'... Notwithstanding the ban, bulbul fighting still continues as a popular rural sport at fairs and on high days and holidays in some parts of the country. Considerable sums change hands over the mains, and champion birds fetch high prices."

Apparently, this was the only species in the sprawling Calcutta market utilized in such a way, although several other pycnonotids offered for sale included the Red-whiskered and Black-crested Bulbuls, irregular but sometimes considerable numbers of White-eared and Himalayan Bulbuls, and also, from farther afield, the Light-vented Bulbul. In addition, Ashy Bulbuls, Mountain Bulbuls (*Ixos mcclellandii*) and Himalayan Black Bulbuls were sometimes brought to Calcutta during the winter. The fact that this information derives from 1902 reveals the extent to which bulbul-trafficking over considerable distances has been an important factor for more than a century. Moreover, the trade was not restricted to India. In Pakistani bazaars, captured Himalayan Bulbuls or associated hybrids were tied to perches and sold. They were caught in traps baited with white ants, which they were said to be "unable to resist". In Sri Lanka, Red-vented Bulbuls are still a favourite pet, in part because they are so easily habituated to people. They are usually kept caged, but become so tame that they allow themselves to be carried around perched on a shoulder or hand.

The commercial use of bulbuls has taken a different turn in South-east Asia. In south Thailand, at least, the popularity of pitting caged bulbuls against each other in song-contests has taken off in recent years. Again, a lot of money changes hands, as the betting fraternity has become heavily involved and demand appears to be large. This has implications for conservation, as the Red-whiskered Bulbul, the favourite species, has now disappeared from much of Thailand, where it was formerly very common, through a combination of trapping for the cagebird trade and trapping for song-contests (see Status and Conservation). The situation is exacerbated by the fact that this bulbul is difficult to breed

in captivity, and wild individuals are preferred over captive-bred ones as they are believed to have a richer song.

Finally, throughout South-east Asia, bulbuls are often sold as religious gifts: caged individuals are among the birds most frequently released during Buddhist festivals, or as symbolic offerings by pilgrims at shrines and temples. Although these birds are not permanently removed from the wild, they are often translocated from their natural range. As a result, this tradition causes repeated problems in the assessment of records of potential vagrants (see Movements) and can result in changes in distribution (see Status and Conservation). In extreme cases, extralimital populations sometimes become established around major Buddhist shrines where the release of cagebirds is a regular event; in Malaysia, for example, a population of Red-whiskered Bulbuls has become established around the Kek Lock Tong caves, in Perak.

In contrast to the situation in Asia, the cagebird trade in bulbuls in Africa and the western Indian Ocean islands is virtually non-existent and, with one exception, it is certainly not thought to be on a scale large enough to pose a threat to any species. The exception is that of the Reunion Black Bulbul, which, although once considered "extraordinarily abundant", is now uncommon, largely as a result of hunting. Although hunting, formerly legal, is now prohibited, and this species' numbers are thought to be increasing in consequence, the biggest constraint to its recovery is the illegal capture of birds for the local cagebird trade, where its abilities as a songster are much appreciated.

In the early nineteenth century, the Reunion Black Bulbul was so numerous that it could be relied upon to provide an expedition to remoter parts of the island with its meat ration, since it was "so abundant, tame and inquisitive that a few minutes work with a baton would easily supply the day's need". Hunting of Reunion Black and Mauritius Black Bulbuls, much appreciated for their culinary value, was a long-standing tradition on both islands, but it is now illegal, although only since 1989 on Reunion. Both species have suffered catastrophic declines in historical times, a result primarily of a combination of hunting and habitat destruction (see Status and Conservation).

Across Asia, bulbuls are trapped or killed for food using a variety of ingenious techniques. In the Philippines, they continue to be caught in light-traps set at night to lure migrant birds at Dalton Pass, Luzon. Yellow-vented Bulbuls and Philippine Bulbuls (*Ixos philippinus*) are taken, along with other birds, which are then sold on to food markets. Bulbuls are also caught for food in parts of India, including Assam, where hunters use a *Forâla*, a glue-tipped pole baited with a live termite, to catch Red-vented Bulbuls, among many other passerines. Hunting of Black-crested Bulbuls around Yangon, Myanmar, was noted in the late 19th century to involve firing mud bullets from a bamboo bow. In Laos, too, pycnonotids are a prize target; Mountain Bulbuls, for example, are mostly quite tame and easily killed in remote regions, where they tend not to fly away when shot at. Bundles of bulbuls, mixed in with other passerines and tied together with string or strips of bamboo bark through their nostrils, end up in little piles at open-air markets.

One group of people to whom bulbuls do not endear themselves are orchard-owners and other farmers. In Japan, for instance, Brown-eared Bulbuls are considered to come second only to crows in the amount of crop damage that they cause, particularly to citrus fruits, especially oranges, but also, more recently, to various kinds of leaf vegetables during the winter. This novel food source for this species appears to have prompted a change in behaviour by at least part of the population; since the 1970s, rather than migrating to the southern part of Japan, Brown-eared Bulbuls have started to remain on their northern breeding grounds during the winter, at the expense of winter cabbage and other leaf vegetables. A further instance of exploitation of a new food source in that country is provided by the Light-vented Bulbul, which first appeared in Okinawa in the 1970s and began to eat the leaves and fruit of vegetables. It has increased in numbers and is now considered a major threat to crop productivity. In China, this species causes a great deal of damage to strawberries and tomatoes in suburban gardens.

Other examples of bulbuls as crop pests include the Red-whiskered Bulbul, which can cause serious damage to buds and ripening fruit in Indian orchards and which takes flower buds and seedlings from gardens. It also loves *Lantana* fruit, and in north Thailand is implicated in the dramatic and damaging spread of this introduced weed. Likewise, the Red-vented Bulbul is known to damage fruit, flowers and peas. In Pakistan, it is a serious pest in fruit orchards, in particular of persimmons (*Diospyros kaki*) and guava (*Psidium guajava*), and it also causes damage in citrus orchards, both orange and grapefruit, after parakeets have initiated the process by piercing the skin of the fruit. This species is implicated in spreading *Lantana* around Sri Lanka in the 1800s. In India, it is "very destructive to peas, strawberries, brazil-cherries (*Physalis peruviana*), and other soft fruit". Himalayan Bulbuls have been known to devastate crops of peas, currants, raspberries and other domestic foods in Kashmir, while Yellow-vented Bulbuls are reported as doing a "good deal of damage" to pepper crops in Borneo.

The White-eyed Bulbul is another species which has adapted well to novel food sources. Indeed, it has, since the 1930s, been able to expand its range significantly in some areas as a consequence of the spread of human settlements and the cultivation of fruit crops into desert areas. It is regarded as an agricultural pest in some places, and may be killed legally in Israel. The Common Bulbul exhibited a similar range expansion during the twentieth century in Egypt, where it is sometimes killed as a pest in fruit orchards.

Nevertheless, the culpability of pycnonotids as crop pests needs to be balanced against their beneficial effects in gardens and cultivated land. Although these are less well understood and documented, bulbuls are also active pollinators and seed-disseminators, as well as playing a role in controlling populations of more damaging agricultural pests, such as caterpillars.



*The **Grey-bellied Bulbul**, one of the more attractive members of the family, is restricted to humid forests in the Malay Peninsula and the islands of Sumatra and Borneo. It is not a rare bird, but the scale of habitat destruction in the Sundaic lowlands over the last few decades means that its population must have been declining at a phenomenal rate, almost fast enough for it to qualify as a threatened species according to IUCN criteria. For this reason it was treated as Near-threatened in the latest Asian Red Data Book.*

[*Pycnonotus cyaniventris cyaniventris*, Panti Forest Reserve, Malaysia. Photo: Jimmy Chew]

Status and Conservation

In general, the Pycnonotidae either are birds of open habitats or are resilient to forest degradation. In a study of primary and logged forest in Malaysia, A. D. Johns found that bulbuls did not drop out of logged habitats, and, indeed, several species increased after logging. Analyses in Africa have produced similar findings for many, but not all, species. The reason for this is partly that many bulbuls eat small berries, and the types of plant producing this resource often thrive in opened-up habitat. Some are also



*The **Yellow-eared Bulbul** is yet another abnormal* Pycnonotus *bulbul, previously placed in the monotypic genus* Kelaartia*, which may deserve resurrection. Two prominent features, its face-pattern and its voice, seem especially divergent. It is endemic to the uplands of Sri Lanka, where it is usually common in forest and associated secondary growth and thickets. Given the limited extent of its range, and the ongoing clearance of Sri Lanka's forests to supply the timber trade, or to make way for agricultural expansion and urbanization, it is classified as Near-threatened.*

[*Pycnonotus penicillatus*, Sri Lanka. Photo: Greg & Yvonne Dean]

generalists, able to switch between an insect-based diet and a fruit-based one according to conditions. This gives them much more ecological flexibility than is possessed by many species in other groups. Some African bulbuls, particularly insectivorous ones, however, have more specialized dietary requirements and foraging strategies that render them unable to cope with severe habitat degradation. Nonetheless, it remains perhaps somewhat surprising that 13 bulbul species, almost 10% of the family, are currently considered at risk of global extinction according to IUCN criteria.

The Straw-headed Bulbul, classified as Vulnerable, was once a common and widespread bird, but it has suffered catastrophic declines in its population and contractions in its range. This is principally because of the rampant cagebird trade in South-east Asia (see Relationship with Man), particularly in Indonesia. The species has been extirpated in Java, and numbers in Myanmar, Thailand, Sumatra and Kalimantan are now extremely low. The stronghold is Malaysia, where reasonable populations survive in protected areas such as those at Taman Negara and the Danum Valley. It is not found in tall rainforest, preferring instead the second-growth and shrubby habitat fringing lowland rivers. While there has undoubtedly been a problem of loss of riverine habitat, the species is tolerant of a fair degree of habitat degradation. Its absence from numerous apparently suitable sites is the result of extreme trapping pressure. This bulbul is a very popular cagebird because of its powerful and melodious song (see Voice). It is still commonly traded in bird markets in Bangkok, Thailand, and Jakarta, Java, but most of the individuals which continue to fuel this trade are trapped in and around their remaining Malaysian strongholds. Strict legal protection of this species is clearly vital if it is to survive this pressure. Protected areas require constant surveillance and patrolling if they are to repel the frequent visits of the trappers, who visit even the most remote localities. One result of the trade in Straw-headed Bulbuls is the establishment of a small population on Pulau Ubin and elsewhere in Singapore, founded by escaped captives. This is one of the only populations of the species that has been expanding of late.

Styan's Bulbul (*Pycnonotus taivanus*), also Vulnerable, presents another interesting case. The threats to it are, however, more to do with genetic interference than with habitat loss. Although native habitat in its range is being degraded, this is not, in itself, a problem, since Styan's Bulbul generally prefers secondary and shrubby vegetation. Nevertheless, partly as a consequence of habitat alteration, the ranges of this species and of the closely related Light-vented Bulbul now overlap in several areas, and the two species hybridize readily. Genetically pure Styan's Bulbuls are retreating in range, and are now found only in the coastal mountains of south-east Taiwan. The spread of hybrids has been accelerated by the release of large numbers of captive bulbuls for religious purposes (see Relationship with Man). This has created new epicentres of hybridization. There is, therefore, a real danger that the pure strain of Styan's Bulbul may disappear as a result of genetic swamping by the Light-vented Bulbul. This problem should be countered by the control of releases, and possibly by culling the Light-vented Bulbul population in overlap zones. Even so, the matter is a very difficult one to address. The possibility of establishing a refuge with a buffer zone, from which all Light-vented Bulbul types are removed, has been proposed.



*The **Scaly-breasted Bulbul** is treated as Near-threatened because it is restricted to the vanishing forests of the Sundaic region. In Malaysia and Sumatra, however, it remains moderately common, at least on humid submontane slopes where forest cover is relatively extensive. This is fortunate as it is perhaps the most beautiful bulbul, a little gem in a family famed for dreary plumage. Small groups forage actively in the canopy, sometimes accompanying mixed-species flocks, their plumage and behaviour often recalling tanagers (Thraupidae) in Andean cloudforests.*

[*Pycnonotus squamatus*, Hong Kong Park Aviary. Photo: Ray Tipper]



*The **Black-and-white Bulbul** is unusual in its plumage pattern and unpredictable movements. The male is mostly black but for a pair of strikingly white shoulders, while the female is duller and browner. It often appears in numbers at certain sites, stays for a few weeks or months, then disappears again. This nomadic tendency suggests some degree of specialization that probably renders it more susceptible to habitat fragmentation. This fact, and the rampant clearance of lowland forest in the Sundaic region, justifies its allocation to the Near-threatened category.*

[*Pycnonotus melanoleucos*, Crocker Range National Park, Sabah, Borneo. Photo: Doug Wechsler/ VIREO]

Although common at some sites in south-central India, the Yellow-throated Bulbul is extremely local and occurs in very few protected areas. It is thought to be declining, as its habitat is being cleared in many areas; this habitat loss is due to quarrying for granite, grazing, the collecting of wood for fuel, and agricultural expansion. Although the species is protected within Mudumalai and Sri Venkateshwara Wildlife Sanctuaries, further surveys are needed in order to attempt to clarify its full distributional range, and key sites should be given official protection. This bulbul, too, is placed in the conservation category of Vulnerable.

Naturally confined to a small area of the Albertine Rift region of DRCongo, Prigogine's Greenbul (*Chlorocichla prigoginei*) is listed as Endangered. This is because it is estimated to have a range of only 870 km² and is restricted to mid-altitude forest which is under particularly intense pressure for conversion to agricultural land and local logging. Human population pressures in the two areas in which the bird is known, north-west of Lake Edward and on the Lendu Plateau, are extremely intense; in fact, almost all forest on Lendu has been cleared. Information is, however, scanty owing to the continuing political unrest in the region. The prospects for Prigogine's Greenbul do not seem rosy. One hope is that it may yet be found to occur in other remaining forests in this poorly known region.

The mysterious Liberian Greenbul is one of three globally threatened pycnonotids confined to the Upper Guinea forests of West Africa. It is the only bulbul currently listed as Critical, this being attributable to its tiny range, confined to the type locality, in an area known to be subject to logging and clearance for subsistence agriculture. The security situation in the region has prevented research or conservation effort but is known to have exacerbated the short-term exploitation of the forests on which the greenbul depends. The taxonomic status of this species, however, is not established unequivocally, and the possibility remains that it is an aberrant form of the much more widespread and common Icterine Greenbul (see Systematics). Resolution of this issue is an important conservation priority.

Both of the other two threatened Upper Guinea bulbuls, the Green-tailed Bristlebill and the Yellow-bearded Greenbul, are much more widely distributed within West African forests, having similar ranges from south-east Sierra Leone east to south-west Ghana. That they are categorized as Vulnerable reflects the rampant deforestation to which this region is subject. A combination of commercial logging and agricultural intensification by the growing human population has meant that remaining forests are becoming increasingly fragmented and threatened. On a more positive note, however, following extensive survey work in the region and as a consequence of a better appreciation of their diagnostic characters, both species have been found in more of the remaining forest reserves than was originally suspected. Both are also known to be present in a number of national parks and other protected areas in the region, although, in many cases, these areas are at risk from a mixture of political instability, ineffective implementation of legal protection and chronic encroachment. Moreover, the presence of these species in forest reserves is, in any case, no guarantee of protection, since many such reserves are "production" forests, scheduled for varying degrees of exploitation in the future.

The Hook-billed Bulbul (*Setornis criniger*) is locally fairly common in Borneo, but scarce in Sumatra. Massive rates of deforestation and forest fires have, in recent years, reduced the total area of peatswamp-forest and *kerangas* (heath-forest), the principal habitats of this species. In Borneo, it is fairly common in Tanjung Puting National Park, in Kalimantan, and scarce at Danum Valley, in Sabah, and Gunung Mulu and Similajau National Parks, in Sarawak. Continued protection of these areas is essential, as is a higher profile for the conservation of peatswamp-forest and *kerangas* in the Sundaic region. Given the paucity of distributional information about this bulbul, further surveys are needed to attempt to clarify its status and distribution in more remote regions of Sumatra and Borneo. It is listed as Vulnerable.

Formerly common, the Nicobar Bulbul, too, is now classified as Vulnerable, following habitat destruction in its restricted range as a result of conversion to coconut plantations, expansion of human settlements and infrastructural development. A further threat is thought to come from competition with the introduced Red-whiskered Bulbul; the native Nicobar species seems to suffer wherever the introduced bulbul thrives (see below). The island of Tillanchong, just 17 km² in extent, is uninhabited and protected as a reserve. The largest numbers of Nicobar Bulbuls, however, have been seen on Katchall and Teressa Islands, and conservation action should be focused here. Control of the Red-whiskered Bulbul population should be considered.

Another member of the genus *Ixos*, the Streak-breasted Bulbul, is considered Endangered because of its very small, fragmented and declining range. It occurs on four islands of the Philippines: Tablas, Romblon, Siquijor and Cebu. Despite its tolerance of degraded habitats, it is threatened by deforestation. Indeed, it had been thought to be already extinct on Cebu, but a few recent

*One of the most poorly known of all bulbuls, **Finsch's Bulbul** is an inhabitant of dense Sundaic forests. It is currently grouped with* Alophoixus*, but seems rather divergent, and possibly deserves re-allocation to a monotypic genus. Although apparently scarce, it is difficult to assess to what extent this impression is exaggerated by its dull plumage, lack of notable song and retiring habits, all of which make it easy to overlook. Along with many sympatric species, it is classified as Near-threatened due to the catastrophic loss of lowland forest in south Thailand, Malaysia and west Indonesia.*

[*Alophoixus finschii*, Panti Forest Reserve, Malaysia. Photo: Ong Kiem Sian]



sightings in or near the Tabunan Reserve give cause for hope. Little suitable habitat remains on Tablas and Romblon, and the largest surviving population is on Siquijor, where a population of several thousand individuals is thought to be present. Protection of the remaining habitat on all islands is urgent, not least because the subspecies on Tablas and Romblon, *cinereiceps*, may merit treatment as a separate species (see Systematics).

Also an island inhabitant, the Mauritius Black Bulbul is currently listed as Vulnerable. Once one of the island's most widespread and common endemic birds, it has become confined to a very limited area of Mauritius, with a population estimated in 1993 to number about 280 pairs. The decline in its fortunes is due primarily to habitat destruction; this pycnonotid is largely reliant on native vegetation, as the invasive exotics do not provide the fruit or insects on which it depends for food. In addition to the loss of natural forest, nest predation by introduced mammals such as rats and crab-eating macaques (*Macaca fascicularis*), coupled with competition from introduced Red-whiskered Bulbuls and Common Mynas (*Acridotheres tristris*), appear to be restricting the bulbul's population. Mauritius Black Bulbuls occur in Black River Gorges National Park, but this covers only part of the species' current range, and some areas of remaining critical habitat are not included in any protected area. The rehabilitation of native ecosystems in Conservation Management Areas, including the exclusion of introduced animals and the removal of exotic vegetation, offers hope in the longer term. Other conservation initiatives being considered are the eventual translocation of some native bulbuls to neighbouring islets once the latter have been restored. There are plans for trial translocations of captive-reared individuals over the next few years.

Notwithstanding the fact that they have recently been shown not to be true bulbuls (see Systematics), two erstwhile members of the genus *Phyllastrephus* from Madagascar certainly merit their classification as globally threatened. Both are listed as Vulnerable. The Dusky Tetraka (*Xanthomixis tenebrosus*) is a puzzle. With the recent rediscovery of the Sakalava Rail (*Amaurornis olivieri*), this tetraka remains perhaps the least known of Madagascar's extant bird species. This is partly a consequence of misidentification; it has in the past been confused with other species because of a lack of appreciation of the characters by which it can be identified in the field. Although this is still true to a degree, it has recently been demonstrated that this tetraka is more distinctive than was hitherto appreciated, which, in turn, means that there has to be some uncertainty regarding a number of earlier, unsubstantiated field records. The species must, however, be rare and local, since many recent surveys across a large part of its potential range have drawn a blank. The Dusky Tetraka appears to be an inhabitant of undisturbed lowland and mid-altitude forest, with confirmed records, such as specimens, only from a limited area of north-east Madagascar. The remaining forests of this region are threatened by clearance for cultivation by subsistence farmers, resulting in increasing fragmentation and progressively more degraded regrowth. The few recent confirmed records have come from the protected areas of Marojejy and Zahamena National Parks, but further fieldwork to locate other populations, and to develop a fuller understanding of the species' habitat requirements and other factors limiting its population and distribution, is urgently needed.

The other globally threatened Malagasy species, Appert's Tetraka (*Xanthomixis apperti*), was not described until 1972 and has an extremely localized distribution in south-west Madagascar. Its population is estimated to number fewer than 2500 individuals, confined to Zombitse–Vohibasia National Park and, some 50 km to the west of there, the Analavelona forest. Zombitse and Vohibasia forests were threatened mainly by clearance for maize (*Zea*) cultivation and charcoal production but, thanks to conservation efforts, including the creation of the national park, there has been no further clearance for several years. Analavelona forest is not managed for conservation, but it is relatively isolated and clearance is not thought to be an imminent threat.

In addition to the 13 globally threatened species mentioned in the preceding paragraphs, 14 pynonotids, a further 10% of the family's members, are currently considered Near-threatened. Ten of these are Asian species: Finsch's Bulbul, the Buff-vented Bulbul (*Iole olivacea*), two species of *Ixos* and six species of *Pycnonotus*. Several of these are still common birds, but are thought to be at risk because of their restriction to low altitudes in the Sundaic region, where forest loss is occurring at a very rapid pace, and where population declines must consequently be steep. In Africa, the Cameroon Montane Bulbul and two *Phyllastrephus* greenbuls are Near-threatened, and the Grey-crowned Tetraka of Madagascar is included in the same conservation category. Almost all of these pycnonotids have suffered habitat loss, in some cases extensively so, and it is important that their populations be monitored.

Baumann's Greenbul is a very poorly known species, currently placed in the category of Data-deficient. It has been found at some 30 localities in its West African range, and appears to be



Many bulbuls in Africa and Asia are abundant and conspicuous as a result of their versatility and opportunism. It is perhaps surprising, therefore, that 13 species, almost 10% of the family, are considered at risk of global extinction. One of these is ***Appert's Tetraka****, a Madagascan endemic, which is thought to number fewer than 2500 birds. All are found in two protected areas: Zombitse-Vohibasia National Park and the Analavelona forest. Until recently these vital fragments were being whittled away by clearance and charcoal production, but conservation efforts seem to have slowed this process.*

[*Xanthomixis apperti*, Zombitse-Vohibasia National Park, Madagascar. Photo: Brenda Holcombe/ Windrush]



*The **Straw-headed Bulbul** is a remarkable bulbul on account of a suite of unique features, amongst which can be listed the tough carpet of bristle-like feathers on its forehead, the large size, and the phenomenally powerful and melodious song. Sadly, these features make it a popular cagebird in South-east Asia, and it is mercilessly trapped as a result. Once common and widespread, it has disappeared from Java and probably Myanmar, while populations in Thailand, Sumatra and much of Borneo are now dangerously small. It is listed as Vulnerable, and requires a concerted programme of conservation action to address the threat of excessive trapping.*

[*Pycnonotus zeylanicus*, Bukit Batok Nature Park, Singapore. Photo: Jimmy Chew]

rare. Because of its skulking behaviour, its lack of distinctive field characters, and its frequent occurrence in degraded habitats, however, it is often overlooked or misidentified. Moreover, the literature contains information based on incorrect field identification, thereby confusing the situation. Bearing in mind its habitat requirements, this greenbul is thought likely to be more common and widespread than records suggest.

Mention should also be made of another poorly known species, the Blue-wattled Bulbul, also classified as Data-deficient. This is known from only two specimens, the first collected in 1901 at about 500 m on the upper Kayan River, in Kalimantan, and the second taken in northern Sumatra in 1939, and described as a separate race. The only recent reports involve a series of five sightings in 1992 at Kuala Belalong Field Studies Center, in Brunei. This bird is an enigma if ever there was one. Either it is extremely rare and thinly distributed over a wide range, or it is a strange morph or even a hybrid. The evidence for its being a morph is very slender, as it does not look like any other species in its range, differing in shape and in having a bright swollen eyering. The evidence for hybrid status is equivocal (see Systematics). It could be a habitat specialist restricted mainly to a habitat type infrequently visited by ornithologists, or perhaps it may be simply overlooked because it is relatively inconspicuous. In view of the number of observers visiting some lowland-forest sites in Sumatra and Borneo, it seems unlikely that this bulbul, if it does indeed occur at those sites, would be overlooked. The possibility that it may be a habitat specialist is tempting, but this idea loses ground when one considers that the Sumatran specimen was found in shrubs on a river island, while the recent Brunei records were mostly in the canopy of undisturbed rainforest. These observations do not point towards specialization. So little is known about this pycnonotid that nothing more can be said about it at present. Fieldwork is the most important requirement if this elusive bird is to be tracked down and its true identity unmasked.

One of several consequences of the cagebird trade (see Relationship with Man) is that it can lead to changes in a species' distribution. Many bulbuls, having escaped or been released from captivity, have established thriving extralimital colonies as far afield as Miami, in the south-east United States, Hawaii, Polynesia, Mauritius and Australia. A good example of shifting distribution resulting from the cagebird trade is provided by the Red-whiskered Bulbul. In Thailand and north Peninsular Malaysia, part of its natural range, this was once one of the commonest open-country bird species, but it is now virtually extinct in most of this region, the victim everywhere of excessive trapping. Perhaps the healthiest population in the Malay Peninsula is now the small one in Singapore, far outside the species' natural range; first reported in 1925, this was founded by escapees.

Bulbuls fare well in new environments because they are such opportunistic generalists. This is well illustrated, for example, by the success of the Red-whiskered Bulbul around the Indian Ocean. In the Mascarene Islands, the recent introduction of this species has been followed by a very rapid expansion of the population. The same species was released on the Nicobars in the 1870s, when W. Davison found a small party of them on the island of Camorta shortly after the first release. He commented that they were "probably those sent there from the Andamans by Mr. Homfray; they were in the cotton field and had apparently made themselves quite at home." He added that, on 16th January, eight or ten Red-whiskered Bulbuls were released in the village of Orong, on Car Nicobar, and that when he saw them several hours afterwards "they seemed to have taken quite kindly to the place, and were looking for insects in the brushwood bordering the jungle". These introductions resulted in the Red-whiskered Bulbul invading many of the Nicobar islands, much to the detriment of the endemic Nicobar Bulbul, which is now much rarer and, as mentioned above, is globally threatened. This illustrates how readily bulbuls can adapt to new environments, and the potential negative repercussions of allowing them to do so.

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PLATE 14

inches 4
cm 10

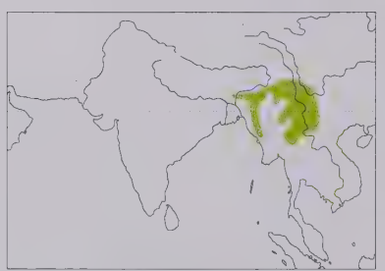
Genus *SPIZIXOS* Blyth, 1845

1. Crested Finchbill

Spizixos canifrons

French: Bulbul à gros bec **German**: Finkenbülbül **Spanish**: Bulbul Picogrueso
Other common names: (Crested) Finch-billed Bulbul

Taxonomy. *Sp[izixos]. canifrons* Blyth, 1845, Cherrapunji, Khasi Hills, Meghalaya, India.
Forms a superspecies with *S. semitorques*. Race *ingrami* only doubtfully distinct, as differences seem to fall entirely within range of variation of nominate; further research required to assess its validity. Proposed races *nobilis* (Assam, in NE India) and *laotianus* (Laos) considered too poorly differentiated to warrant recognition, and thus merged in, respectively, nominate and *ingrami*. Two subspecies provisionally recognized.
Subspecies and Distribution.
S. c. canifrons Blyth, 1845 – NE India (Assam, Meghalaya, Nagaland, Manipur, Mizoram, possibly also NE Arunachal Pradesh) and W Myanmar.
S. c. ingrami Bangs & J. C. Phillips, 1914 – E Myanmar, S China (SW Sichuan, N, W & S Yunnan), NW Thailand, N Laos and NW Vietnam (W Tonkin).
Descriptive notes. 19–22 cm; 44 g. Medium-large, noisy, conspicuous bulbul with short, conical bill. Most of head is dark grey, forehead pale grey, chin, throat, mask and rear crown blackish, some pale grey on lower face and ear-coverts,crown feathers elongated to form erect pointed jet-black crest; hindneck to uppertail-coverts olive-green; wings dusky olive, prominent yellow-green fringing on outer webs of remiges; tail similar, but with broad black terminal band; breast and flanks olive-green, becoming yellower on belly and undertail-coverts; iris dark brown to reddish-brown (hazel); bill pale yellowish-horn, black gape; legs pinkish or brownish-flesh, claws brown. Sexes similar, but female noticeably smaller than male, with duller black crest and mid-grey throat. Juvenile is much duller, with short crest, very weak head pattern (greenish-yellow forehead, pale brown ear-coverts, contrasting blackish-brown crown and nape, brown throat), pale yellow-tinged underparts with dark brownish-olive breastband, less distinct tailband; iris dull brown, bill pale fleshy or dusky, feet and toes horny flesh. Race *ingrami* supposedly has greyer throat and duller olive-green underparts than nominate. Voice. Dry, bubbling, trilled song described as "purr-purr-prruit-prruit-prruit", also a loud, full, sputtering series of harsh and guttural but somewhat musical "squirr ki-kirr-kirr-kirr" that rises distinctly and ends abruptly. Oft-given calls include bursts of gritty, powerful rattles comprised of short, upward-inflected buzzes, "grz-grz-grz"; similar but drier rattles may be merged with song elements.



Habitat. Open and stunted evergreen and deciduous forest, montane scrub, secondary growth and grasses; fond of clearings overgrown with bamboo and brambles (*Rubus*). Commonest at 1200–2500 m, but ranges to 4000 m in breeding season, and occasionally down to 900 m (once to 300 m) in winter.
Food and Feeding. Feeds on seeds (e.g. millet, grass), beans, peas, various types of fruit (e.g. *Leucospectrum* in Myanmar); also insects, including small beetles (Coleoptera), moths (Lepidoptera) and dipteran flies. Feeds at all levels; insects occasionally caught in flight. When not breeding forms monospecific flocks, sometimes containing 50–100 individuals, or mixed flocks with *S. semitorques* (S China, N Vietnam); has been recorded as joining other bulbuls to feed in fruiting fig trees (*Ficus*).
Breeding. Mar–Jul; most pairs in Chin Hills (NW Myanmar) had nestlings by late Apr. Apparently breeds co-operatively, although evidence rather scant. Nest a compact cup of strong fibres and a few elastic twigs, often without inner lining, fixed between several upright twigs, or lodged in stout fork, usually 1–3 m up in low bush (e.g. *Rubus*) or small tree, often in dense, low secondary growth; several nests in Chin Hills were made of corkscrew-like tendrils of a creeper plaited to-

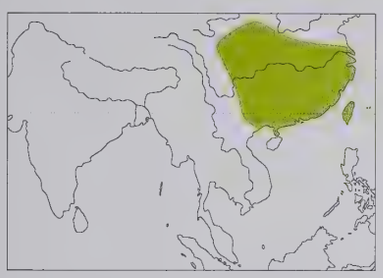
gether to form shallow saucer, most unlined, or lined with a trace of fluff or fine grass. Clutch 2–4 eggs, usually 2; no information on incubation and fledging periods.
Movements. Resident; does not usually descend to lower altitudes in harsh weather, but has been recorded down to 300 m in cold season.
Status and Conservation. Not globally threatened. Fairly common in highlands of Myanmar and N Thailand, but scarce in China. Nominate race possibly occurs also in SE Bangladesh (reported from Chittagong Hills, but no definite records). Much of its range is difficult of access, and overall population must be large and relatively secure. This is one of few montane Asian species to benefit from slash-and-burn agriculture, as this promotes its favoured scrubby habitat. It is a popular cagebird, but constant low-level extraction has not reduced its population. Can be a pest in montane gardens, where flocks can damage crops such as peas etc.
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2. Collared Finchbill

Spizixos semitorques

French: Bulbul à semi-collier **German**: Halsbandbülbül **Spanish**: Bulbul Collarejo
Other common names: Swinhoe's Finch-billed Bulbul, Black-headed/Chinese Finchbill

Taxonomy. *Spizixos semitorques* Swinhoe, 1861, Minhou, Fujian, south-east China.
Forms a superspecies with *S. canifrons*. Two subspecies recognized.
Subspecies and Distribution.
S. s. semitorques Swinhoe, 1861 – C, S & SE China and N Vietnam (locally W & E Tonkin).
S. s. cinereicapillus Swinhoe, 1871 – Taiwan.



Descriptive notes. 21–23 cm. Nominate race has head mostly blackish-grey, blackest on forecrown and forehead, with white supraloral spot, white streaks on ear-coverts; white sides of nape forming half-collar, otherwise nape and extreme upper mantle grey; rest of upperparts olive-green, yellower on wings and tail, latter with broad blackish subterminal bar; whitish half-collar separates black throat from olive upper breast, this becoming flammulated with yellow on lower breast, and pure primrose yellow in centre of belly; iris blackish or reddish-brown; bill ivory or cream; legs pale brown or dark flesh. Differs from *S. canifrons* in lack of crest. Sexes similar, but female smaller than male. Juvenile has dark head markings replaced with mid-brown, ear-covert streaks less distinct, upperparts and wing-coverts darker. Race *cinereicapillus* is very like nominate, but crown, forehead and tail tip marginally paler, grey instead of black. Voice. Song (in China) a quick, steadily paced sequence of 3–6 trisyllables (first and last notes equal in pitch, middle note higher), sometimes terminating in double syllable, e.g. "chuwichu-chuwichu-chuwichu-chuwi"; during singing bouts, songs are given after brief pauses, usually 5–10 seconds. One call an upslurred rippling "wirrrrp", often in series, and merging into song phrases.
Habitat. Open woodland, second growth and scrub in montane regions, including brush-covered ravines and hillsides covered in swordgrass (*Brachiaria decumbens*); often found around habitations and at edge of larger towns. Seems commonest at 1200–1500 m, but ranges considerably lower and higher.
Food and Feeding. Known to eat both fruit and insects; stomachs of specimens contained a cicada (Cicadidae), "field-bugs" and some berry seeds. Noted as perching prominently on bare twigs protruding from shrubbery, dropping into dense cover when disturbed. Gathers in monospecific flocks, often of 20–30 individuals, outside breeding season; sometimes flocks with *S. canifrons* (S China, N Vietnam).
Breeding. Mar–Jul; in S China thought to nest relatively late, usually May onwards, and to have protracted breeding season; probably two broods. Nest of strips of bark, leaves and leaf skeletons, grasses and other pliable material, woven into compact, deep cup with strong walls, although described by some authors as flimsy and shallow; usually 0·5–3 m above ground in brambles (*Rubus*) or other low scrub, in bunch of swordgrass, or in low tree. Clutch 3–4 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Locally fairly common or even very common, especially in parts of Taiwan and S China. Tolerates highly man-modified environments and is therefore not under any immediate threat. Occurs in a variety of protected areas, including Wolong Giant Panda Reserve, in Sichuan (China).
Bibliography. Caldwell & Caldwell (1931), Chang James Wanfu (1993), Cheng Tsohsin (1987), Collar (2004c), Dickinson *et al.* (2002b), Étchécopar & Hüe (1983), Inskipp *et al.* (1996), Lewthwaite (1996), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Nguyen Cu *et al.* (2000), Robson (2000), Severinghaus (1978), Strange (2002), Swinhoe (1863), Traylor (1967), Tsai Hangyeh (1985), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002).

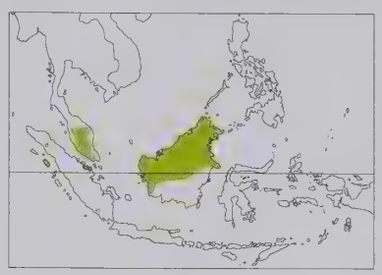
Genus *PYCNONOTUS* Boie, 1826

3. Straw-headed Bulbul

Pycnonotus zeylanicus

French: Bulbul à tête jaune **German**: Gelbscheitelbülbül **Spanish**: Bulbul Cabeciamarillo
Other common names: Straw-crowned/Yellow-crowned Bulbul

Taxonomy. [*Sturnus*] *zeylanicus* J. F. Gmelin, 1789, Sri Lanka; error = Java.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species was previously placed in monotypic genus *Trachycomus* (and for long known by synonym "*T. ochrocephalus*"); a return to its own genus perhaps justifiable on vocal, behavioural and morphological grounds. Monotypic.
Distribution. Peninsular Malaysia, Singapore, NW & SW Sumatra (including Nias I) and Borneo (except S).



Descriptive notes. 28–29 cm; 80–93 g. Large, noisy, uniquely patterned bulbul with robust bill, sturdy legs. Forehead, crown, lores and patch under eye are golden-yellow, offset by narrow blackish stripe from near nostrils back to (and protruding short distance behind) eye, and broad black submoustachial streak; feathers on forehead stiffened and brush-like, tinged tawny; nape, mantle and back brownish-grey, narrowly streaked ash-grey, and fringed greenish-brown (becoming greener towards rump); rump and uppertail-coverts dull olive-green with brighter olive fringing and tipping; wings and rounded tail brown on inner webs, olive-green on outer webs, with brighter fringes (rectrices tipped grey-white when fresh); chin, throat and breast whitish, breast heavily mottled greyish-brown with narrow white shaft streaks; rest of underparts more evenly sullied pale grey-brown, palest on mid-belly, thighs ashy-brown, undertail-coverts buff with yellow lateral fringing; iris red or chestnut; bill black; legs brownish-black, claws black. Sexes similar, female on average slightly smaller and may have duller, dark red-brown iris. Juvenile is duller, with less pronounced streaking, browner head, brown or light brown iris. Voice. Song frequently given, heard all year, powerful, mainly of repeated 2-note phrases producing rich, melodious, bubbling, rising and falling cadence, often sustained in antiphonal duet or chorus. Also semi-constant low gurgles or weak chattering when foraging and prior to roosting.
Habitat. Almost exclusively along banks of rivers and streams, usually where bordered by broadleaf evergreen forest and secondary growth; often found in low berry-bearing trees and shrubs overhanging water. Ventures less often into park-like habitat, scrub, mimosa (*Albizia*) plantations and cultivation, rarely into mangroves, and avoids continuous forest. Commonest in lowlands, to 240 m in Peninsular Malaysia, regularly (at least historically) to 1500 m in mid-montane forested ravines in Borneo (highest record 1800 m).
Food and Feeding. Diet primarily berries and other fruit, and seeds; also arthropods, some molluscs, occasionally small invertebrates. Eats figs (including *Ficus microcarpa* and *F. trichocarpa*), mistletoe berries (Loranthaceae), wild "cherry" (*Muntingia calabura*), and many other fruits; also small seeds and rush heads; in Singapore, visits the common exotic palm *Ptychosperma macarthurii*, taking nuts while hanging below, rather than perched on the fruit spike. Arthropods taken are spiders (Araneae) and a range of insects, including, among others, beetles (Coleoptera), both terrestrial and flying, bees (Hymenoptera), mantids, cockroaches (Blattodea), orthopterans. Known to eat molluscs (e.g. small riverine snails), and small vertebrates such as flying lizards (*Draco*). Items brought to nestlings and fledglings include, besides small unidentified fruit, spiders, caterpillars and stick-insects (Phasmida). Unlike many forest bulbuls, often feeds on the ground. Has been seen to catch large caddis flies (Trichoptera) in flight 2–3 m above water, and can catch slow-flying beetles in flight. Usually found in small family groups, often of 3–6 individuals (but regularly up to eight), from understorey to canopy.
Breeding. Usually breeds in Jan–Sept; in Peninsular Malaysia nest-building recorded Dec–Jul and laying in Jan–Jun and Aug; in Borneo, laying recorded Dec–Mar in Kelabit Highlands and eggs and young chicks in Nov and Aug in E Kalimantan. Extra-pair adults (helpers) sometimes feed fledglings, and at regular breeding site in Singapore a territorial group of four adults perched near nest with chicks (but number of individuals delivering food to nest not determined); these observations, and the fact that species often lives and sings throughout year in groups, indicate that cooperative breeding likely, but further research required to clarify breeding system. Nest a fairly large, shallow, untidy cup built from thin twigs, rootlets, grass and plant fibres, in Peninsular Malaysia lengths of fine creeper stalks and rhizomes of a small climbing fern (*Drymoglossum piloselloides*) often incorporated as binding and camouflage; nests found 1·5–6 m above ground, usually in branch fork of small tree along stream (sometimes overhanging water) or standing out from other vegetation in clearing or second growth, less often in low orchard or plantation tree, e.g. mango (*Mangifera*) or rubber (*Hevea*). Clutch 2 eggs; incubation and fledging periods unrecorded; nestlings and fledglings tended by both pair-members; fledged broods of two recorded.
Movements. Resident.
Status and Conservation. VULNERABLE. CITES II. Generally uncommon; very locally more common. Apparently extinct in S Myanmar, S Thailand and Java. A very popular cagebird in Indonesia and SE Asia, chiefly because of its rich and powerful voice. Intensive trapping the main threat, having eliminated this species from much of its range in recent decades; widespread habitat destruction along waterways a contributory factor, but it can tolerate moderate to heavy degradation where not persecuted. Was always marginal in Myanmar, where no recent records; has been rare in S Thailand for several decades owing to trapping, and presumed now extinct. Once abundant in Sumatra and E Java; after huge population crash, now rare and extremely local in Sumatra and extinct in Java. In Peninsular Malaysia, more or less common until 1990s, now irregular and uncommon to sparse throughout except in a few protected areas. Locally secure in Borneo (Sabah, Sarawak, Brunei and interior Kalimantan), but trapping pressure intense, at least in Kalimantan. Only in Singapore has status improved; was rare, if not extinct, on the main island by early 1980s, but ex-captives are prospering and expanding numbers in more or less secure parkland and in the increasing amounts of still suitable habitat held by the military; on Ubin I estimated 32 breeding pairs, at average density of 1 pair/32 ha, during May–July 2001. Because they are noisy inhabitants of linear habitat, breeders are easy to find and monitor; accessible rivers should be monitored where possible. This pycnonotid has strongholds in some large protected areas, including Taman Negara National Park, in Peninsular Malaysia, and Danum Valley Conservation Area, in Borneo (Sabah), and strict long-term protection of these sites is vital.
Bibliography. Batchelor (1959), Bennett *et al.* (1997), Berwick (1952), Büttikofer (1887), Chasen & Hoogerwerf (1941), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Davison (1987), Davison & Chew Yen Fook (1996), Dickinson *et al.* (2002b), Duckett (1985), Dutson (1990), Gibson-Hill (1949), Holmes (1994, 1996, 1997), Hoogerwerf (1969–1971), Hua Chew Ho (2001), Hume (1873d), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), Lim Boo Liat (1965), Lim

On following pages: 4. Striated Bulbul (*Pycnonotus striatus*); 5. Cream-striped Bulbul (*Pycnonotus leucogrammicus*); 6. Spot-necked Bulbul (*Pycnonotus tympanistrigus*); 7. Black-and-white Bulbul (*Pycnonotus melanoleucos*).

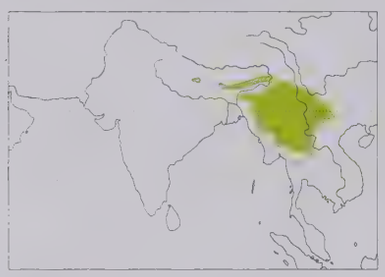
Kim Seng (1994a, 1994b), MacKinnon (1988), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), McClure (1961), Medway & Wells (1976), Ong Kiem Sian (2000), Riley (1938), Robinson & Kloss (1919b, 1924), Robson (2000), Round (1988), Smythies (1986, 1999), Stattersfield & Capper (2000), Tan (2002), Vowles & Vowles (1997), Wells (1990b, 2005), Wilkinson, Dutson, & Sheldon (1991), Wilkinson, Dutson, Sheldon *et al.* (1991).

4. Striated Bulbul

Pycnonotus striatus

French: Bulbul strié **German**: Streifenbülbül **Spanish**: Bulbul Estriado
Other common names: Striated Green Bulbul

Taxonomy. *Tricophorus striatus* Blyth, 1842, Darjeeling, West Bengal, India.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This aberrant species perhaps merits placement, along with *P. leucogrammicus*, in a separate genus, *Alcurus*. Validity of race *paulus* dubious, as features seem to fall within range of variation of nominate; further investigation required. Putative race *arctus* (NE India) lacks constant differences and is merged with nominate. Two subspecies provisionally recognized.
Subspecies and Distribution.
P. s. striatus (Blyth, 1842) – Himalayas in C Nepal, Bhutan and NE India (Uttar Pradesh, West Bengal, NE Arunachal Pradesh, hills of Meghalaya, Assam and Nagaland S to Mizoram).
P. s. paulus (Bangs & J. C. Phillips, 1914) – much of Myanmar (S to N Tenasserim), S China (Yunnan S of Likiang Range), mountains of W & N Thailand, N Laos and N Vietnam (W Tonkin).



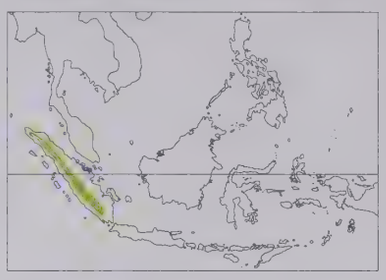
Descriptive notes. 21–23 cm; 45–60 g. A large, almost entirely streaked, rather long-tailed bulbul with long, tapered crest. Cheeks and crown are greenish-brown, finely streaked white (including on dusky-olive crest); mantle, rump and uppertail-coverts bright olive, streaked white; wings and tail rich olive-green, tail browner towards tip, outer rectrices with small yellowish-white tips; lores, eyering, throat and vent bright yellow, lower throat lightly spotted or stippled blackish; breast dark grey becoming dark olive-green on belly, all broadly streaked yellowish-white; iris deep brown; bill blackish or plumbeous slate; legs and claws dark brown or plumbeous black. Sexes alike. Juvenile is slightly duller above, with much shorter crest, less distinct streaking overall, and much paler yellow on throat, belly and vent. Race *paulus* is supposedly slightly larger, with buffy-olive crest, and fringes of breast feathers greyish, rather than brownish. Voice. Less vocal than most bulbuls. Calls a hard "pyik...pyik", or harsh slurred "djrrri"; also repeated loud, short, jolly phrases of simple strident notes, often in couplets separated by brief pause, e.g. "schew-whit! tchi-whit!" or "cha whik! tu-tu", continuing thus with evenly spaced pauses; may slip into more monotonous, simpler 2-note "tchick-whirk tchik-whirk...", sometimes slowing pace markedly. More complex variants sound like "tchoidi-chik tchoik", or "tchip-it, chi'chi-guweeez" with last note an upslurred guttural buzz. Less often a more involved song with same hard metallic musical quality, but with several notes strung together in quickly descending, almost warbling series.
Habitat. Lower-stature broadleaf evergreen forest, semi-deciduous forest and moist oak-rhododendron (*Quercus–Rhododendron*) forest, forest characterized by *Bucklandia* and Lauraceae; often emerges at edges but never ventures far from relatively tall trees. Commonest in mid-altitude band at 1200–2400 m, sometimes ranging to 3000 m; occasionally down to 300 m in winter.
Food and Feeding. Eats berries and many insects. Birds in Myanmar seen to forage on *Maesa*, *Viburnum*, *Bucklandia*, *Ilex*, *Heptapleurum* and other berries; stomachs of specimens in N Thailand contained only insects. Forages singly or in pairs, in non-breeding season also in small parties of up to twelve individuals. Forages from bushes upwards, but most often in treetops, often hidden among dense foliage, and perching in open much less often than do most members of genus. Insects often caught in short aerial sallies from tops of trees.
Breeding. Little reliable information. Breeds May–Jul. Reported nests in each case a robust, compact cup composed of fine elastic twigs, coarse fern roots, twigs, dead stems and scraps of moss, inner lining of very fine shreds of grass, placed low in dense undergrowth, usually in thick bush or bamboo clump, close to ground and hidden by twigs and creepers; likely that, at least sometimes, nest placed much higher up in tree. Clutch usually 3 eggs, sometimes 2. No other information.
Movements. Resident, but subject to altitudinal movements. In parts of range, distinct movement to lower levels in cold season reported.
Status and Conservation. Not globally threatened. Generally fairly common throughout range. Thinly distributed in NE India, but total population there must be large in view of large area of suitable habitat surviving in West Bengal, Assam, Arunachal Pradesh and other NE states. Fairly common in Bhutan, where much habitat remains. Status in Myanmar unknown, but large amounts of unsurveyed habitat remain in highland regions. Local and uncommon in Nepal and much of N Thailand. Occurs in a range of protected areas, including Namdapha National Park, in India, Thrumshingla National Park, in Bhutan, and Doi Inthanon National Park, in Thailand.
Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Bingham (1903), Cheng Tsohsin (1987), Davidson (1998), Deignan (1945), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Harington (1909a), Hume (1888), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), King *et al.* (2001), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Riley (1938), Ripley (1948, 1982), Rippon (1896, 1901), Robson (2000), Rothschild (1921), Round (2000b), Severinghaus (1978), Singh (1995), Smythies (1986), Stanford & Mayr (1940–1941), Stevens (1923–1925), Stuart Baker (1892–1893, 1922–1930), Wickham (1929–1930).

5. Cream-striped Bulbul

Pycnonotus leucogrammicus

French: Bulbul rayé **German**: Strichelbülbül **Spanish**: Bulbul Rayado
Other common names: Streaked/Striated/Sumatran Bulbul

Taxonomy. *Ixos leucogrammicus* Statius Muller, 1836, Sumatra.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This aberrant species perhaps merits placement, along with *P. striatus*, in a separate genus, *Alcurus*. Monotypic.
Distribution. Hill ranges of W Sumatra (Aceh S to Sumatra Selatan).



Descriptive notes. 17–18 cm. Medium-small, streaky bulbul. Forehead and crown are dark greyish-brown finely streaked pale, feathers slightly elongated to form modest crest (often partially raised); neck to uppertail-coverts slightly paler greyish-brown with fine white shaft streaks; upperwing and tail dark brown with dull olive fringes, these most distinct on secondaries and base of tail feathers; face strongly streaked white, chin and throat uniform creamy white; upper breast contrastingly dark olive, with creamy feather centres creating boldly scalloped effect which fades on lower breast, leaving rest of underparts uniform murky white, tinged yellow on vent and undertail-coverts; iris bright orange-yellow to reddish-brown; bill black, sometimes paler greyish at base; legs brown. Sexes alike. Juvenile undescribed. Voice. Said to have sharp and chirpy contact call; one vocalization is a steady trisyllable with first note highest, "tree, troo-troo", usually given every 5–10 seconds. Presumed song a rather quiet, throaty, mumbling, unmusical warble.
Habitat. Evergreen forest, edges and second growth in mountains, at 800–1900 m. In N of range found in forest and thick secondary vegetation between tobacco fields; in C & S parts likewise often seen at forest edges and roadsides where forest relatively intact.
Food and Feeding. Eats fruit, possibly also insects; stomachs of specimens from N Sumatra contained "fruitpeel, brown pips and a little pulp". Usually encountered singly or in pairs, sometimes as small (family?) groups, often accompanying mixed foraging flocks. Spends most time in middle storey or subcanopy.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Fairly common in mid-elevation forests; thought to be generally uncommon in N Sumatra, though much of this area barely investigated by ornithologists. Occurs in Kerinci-Seblat National Park and Bukit Barisan Selatan National Park.
Bibliography. Chasen & Hoogerwerf (1941), Inskipp *et al.* (1996), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Ripley (1943), Stattersfield *et al.* (1998), Tobias (1995), Tobias & Phelps (1994).

6. Spot-necked Bulbul

Pycnonotus tympanistrigus

French: Bulbul à cou tacheté **German**: Goldbürzelbülbül **Spanish**: Bulbul Cuellipinto
Other common names: Olive-crowned Bulbul

Taxonomy. *Ixos tympanistrigus* Statius Muller, 1836, Sumatra.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species placed by some earlier authors in subgenus *Alcurus*, alongside *P. striatus* and *P. leucogrammicus*, and similarity in plumage to *P. zeylanicus* noted by others. Taxonomic affinities need review, including analysis of morphology, voice, behaviour and genetics. Monotypic.
Distribution. Hill ranges of W Sumatra (Aceh S to Sumatra Selatan).



Descriptive notes. 16 cm. Medium-small, relatively rotund, brownish bulbul. Crown, nape and mantle are dull greenish-brown; cheeks and face whitish, tiny blackish barbs on malar and ear-coverts, narrow blackish submoustachial stripe; distinctive and conspicuous half-moon patch bordering rear of ear-coverts bright yellowish-white; wings and tail dark brown, outer webs of remiges and rectrices fringed dull olive; throat white; underparts whitish, strongly mottled brown, more uniformly brownish on flanks and lower belly, with yellowish tinge on crissum; iris yellowish-brown; bill and legs blackish-brown. Sexes alike. Juvenile undescribed. Voice. Disyllabic "tdip-diew", first note higher; presumed alarm note a repeated emphatic "jret-jret-jtry".
Habitat. Evergreen forest, edges and second growth; at 300–1400 m, usually commonest at mid-elevations (600–900 m).
Food and Feeding. Diet includes berries and other small fruits, possibly also some insects. Normally in pairs or very small (family?) groups in middle storey and canopy. Sometimes joins mixed-species foraging flocks, but often found independently.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Until recently was considered quite rare, with few records from relatively few sites. Has since been found widely in the Barisan Range in areas where forest cover remains extensive in altitudinal band occupied by this species. Although not imminently threatened with extinction, it is restricted to lower elevational zone than *P. leucogrammicus*, and is therefore more susceptible to catastrophic rate of deforestation currently affecting the lowlands and lower slopes of Sumatra. Population requires monitoring, and suitable habitat needs effective protection within key reserves, e.g. Kerinci–Seblat and Bukit Barisan Selatan National Parks.
Bibliography. Butchart & Stattersfield (2004), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Holmes (1996), Inskipp *et al.* (1996), MacKinnon & Phillipps (1993), MacKinnon *et al.* (2000), van Marle & Voous (1988), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Tobias (1995), Tobias & Phelps (1994).

7. Black-and-white Bulbul

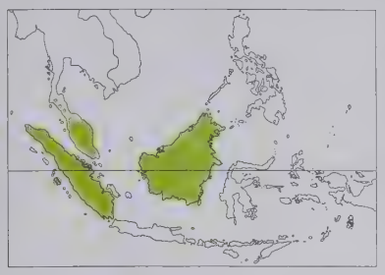
Pycnonotus melanoleucos

French: Bulbul demi-deuil **German**: Trauerbülbül **Spanish**: Bulbul Blanquinegro

Taxonomy. *Microtarsus melanoleucos* Eyton, 1839, Melaka, Peninsular Malaysia.

Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species may merit isolation in a monotypic genus *Microtarsus* on grounds of morphology, voice and behaviour. Characters of putative race *proximus* (Siberut, in W Sumatra) fall within range of variation found throughout species' entire distribution. Monotypic.

Distribution. Extreme S Thailand, Peninsular Malaysia, Sumatra (including Siberut) and Borneo.



Descriptive notes. 16–18 cm; 23–33 g. Medium-small, quiet, relatively unobtrusive bulbul, as adult virtually unmistakable. Male is uniform blackish-brown, with contrasting upperwing-coverts and underwing-coverts mostly creamy white; tail rounded and all black; iris chocolate-brown to red-brown, perhaps even red; bill black; legs black or black-brown, occasionally bluish-grey. Female is slightly browner than male, with less white on upperwing-coverts (black of covert tips runs narrowly back along outer margins and shafts, forming grid pattern); some have wing panel tinged tawny-brown. Juvenile is much paler and browner, upperparts dark brown with ash-brown fringing (scaly effect), upperwing-coverts lacking white, but fringed with ashy olive on outer webs; tail dull brown, sometimes strongly tipped whitish; underparts off-white with shafts and tips variably sullied pale brown, giving slightly mottled or streaked effect, especially on chest; iris grey-brown. VOICE. Generally quiet. Occasionally a tuneless, clear, upward-inflected disyllable, variously transcribed as "hew-it", "too-wit", "chew-it", "kwe-it", "pet-it" or "tee-too"; similar call given as "cherlee", sometimes expanded to "cherlee-chlee-chlee-chee-chee". Sometimes several call notes given in steady sequence, producing effect not unlike the call (song?) of *P. atriceps*, but not so loud and clinky in tone.

Habitat. Broadleaf lowland evergreen forest (primary forest and selectively logged forest), mixed dipterocarp forest, second growth, and forest edge; also recorded in gardens in forested regions, peatswamp-forest, tidal riverine forest, dipterocarp/*kerangas* transition forest, and overgrown mimosa (*Albizia*) and rubber (*Hevea*) plantations. Tends not to venture far out into large clearings with scattered trees or shrubs. From hinterland of coasts to 1830 m, occasionally higher; commonest in lowlands.

Food and Feeding. Fruits; also eats caterpillars, but few reports of insects in diet. Seems partial to fruits of mistletoes (Loranthaceae), *Lantana* and *Melastoma*; one radio-tagged individual favoured fruiting vines. Observed to eat figs (including *Ficus microcarpa* and *F. obscura*) but, in contrast to forest-dwelling congeners, seems to ignore most fig species. Arboreal substrate-gleaner. Found at all levels of forest; often seen in canopy but also regularly caught in mist-nets, suggesting that some foraging occurs low down on fruiting shrubs. Travels singly or in small groups (mostly of 2–9 individuals), and ranges widely in search of fruit. Joins other bulbuls at fruiting trees, arriving in numbers that fluctuate from day to day.

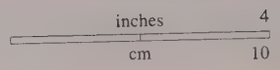
Breeding. Breeds Jan–May. Nest cup-shaped, interior measurements of one were 7 cm wide × 3 cm deep, composed chiefly of sticks bound together by pieces of climbing plants, lined with same material admixed with a few dark fibres; placed in fork of branches, once 6 m up in upright fork of old rubber tree, once 1 m up in low horizontal fork of sapling. No other information.

Movements. Resident, but nomadic over wide area; often arrives in numbers in one locality, staying for a few weeks, and then disappearing altogether. In Peninsular Malaysia, one radio-tagged individual ranged over c. 8–18 ha per day and 50 ha in one week, roosting at different site each night. In partially cleared landscapes, individuals or groups move between forest patches. Occasional records at high altitudes, including one individual picked up dead at 3050 m, suggest that longer-distance movements occur.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Fairly common in Peninsular Malaysia and parts of Borneo, but often difficult to find because of its unpredictable irruptive movements; apparently rather rare in Sumatra. Formerly occurred in Singapore, but no recent records from there. Rampant clearance of lowland evergreen forest in Sundaic region must be causing drastic declines in this species' population, but its tolerance of patchy habitat, combined with its occurrence in submontane zone, suggests that it is under no immediate threat of extinction. Its nomadic tendencies, however, suggest some degree of specialization that may make it more susceptible to increasing habitat fragmentation. Occurs in a number of protected areas, e.g. Taman Negara National Park (Peninsular Malaysia), Gunung Leuser National Park (Sumatra) and Danum Valley Conservation Area (Borneo).

Bibliography. Büttikofer (1887), Collar *et al.* (2001), Danielsen & Heegaard (1995), Davison (1987), Davison & Chew Yen Fook (1996), Duckworth & Kelsh (1998), Duckworth *et al.* (1996), Gibson-Hill (1949), Holmes (1994, 1996, 1997), Hose (1893), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lambert (1987, 1989a, 1989b, 1992), Lekagul & Round (1991), MacKinnon & Phillipps (1993), Mann (1991), van Marle & Voous (1988), Medway & Wells (1976), Mitra & Sheldon (1993), Riley (1927b), Robson (2000), Smythies (1957, 1999), Stattersfield & Capper (2000), Vowles & Vowles (1997), Wells (2005), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon *et al.* (1991).

PLATE 15



8

typical

intermediate

9

grey morph

♂

10

♀

ssp *flaviventris*

11

ssp *johnsoni*
red-throated

12

13

14

15

ssp *squamatus*

ssp *webberi*

16

ssp *borneensis*

ssp *cyaniventris*

17

ssp *paroticalis*

ssp *jocosus*

ssp *emeria*

18

ssp *xanthorrhous*

ssp *sinensis*

ssp *hainanus*

20

ssp
formosae

19

ssp *andersoni*

ssp *fuscicaudatus*

ssp *abuensis*

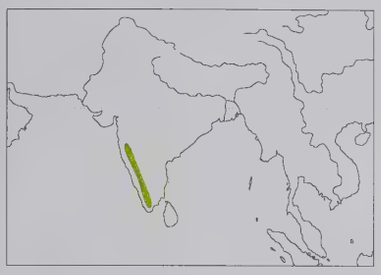
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8. Grey-headed Bulbul

Pycnonotus priocephalus

French: Bulbul colombar **German**: Graukopfbülbül **Spanish**: Bulbul Cabecigrís

Taxonomy. *B[rachypus]. priocephalus* Jerdon, 1839, Periyar, Tamil Nadu, India.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species may merit separation in resurrected genus *Brachypodius*, alongside *P. atriceps* and *P. fuscoflavescens*. Species name often misspelt as "*poiocephalus*" owing to long-standing confusion in the literature. Monotypic.
Distribution. Western Ghats (from extreme S Maharashtra and Goa S to Kerala) and Palni Hills (Tamil Nadu), in SW India.



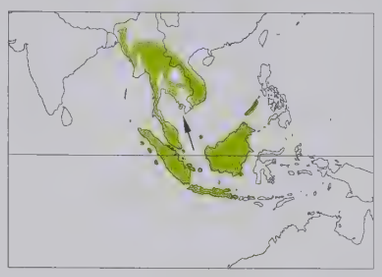
Descriptive notes. 17–19 cm. Small, active, peak-headed, olive-coloured bulbul. Anterior lores and forehead are bright greenish-yellow, rest of lores dull greenish (black feather bases visible from some angles); ocular region, ear-coverts, patch at base of lower mandible and malar streak dull green; crown, nape, side of neck and throat dark ash-grey; mantle, back and scapulars warm dark olive-green; loose and plush feathering of lower back and upper rump black, broadly tipped pale ashy green (appearing mottled green when flattened, barred black when raised); elongated uppertail-coverts bleached grey; flight-feathers blackish-brown, outer webs fringed bright olive-green (covering entire outer web on tertials); most of tail delicate ash-grey, black outer feathers broadly tipped same colour and fringed green on outer webs; chin dull black, merging on to grey throat; rest of underparts pale olive, becoming whitish towards vent; iris whitish-grey (contrasting with dark face); bill strikingly greenish-yellow, palest on culmen and tip, mouth pink with brownish patches or variable yellow and pink; legs pale dusky orange-yellow, claws paler. Sexes alike. Juvenile is as adult, but head darker olive, yellow forehead duller, and underparts colder, duller green; iris probably darker and duller. Voice. Calls incessantly with shrill monosyllabic notes; vocalizations include thin, explosive, metallic, wheezy "jzhwink!", sometimes in long series, also a clearer, more jarring, chiming version, "chraink!".
Habitat. Usually confined to evergreen forest in areas receiving high rainfall; scarce in deciduous forest. Ventures into edge habitats, including bamboo, canebrakes, and *Lantana* scrub in abandoned clearings. Found at all levels of forest and in tall vine-laden shrubs. Likes similar habitat to that occupied by largely syntopic *P. gularis*, but generally prefers more humid areas with denser vegetation. From plains to 1200 m, rarely ascending higher, to 1800 m; commonest at 600–900 m.
Food and Feeding. Diet comprises berries and other fruit, including figs (*Ficus*), *Lantana* and *Ziziphus oenophila*; also a small proportion of insects. Forages at all levels of forest and in tall vine-laden shrubs; can be flighty, nervous and hard to see. Found singly and in pairs, sometimes in small groups of 4–8 individuals at fruiting trees or shrubs; often joins other frugivores such as fairy-bluebirds (*Irena*), orioles (*Oriolus*), etc.
Breeding. Breeds Mar–Jul. Nest a shallow cup, slight and flimsy, easily seen through from below, usually fastened with spider webs to branches of shrub, placed low down, 1–2 m above ground, but probably also sometimes higher in sapling or creeper; nest energetically defended by adults. Clutch 1–2 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Western Ghats EBA. Patchily distributed, but generally not uncommon in suitable habitat; common in the higher woods of Goa. Tends to be rare at lower altitudes, largely because most suitable habitat has been cleared, but in hilly regions extensive forest remains. Occurs in a range of protected areas, including Thattekad Bird Sanctuary, in Kerala, and Periyar Sanctuary, in Tamil Nadu. Many suitable forests (and several important protected areas) exist within Nilgiri Biosphere Reserve, and effective management and protection of this region would go a long way towards ensuring a secure future for this species.
Bibliography. Ali (1969, 1996), Ali & Ripley (1996), Barnes (1889), Betts (1929, 1931), Cardew (1895), Davison (1883), Dickinson *et al.* (2002b), Ferguson & Bourdillon (1903–1904), Fuller (1958), Grimmett *et al.* (1998), Kannan (1998), Lainer (1999), Rasmussen & Anderton (2005), Ripley (1982), Robertson & Jackson (1992), Saha & Dasgupta (1992), Sharpe (1882), Stattersfield *et al.* (1998), Sugathan & Varghese (1996), Wells (2005), Whistler & Kinnear (1932), Zacharias & Gaston (1993, 1999).

9. Black-headed Bulbul

Pycnonotus atriceps

French: Bulbul cap-nègre **German**: Schwarzkopfbülbül **Spanish**: Bulbul Cabecinegro

Taxonomy. *Turdus atriceps* Temminck, 1822, "Sandwich Islands"; error = Sumatra.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species previously placed in a separate genus *Brachypodius*; on basis of vocal, behavioural and morphological features, may merit return to this resurrected genus, alongside *P. priocephalus* and *P. fuscoflavescens*. Usually considered conspecific with last-mentioned, but considerable differences in plumage pattern and voice sufficient to warrant treatment as separate species. Forms described as *P. chalcocephalus* (Bantam district, in Java) and *P. cinereoventris* (Tippera district, in Bangladesh) shown to be variations of grey morph of present species, and "*Brachypodius immaculatus*" found to be a variant of the yellow type. Island races *hyperemnus*, *baweanus* and *hodiernus* poorly differentiated and in need of review. Proposed race *major* (NE India) was described on basis of inaccurate measurements and is invalid. Four subspecies provisionally recognized.
Subspecies and Distribution.
P. a. atriceps (Temminck, 1822) – E Bangladesh (Sylhet and Chittagongs), NE India (S of R Brahmaputra, to N Cachar and Manipur), Myanmar (except N) and S China (SW Yunnan) S to S Thailand, SW Cambodia, S Laos, S Vietnam, Peninsular Malaysia and Greater Sundas, and W Philippines (Calauit, Dumaran, Palawan).
P. a. hyperemnus (Oberholser, 1912) – W Sumatran islands (Simeulue, Nias, Mentawai Is).
P. a. baweanus (Finsch, 1901) – Bawean I (N of Java).
P. a. hodiernus (Bangs & J. L. Peters, 1927) – Maratua I (off E Borneo).



Descriptive notes. 16–18 cm; 20–30 g. Small, active, brightly coloured bulbul with very small legs. Whole head is black with metallic blue-green sheen; upperparts dark olive to yellow-olive, feathers of lower back and rump bright yellow with blackish bases (strongly barred effect when raised or ruffled), long uppertail-coverts bright yellow; rounded tail rich yellow at base and tip, broad black subterminal band; wings blackish, bright olive-yellow outer webs of secondaries and tertials forming large solid panel on inner wing, contrasting with black primaries (two-toned effect); breast and flanks dark olive to yellow-olive, rest of underparts bright yellow; plumage colour individually variable, some birds with greenish wash overall, others brighter yellow; iris pale cobalt-blue (often looks white at distance); bill black; legs brownish-black or dusky. Differs from *P. fuscoflavescens* in obviously black-hooded appearance, conspicuous two-toned wing, and darker subterminal tailbar. Rare grey morph has slaty neck, breast and belly, with vent, undertail-coverts and inner wing variably yellowish or white; in some areas (e.g. E Thailand) another morph occurs, with dull orange or yellow-green replacing yellow. Sexes alike. Juvenile is much duller, with less pronounced wing pattern, dark olive or brownish head and throat, yellow parts of plumage darker and greener, base of rump feathers brown; feathers of uppertail-coverts and undertail-coverts shorter, iris brownish or dull bluish-grey. Race *hyperemnus* is supposedly similar to nominate but with upperparts much darker, underparts slightly darker, bill stouter; *baweanus* differs in slightly larger size and longer tail (grey morph predominates); *hodiernus* is larger, with longer wing, grey-tipped tail, and lacks yellow tones in plumage. Voice. Flight call a single emphatic "tchimp" or "tchep"; similar calls when perched include distinctive, emphatic, downward-inflected "chew" or "chiw", often repeated irregularly every few seconds. Presumed song a similar, often lengthy, series of well-spaced very short, thin, sweet metallic "tink" notes that meander slightly in pitch and emphasis, the whole sequence somewhat disjointed and off-key, typically rising and then falling hesitantly; generally longer, lower and slower than that of *P. fuscoflavescens*. In India said to give melancholy double whistle (verification needed). Lacks boisterous vocalizations of typical members of genus.
Habitat. Broadleaf evergreen forest, mixed deciduous forest and peatswamp-forest, often where fairly open and at edges along roads, clearings, waterways, etc.; occurs also in second growth (at all stages of regeneration after disturbance), mature tree orchards and plantations in vicinity of natural habitat, bamboo, canebrakes, wooded gardens, scattered trees in *Imperata* grassland, back mangroves and well-developed coastal scrub. Often reaches peak density in lowlands, but in some regions commoner on lower slopes at 400–800 m; occasionally ascends to 1600 m, rarely higher (one record at 2450 m, another at 2580 m).
Food and Feeding. Fruits; some invertebrates. Figs (*Ficus*) feature prominently in diet, at Kuala Lompat (Peninsular Malaysia) include forest-edge banyans (*F. benjamina* or *F. microcarpa*), high-crown fruiting *F. glabella* and *F. sumatrana* and seven other species, with range of mean minimum diameter 5·4–14·8 mm; other recorded items include fruit of Rubiaceae, *Callicarpa pentandra* (Verbenaceae), *Clausena excavata* (Rutaceae), *Mallotus macrostachyus* and *Macaranga* (Euphorbiaceae), and *Trema orientalis* (Ulmaceae). Invertebrates taken include, among others, dragonflies (Odonata) and alate termites (Isoptera); two woodlice (Isopoda) found in one stomach, a grasshopper (Orthoptera) in another. Many insects (including dragonflies) and small fruit identified among food items delivered to nestlings. Ripe fruit picked from bushes and trees. Often reported as aerial-sallying for flying insects, often darts out, catches prey, and returns to same or nearby perch; also gleans small amount of invertebrate food from branches. Usually inconspicuous, but restless; in pairs or small parties moving through tall trees, often also in middle storey or lower at edges. Rarely, if ever, descends to ground (has very small legs). Sometimes visits fruiting or flowering shrubs and trees in scattered flocks containing up to 20 individuals (usually fewer than ten).
Breeding. Season Jan–Sept, usually Mar–Jun. Nests singly or in loose clumps of pairs, these clumps probably temporary and breeding not always synchronized, but one group of four pairs in Selangor (Malaysia) had full clutches of eggs simultaneously; one inter-nest distance measured 40 m. Nest a loosely constructed open cup, sometimes more compact and firmly made, in India described as made of tough creeper stems and twigs interwoven with few blades of coarse grass, often with outer layer of dead leaves, and lined with fine grass stems; in Thailand and Malaysia made of grass, creeper stems, plant fibres and much dead leaf material, and often lined with black fibres (possibly fungal hyphae); one in Borneo was of grass and vegetable fibres, another was built from dead twigs and other plant fibres; placed 1–6 m up (but usually low) in bush or tree, often in upright fork or cane fronds, recorded sites e.g. thorny bush and rhododendron (*Melastoma malabathricum*) in clearing, creepers and hanging vines, leaf axil of a ginger (Zingiberaceae), nodal branch tuft of bamboo, branch fork or main fork of forest sapling, similar fork in dense thicket of rubber (*Hevea*) saplings, outer-branch fork of plantation rubber, and in two instances exotic conifer planted at forest edge. Clutch 1–3 eggs, in Peninsular Malaysia usually 2; no information on incubation and fledging periods; both pair-members tend nestlings and fledglings; fledged broods of two in Malaysia.
Movements. Resident, but partially nomadic. Flocks roam and disperse over wide area in non-breeding season; rarely disappears entirely from a site, but paucity of recaptures suggests that many individuals are mobile. Seasonal altitudinal movements noted in some regions, e.g. NE India and N Bangladesh.
Status and Conservation. Not globally threatened. Locally common throughout much of range, tolerating fair degree of habitat degradation; very rare in S China and rare in India, with very few recent records. Grey morph was once locally fairly common in NE India, and remains regular in Java; it is commonest morph on Bawean I, and only morph on Maratua I. This species has been recorded in a large number of national parks, including Nam Bai 7at Tien (Vietnam), Khao Yai (Thailand), Taman Negara (Peninsular Malaysia), Kerinci-Seblat (Sumatra) and Ujung Kulon (Java).

On following pages: 10. Andaman Bulbul (*Pycnonotus fuscoflavescens*); 11. Black-crested Bulbul (*Pycnonotus flaviventris*); 12. Ruby-throated Bulbul (*Pycnonotus dispar*); 13. Flame-throated Bulbul (*Pycnonotus gularis*); 14. Black-capped Bulbul (*Pycnonotus melanicterus*); 15. Bornean Bulbul (*Pycnonotus montis*); 16. Scaly-breasted Bulbul (*Pycnonotus squamatus*); 17. Grey-bellied Bulbul (*Pycnonotus cyaniventris*); 18. Red-whiskered Bulbul (*Pycnonotus jocosus*); 19. Brown-breasted Bulbul (*Pycnonotus xanthorrhous*); 20. Light-vented Bulbul (*Pycnonotus sinensis*); 21. Styan's Bulbul (*Pycnonotus taivanus*).

Bibliography. Ali & Ripley (1996), van Balen (1986), Chasen (1939), Chasen & Hoogerwerf (1941), Cheng Tsohsin (1987), Daltry & Momberg (2000), Davison (1987), Deignan (1945), Dickinson & Dekker (2002b), Dickinson, Dekker *et al.* (2002b), Dickinson, Kennedy & Parkes (1991), Duckworth, Salter & Khounboline (1999), duPont (1971), Dymond (1994), Frith (1981a), Gibson-Hill (1949), Glenister (1971), Gregory-Smith (1997a), Grimmett *et al.* (1998), Harington (1909b), Holmes (1994), Hoogerwerf (1963b, 1967), Hopwood (1912, 1919), Hume (1888), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lambert (1989b), Lekagul & Round (1991), Lim Boo Liat (1965), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), Madoc (1976), van Marle & Voous (1988), McClure (1966), Medway & Wells (1976), Mees (1986), Meyer de Schauensee (1984), Nash & Nash (1988), Oberholser (1912, 1917a), Primrose (1901), Rajathurai (1996), Rasmussen & Anderton (2005), Riley (1938), Robson (1998, 2000, 2001), Severinghaus (1978), Smythies (1986, 1999), Stepanyan (1995), Stuart Baker (1892–1893, 1922–1930), Temminck (1828), Thewlis *et al.* (1996), Vowles & Vowles (1997), Walters & Dickinson (2001), Wells (1990a, 2005), Wickham (1929–1930), Zheng Guangmei & Zhang Cizu (2002).

10. Andaman Bulbul

Pycnonotus fuscoflavescens

French: Bulbul des Andaman **German**: Andamanenbülbül **Spanish**: Bulbul de Andamán
Other common names: Andaman Black-headed Bulbul

Taxonomy. *Brachypodius fuscoflavescens* Hume, 1873, Port Mouat and Mount Harriet, South Andaman.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species previously placed in a separate genus *Brachypodius*; on basis of vocal, behavioural and morphological features, may merit return to this resurrected genus, alongside *P. priocephalus* and *P. atriceps*. Usually considered conspecific with last-mentioned, but considerable differences in plumage pattern and voice sufficient to warrant treatment as separate species. Monotypic.
Distribution. Andaman Is (South I and Middle I).



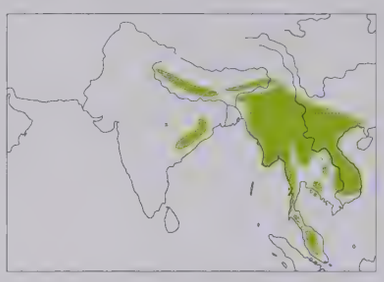
Descriptive notes. 14–17 cm. Small, active bulbul. Male has dull blackish forehead and throat usually with glossy greyish sheen, grading into dark olive crown and face; nape, mantle, back and scapulars dusky olive; rump feathers yellow at tip and black at base (vaguely barred effect where bases visible); tail olive-yellow at base with dark brown subterminal bar and yellow tips (tips broadest on lateral feathers); upperwing coverts olive-green; flight-feathers dark brown on inner webs, dull olive-green fringing on outer webs, including on primaries; below, bright yellow, especially on belly to undertail-coverts, suffused with olive on breast; iris pale cobalt-blue; bill blackish-grey, on some individuals plumbeous blue with upper mandible tipped and edged black, on others nearly all blackish but paler and bluish at base; legs blackish-grey. Differs from *P. atriceps* in much less obviously black-hooded appearance, more dusky upperparts, paler subterminal tailbar, wing lacking conspicuous two-toned effect. Female is slightly smaller than male, with paler olive-green head lacking sheen, more greenish-yellow underparts. Juvenile is like female but duller, more uniform olive-green, with paler bill, browner head, paler throat, and narrower, weaker yellow tail tip. VOICE. Song a brief high-pitched, quick series of very short, thin, metallic "tsit-tsut-tsit" notes that alternate in pitch; generally higher-pitched, more regular in pattern, and briefer and faster than that of *P. atriceps*. Calls include similar note given singly every few seconds, and shrill, upward-inflected, almost disyllabic "shrinkit!", much more metallic and hard than equivalent call of *P. atriceps*.
Habitat. Evergreen forest, light deciduous forest, edges and thick secondary growth. Of 15 recent sightings, 54% in evergreen forest, 14% in semi-evergreen and 32% in deciduous; thus, seems to have relatively broad niche weighted towards evergreen forest, in contrast to *P. jocosus* (of Andaman race *whistleri*), which sighted more frequently but never in evergreen forest.
Food and Feeding. Fruit, plucked from branches of trees and shrubs; probably also insects, but confirmation required. Usually encountered singly or in pairs, sometimes in small groups; often an inconspicuous component of understorey or mid-storey mixed-species flocks.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Not evaluated. Likely to qualify as restricted-range species, confined to Andaman Islands EBA. Has received little attention, as for long considered a race of *P. atriceps*; estimates of status vary from abundant through comparatively rare to decidedly rare. Thought to be locally common, particularly in and around Mount Harriet National Park. Review of status required, with the aim of clarifying population size, trends and conservation requirements.
Bibliography. Ali (1996), Ali & Ripley (1996), Ball (1873), Gee (1995), Grimmett *et al.* (1998), Hume (1873a, 1874), Osmaston (1906), Rasmussen & Anderton (2005), Ripley (1982), Stattersfield *et al.* (1998), Yoganand & Davidar (2000).

11. Black-crested Bulbul

Pycnonotus flaviventris

French: Bulbul à huppe noire **German**: Goldbrustbülbül **Spanish**: Bulbul Crestinegro
Other common names: Black-crested Yellow Bulbul, Black-headed Yellow Bulbul

Taxonomy. *Vanga Flaviventris* Tickell, 1833, Dampara, Orissa, India.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species previously placed, along with *P. dispar*, *P. gularis*, *P. melanicterus* and *P. montis*, in a separate genus *Rubigula*, to which all five may yet be returned. They form a superspecies, and have often been treated as conspecific under the name "*P. melanicterus*". Situation in SE Asia complicated by a tight clustering of races and the presence of different colour morphs; likely that some described races are insufficiently distinct to warrant recognition. Eight subspecies provisionally recognized.
Subspecies and Distribution.
P. f. flaviventris (Tickell, 1833) – N, NE & E India (Himalayan foothills E from Himachal Pradesh, S to to Meghalaya, also hills of Madhya Pradesh, also Eastern Ghats from Orissa S to Andhra Pradesh), Nepal, E Bangladesh, N, C & W Myanmar and S China (W Yunnan).
P. f. vantynei Deignan, 1948 –E & S Myanmar and NE & NW Thailand E to S China (S Yunnan, S Guangxi) and N Indochina.
P. f. xanthops Deignan 1948 – SE Myanmar (including N Tenasserim) and W Thailand.
P. f. auratus Deignan 1948 – NE Thailand and C Laos.
P. f. johnsoni (Gyldenstolpe, 1913) – C, NE & SE Thailand and S Indochina.
P. f. elbeli Deignan, 1954 – Gulf of Thailand islands (at least Ko Kut, Ko Chang).
P. f. negatus Deignan, 1954 – S Myanmar (C Tenasserim) and SW Thailand (valley of R Mae Klong).
P. f. caecilii Deignan, 1948 – extreme S Myanmar (S Tenasserim), SE & SW Thailand and N Peninsular Malaysia.
Introduced (race unknown) to Singapore.



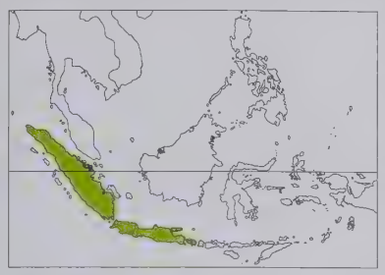
Descriptive notes. 18·5–19·5 cm; male 30–34 g, female 28–31 g. Medium-sized, conspicuous bulbul with permanently erected recurved crest, squared long tail. Nominate race has head entirely glossy blue-black, bearing mid-crown tuft of elongated feathers forming recurved crest (c. 20 mm tall); upperparts dark golden olive-green, somewhat brighter on lower back and rump; wings and relatively plain tail browner (dusky olive) with bright golden-olive fringes; bright rich yellow below, suffused with olive on breast and flanks (a few individuals have underparts tinged orange); iris conspicuously creamy white or pale yellow; bill black; legs black, brownish-black or dark slate-grey. Sexes similar. Juvenile is paler overall, with sooty head and little or no crest (faint purplish gloss on longest crest feathers), chin black, throat olive (same colour as upperparts), iris pale grey. Races vary mainly in plumage tone, those around Gulf of Siam generally having shorter crest and more noticeable tinge of orange on breast than races from India and Myanmar: *vantynei* is darker than nominate, duller green upperparts almost lacking golden suffusion, underparts duller yellow (rare variant has variable amount of red on throat); *xanthops* is smaller than previous, upperparts much lighter and more golden (but darker, more greenish and less golden than nominate); *auratus* has somewhat darker and less golden upperparts than last (also, rare variant has variable amount of red on throat); *johnsoni* is similar to previous but smaller, with upperparts slightly darker and less suffused with golden (a colour morph occurring chiefly in Indochina has variable amount of red on throat); *caecilii* is similar to previous (black-throated form), but upperparts darker olive-green, almost without golden suffusion; *negatus* has upperparts lighter and more gold-suffused than last (seeming intermediate between that and *xanthops*); *elbeli* is duskier on chest and mantle, lacking golden suffusion found in adjacent forms. VOICE. Song recognizably bulbul-like but very sweet and musical, lacking harsh or guttural notes, whole phrase fairly simple, at first halting and then speeding up, each note staccato and distinct, becoming more emphatic and upward-inflected, e.g. "whik-whik, whirru weet!", "whit-whaet-ti-whaet" or "chu-chi-chu-chi-wit"; shorter versions include "whik, wiur". In Malaysia (race *caecilii*) similar, concise, strongly modulated phrases, as "pic tyu-wai" or "quill quee-ah", and shorter "wheet-siu".
Habitat. Open forest, mixed deciduous forest, abandoned clearings, tall hedgerows, orchards, edges of settlements, gardens; rarely in dense forest, and then only on top of canopy. In Nepal frequents lower altitudes, where dry dipterocarp forest is dominated by sal (*Shorea robusta*). In Thailand and Malaysia also inhabits landslips, roadsides, riverbanks, bamboo jungle, tree plantations e.g. rubber (*Hevea*), scattered tree cover in tea plantations, and patches of *Baeckia* heath-forest. Level lowlands, from sea coasts to c.1500 m, rarely to 2400 m; reported upper limit of 1970 m in Cameron Highlands (Peninsular Malaysia).
Food and Feeding. Feeds mainly on fruit, also small amount of insects. Fruit taken, and also fed to fledglings, includes small berries of e.g. *Eurycoma longifolia* (Simaroubaceae) and *Solanum xanthocarpum* (Solanaceae), and figs (e.g. *Ficus macrocarpa*, *F. glabella*, *F. sumatrana*). Found singly or in pairs, occasionally in small (family?) groups of up to six individuals, on shrubs or trees; sometimes noisy, but usually rather quiet and retiring for a bulbul. Seldom descends to ground, although has been seen to feed on ground on wild strawberries (*Fragaria*) in Myanmar. Less insectivorous than many bulbuls, but regularly hover-gleans insects from branches and leaves; less often, hawks flying insects, e.g. alate termites (Isoptera), from high perch.
Breeding. Season Mar–Sept (mainly May–Jun) in India, Mar–Apr in Myanmar and Jan–Aug in Peninsular Malaysia. Nest very neat and small for size of bird, outer walls composed of dead leaves (apparently often orange or yellow) interlaced by thick shreds of bark and elastic twigs, strengthened and bound by cobwebs, inner layer made of grass stems, fine twigs and fern roots, lined with fine fibres and soft moss strands; usually placed in low bush, 1–2 m up, or in creepers against tree or wall, less often in branches or upright fork of high bush or small to medium-sized tree e.g. citrus or mango (*Mangifera*), sometimes up to 9 m above ground; other sites include road-bank tangles of scrambling ferns and bamboo clumps. Clutch in Malaysia 2 eggs, in India and Myanmar 2–4 (usually 3); no information on incubation and fledging periods; both parents tend fledglings.
Movements. Resident. Was in past noted to roam in cold weather around Yangon (Myanmar), tending to leave forest and enter towns.
Status and Conservation. Not globally threatened. Generally common in much of range, including NE India, Bangladesh, Myanmar, S Laos, parts of Thailand and Peninsular Malaysia; rare in S China. Once common around Yangon, in Myanmar, but disappeared in early 1900s as a result of urbanization. Is generally favoured by deforestation, and therefore in no risk of extinction. Trapping for cagebird trade a problem in SE Asia, but this species appears resilient in the face of moderately intense pressure. A small introduced population in Singapore appears to be self-sustaining.
Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Ball (1874, 1878), Birand & Pawar (2004), Cheng Tsohsin (1987), Daltry & Momberg (2000), Davidson (1998), Deignan (1945, 1948b, 1954), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Field (1922), Frith (1981a), Gibson-Hill (1949), Grimmett *et al.* (1998), Gyldenstolpe (1916), Harington (1909b, 1910, 1911), Harvey (1990), Hopwood (1912), Hopwood & Mackenzie (1917), Hume (1875, 1888), Hume & Davison (1878), Inglis (1896), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), Macdonald (1906), MacKinnon & Phillipps (2000), McClure (1966), Mears & Oates (1907), Medway & Wells (1976), Meyer de Schauensee (1946b, 1984), Oustalet (1903), Rasmussen & Anderton (2005), Riley (1938), Ripley *et al.* (1988), Robinson & Kloss (1919a), Robson (1997c, 2000, 2002d), Robson *et al.* (1993b), Scully (1879), Singh (1995), Smythies (1986), Stanford (1935), Stanford & Ticehurst (1931), Stepanyan (1995), Stevens (1914–1915), Stuart Baker (1922–1930), Thewlis *et al.* (1996), Ticehurst (1933), Wells (2005), Whistler & Kinnear (1932), Zheng Guangmei & Zhang Cizu (2002).

12. Ruby-throated Bulbul

Pycnonotus dispar

French: Bulbul de la Sonde **German**: Sunda-Goldbrustbülbül **Spanish**: Bulbul Gorgirrojo

Taxonomy. *Turdus dispar* Horsfield, 1821, Java.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species previously placed, along with *P. flaviventris*, *P. gularis*, *P. melanicterus* and *P. montis*, in a separate genus *Rubigula*, to which all five may yet be returned. They form a superspecies, and have often been treated as conspecific under the name "*P. melanicterus*". Monotypic.
Distribution. Sumatra, Java and Bali.



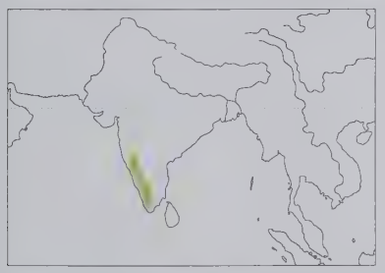
Descriptive notes. 17–20 cm. Medium-large, long-tailed, noisy, conspicuous bulbul. Has glossy black head, almost lacking crest; upperparts uniform olive-green; wings fringed brighter yellow-green on primaries and secondaries; tail dark brown, usually with pale tips of outer feathers; chin and throat feathers bright crimson, distinctly slim, elongated, stiffened and often flared; upper breast rich orange-yellow (a much deeper colour than *flaviventris*), rest of underparts yellow, suffused with orange, smudged greyer on flanks; iris bright fiery red; bill black, gape pink; legs brownish-black. Differs from *P. flaviventris* in e.g. much smaller crest, much deeper orange on breast. Sexes alike. Juvenile has dull yellow throat (red feathers quickly growing through), and duller, duskier breast; iris paler and duller. Voice. Calls transcribed as "tee-tee-wheet-wheet", "whit-wheet-wit" or "hii-tii-hii-tii-wiit", and various permutations of these elements; similar to *P. flaviventris*.
Habitat. Range of shrubby habitats and open woodland, including rubber (*Hevea*) plantations. Avoids tall forest, preferring even highly degraded areas, larger clearings, edges of towns, drier semi-deciduous forest, coastal woodland and back mangroves etc. To c. 1000 m.
Food and Feeding. Eats berries and other fruit, and small amounts of insects. No other information.
Breeding. Poorly known. Eggs found in Apr in Sumatra and Aug in C Java. Clutch 1–2 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common to common; rare in Bali. In most of range still reasonably common in drier forests of lowlands, despite heavy degradation; common even in E & S Java, where heavily trapped for the cagebird trade. In view of trapping pressure, populations should be monitored. Occurs in several protected areas, including Kerinci-Seblat National Park, in Sumatra, and Ujung Kulon, Meru Betiri and Baluran National Parks, in Java.
Bibliography. van Balen (1999), Büttikofer (1887), Danielsen & Heegaard (1995), Deignan (1948b), Dickinson & Dekker (2002b), van Helvoort & Soetawijaya (1987), Hoogerwerf (1949b), Inskipp *et al.* (1996), MacKinnon (1988), MacKinnon & Phillipps (1993), MacKinnon *et al.* (2000), van Marle & Voous (1988), Sargeant (1997), Tobias & Phelps (1994).

13. **Flame-throated Bulbul**

Pycnonotus gularis

French: Bulbul à gorge rubis **German**: Kerala-Goldbrustbülbül **Spanish**: Bulbul Gorginaranja
Other common names: Ruby-throated(!)/Orange-throated Bulbul, Ruby-throated Yellow Bulbul

Taxonomy. *Brachypus gularis* Gould, 1836, Travancore [= Kerala], India.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species previously placed, along with *P. flaviventris*, *P. dispar*, *P. melanicterus* and *P. montis*, in a separate genus *Rubigula*, to which all five may yet be returned. They form a superspecies, and have often been treated as conspecific under the name "*P. melanicterus*". Monotypic.
Distribution. Western Ghats S from Goa, in SW India.



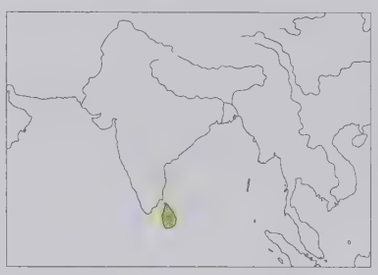
Descriptive notes. 18–19 cm. A slim, noisy, relatively inconspicuous bulbul with very short, ragged occipital crest, relatively short, very slightly rounded tail. Head, including crest, is glossy black; upperparts yellowish-olive-green, wings browner with golden-olive fringes; tail bright olive, small creamy-white tips at corners; deep flame-coloured orange throat patch (looks dark at distance or in poor light), breast orange-yellow with only a little olive mixed in, rest of underparts bright yellow; iris pale yellow (contrasting with black head); bill black; legs dusky grey-green to blackish-grey or horny brown. Sexes alike. Juvenile has brownish-black head, yellow throat. Voice. Song a sweet, hurried, very musical, rather high-pitched stuttering but emphatic series, e.g. "pr'r'r'rit, tir'r, r'r'rit, tir'r r'rit", each note rising steeply; rather different from that of *P. flaviventris*. Frequent calls include subdued, upslurred churring "prririt" notes like initial notes of song phrase, or clear short rising "prit" notes.
Habitat. Evergreen foothill forest, especially in lower-edge ecotone with drier formations, in thorny bamboo brakes, and riverine shrubbery. Fond of abandoned clearings overgrown with secondary forest and well-developed thickets of *Lantana* and *Mimosa*; avoids active cultivation. From plains to 900 m, rarely to 1200 m.
Food and Feeding. Feeds on figs (*Ficus*) and other fruit, and insects. Often in small flocks, which seem to keep more to dense cover; much less conspicuous than *P. flaviventris*.
Breeding. Season Jan–Aug, mainly Feb–Apr. Nest a small neat cup of dead leaves (often yellow or orange), bound lightly with cobweb and broad grass stems, skimpy lining of finer grass, usually 1–3 m above ground in bush. Usual clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally uncommon, but locally fairly common (e.g. in S Kanara). Relatively scarce in N of range, but thought still to be common in Goa; generally scarce and local in S. Unlikely to be in imminent danger, as it is not restricted to intact forest and tolerates quite heavily degraded habitats. A sizeable population occurs in Periyar Sanctuary. Many suitable forests (and several important protected areas) are found within the Nilgiri Biosphere Reserve, and effective protection and management of this region would go a long way towards ensuring a secure future for this species.
Bibliography. Ali (1969, 1996), Ali & Ripley (1996), Barnes (1889), Betts (1929, 1931), Butler (1881), Davison (1883), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Fairbank (1877), Ferguson & Bourdillon (1903–1904), Grimmett *et al.* (1998), Kannan (1998), Lainer (1999), Rasmussen & Anderton (2005), Ripley (1982), Robertson & Jackson (1992), Saha & Dasgupta (1992), Strange (2002), Walden (1866), Whistler & Kinnear (1932), Zacharias & Gaston (1999).

14. **Black-capped Bulbul**

Pycnonotus melanicterus

French: Bulbul à tête noire **German**: Sri Lanka-Goldbrustbülbül **Spanish**: Bulbul Carinegro
Other common names: Black-capped Yellow Bulbul, Black-headed Yellow Bulbul

Taxonomy. [*Muscicapa*] *melanictera* J. F. Gmelin, 1789, Sri Lanka.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. flaviventris*, *P. dispar*, *P. gularis* and *P. montis*, and all five usually treated as conspecific. All may merit placement in a separate genus, *Rubigula*. Present species is the most distinct member of the superspecies owing to its short rounded tail with broad white tips, but its other characters (lack of crest, yellow throat, dark iris) are mirrored independently by distant Bornean *P. montis*. Monotypic.
Distribution. Sri Lanka.



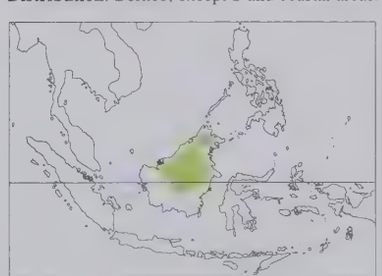
Descriptive notes. 18–19 cm. Medium-sized, noisy, conspicuous bulbul with strongly rounded tail, half of basal portion of which covered by elongated uppertail-coverts and undertail-coverts; essentially uncrested (slender filaments protrude from nape). Head is intense, unglossed black, upperparts dusky olive-green, yellowest on rump; wings and tail browner, flight-feathers and rectrices with bright olive-yellow fringes, outer tail feathers with broad white tips, narrow tips on central pair; rich saffron-yellow below, breast lightly clouded with olive; iris light brown to red (partly age-related); bill black; legs dark pinkish-grey to blackish. Sexes alike in plumage, female said to have duller iris. Juvenile is dark brown on mid-crown and nape, has duller iris than adult. Voice. Broad repertoire of sweet, mellow, minor-key piping whistles and sharper calls. Staccato, jerky-sounding song sounds like "cherkit-cherkit, chink-ut, chink-ut", first 2 notes low and subdued, others alternating and ending lowest. Other vocalizations include series of short, quavering, rising and then falling notes, "puwit puwit puwit-wit-wit"; quavering, gradually rising mellow "pu'u-pu'u-pu'u-pu-Wit!"; low, mellow, plaintive whistles, singly or in pairs (with second note slightly higher and louder than first); occasionally, similar-toned "dut, tud-durt" or a series of subdued, slightly guttural "prrt, prrt, prrt". Calls also include hard, rapid whipcrack notes in short series, sometimes combined with short mellow whistles.
Habitat. Open woodland, second growth at various stages of regeneration, luxuriant forest, gallery forest, forest edge and adjacent gardens; prefers broken, patchy forest to intact forest. Level lowlands and low hills of wet and intermediate zones, to at least 1200 m.
Food and Feeding. Thought to be mainly insectivorous; also eats small berries and seeds. Snails and minute ammonites have been found in stomachs of specimens. A confiding, active species, almost always in pairs, sometimes in small (family?) groups of 3–4 individuals; sometimes associates with *P. luteolus* and *Acritillas indica*. Often makes hovering sallies for insects.
Breeding. Breeds Mar–Sept; probably double-brooded. Nest a small flimsy cup, usually loosely constructed, made of fine roots, grass, creeper tendrils, and small twigs, interlaced with dead leaves, bound with spider webs, lined with fine grasses, placed 1–3 m above ground among dense foliage, often in upright fork of bush close to the ground, or even on stump; one nest was slung hammock-like between branches of a horizontal fork, but this seems to be unusual. Normal clutch 2–3 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally common, one of the commonest forest birds in Sri Lanka. Generally absent from arid sector, but occurs in several protected areas, including Peak Wilderness Sanctuary.
Bibliography. Ali (1996), Ali & Ripley (1996), Butler (1896), Deignan (1948b), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Grimmett *et al.* (1998), Harrison (1999), Henry (1998a), Hoffmann (1998), Hume (1878b), Jones *et al.* (1998), Kotagama (1985a, 1985b), Lamsfuss (1998), Legge (1983), Lewis (1898), Ranawana & Bambaradeniya (1998), Rasmussen & Anderton (2005), Ripley (1982), Walden (1866).

15. **Bornean Bulbul**

Pycnonotus montis

French: Bulbul de Bornéo **German**: Borneo-Goldbrustbülbül **Spanish**: Bulbul de Borneo

Taxonomy. *Rubigula montis* Sharpe, 1879, Kinabalu, north Borneo.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. flaviventris*, *P. dispar*, *P. gularis* and *P. melanicterus*, and all five usually treated as conspecific. All may merit placement in a separate genus, *Rubigula*. Monotypic.
Distribution. Borneo, except S and coastal areas.



Descriptive notes. 17–18 cm. Medium-small, active, conspicuous bulbul with slightly elongated crest feathers (raised when bird excited). Head is dull black, upperparts dull olive; wings and tail browner, with yellow-olive fringing; throat whitish-yellow, merging into bright olive-yellow underparts, yellower on belly and vent (less yellow than *P. melanicterus*); iris dark red-brown (whitish under lid); bill fairly slender, black; legs dark grey. Sexes alike. Juvenile undescribed, probably duller and browner then adult and with dull iris. Voice. Constantly given sharp "yek, yek". Song said to resemble that of *P. melanicterus*.

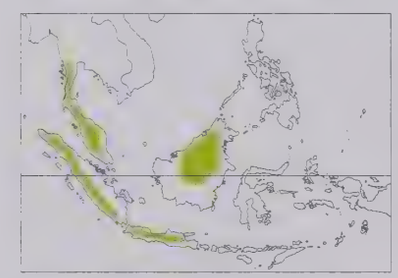
Habitat. Evergreen forest, secondary forest, and shrubby regrowth on abandoned cultivation; 600–1500 m.
Food and Feeding. An arboreal frugivore and partial insectivore. Eats fruit of *Macaranga* (Euphorbiaceae) less than 4 mm in diameter, also *Trema orientalis* and *T. tomentosa* (Ulmaceae), *Litsea* (Lauraceae); berries generally swallowed whole, but one individual seen to squeeze small black seeds from watery flesh of capsules of *Homolanthus* (Euphorbiaceae). Often perches in open at forest edges. Regularly performs aerial sallies to capture flying insects.
Breeding. Little known. Nest with 2 fresh eggs found at 1200 m in late Jan; nest a deep cup of dry stems and leaves, similar to that of *P. goiavier* but looser. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Not evaluated. Seems relatively scarce in E Bornean highland forest (particularly around Gunung Kinabalu), but more common and conspicuous in other areas; locally abundant in Trusan and Kelabit Highlands. Likely to be secure, given its reliance on mid-altitude degraded forest.
Bibliography. Amadon & Harrisson (1957), van Balen & Nurwatha (1997), Dickinson *et al.* (2002b), Jenkins *et al.* (1996), MacKinnon & Phillipps (1993), Smythies (1957, 1999), Strange (2002), Wilkinson, Dutson, Sheldon *et al.* (1991).

16. Scaly-breasted Bulbul

Pycnonotus squamatus

French: Bulbul écaillé **German**: Schuppenbülbül **Spanish**: Bulbul Escamoso

Taxonomy. *Ixos squamatus* Temminck, 1828, Java.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species was previously placed with *P. cyaniventris* in a separate genus *Ixidia*; given the strong morphological, behavioural and vocal differences from "typical" members of current genus (i.e. the "*P. capensis* complex" and the "*P. cafer* complex"), may be better returned to former genus or placed in resurrected *Brachypodius*. Name of race *webberi* sometimes emended to *weberi*, which tallies with name of collector; as current spelling appears in type description and has never been formally corrected, however, it should be retained. Three subspecies recognized.
Subspecies and Distribution.
P. s. webberi (Hume, 1879) – extreme S Myanamar (extreme S Tenasserim), S Thailand, Peninsular Malaysia (including Langkawi) and Sumatra.
P. s. squamatus (Temminck, 1828) – Java.
P. s. borneensis Chasen, 1941 – Borneo.



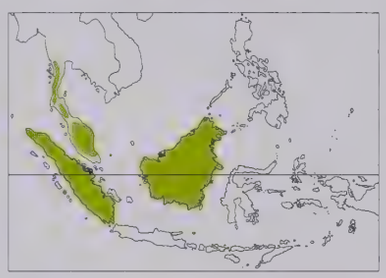
Descriptive notes. 14–16 cm ; 19–23 g (*webberi*), 22–24 g (*borneensis*). Small, quiet, strikingly patterned bulbul with relatively slender bill. Nominate race has lores, cheeks, ear-coverts, crown and nape solid black, contrasting sharply with pure white throat; mantle dusky olive, greener on rump; wings dark brown with bright olive fringing; tail black, conspicuous white tips of all except central pair of rectrices; white of throat sharply demarcated from breast and flanks, which are black with conspicuous white fringes, producing distinctive scaled effect (pattern and density of breast markings individually variable); belly whitish, undertail-coverts bright yellow; iris crimson or ochre (yellow or orange-yellow in some birds, presumably related to age or sex); bill black; legs black. Sexes alike, male perhaps on average darker. Juvenile (only recently described, from a single field observation in Peninsular Malaysia) similar to adult, but with black of upper breast smudgy, lower breast whiter, eyes duller. Race *webberi* has upperparts darker and more olivaceous than nominate, outer tail feathers with larger white tips, lower abdomen more prominently scaled, greyish flanks with less prominent scaling; *borneensis* differs from previous in slightly smaller size (although published weights on average heavier), upperparts more bronze-green and less olive-green, and uppertail-coverts more golden, less yellowish-green. Voice. Calls frequently while foraging, with a series of sharp high-pitched "wit" or "tit" notes. Only other vocalizations noted are thin, cheeping "tree", persistent "trrip, trip" and a "pretty trill", repeated at intervals at different pitches. These descriptions perhaps amount to basically the same sound.
Habitat. Broadleaf evergreen forest, either mature or disturbed, but with tall cover remaining or well regenerated; has also been recorded in quite low secondary growth, including bamboo jungle, well clear of original forest. Sometimes at plains level, but generally scarce in level lowlands, and more common in hilly country between 500 m and 1000 m; highest elevational record at 1400 m (Peninsular Malaysia).
Food and Feeding. Frugivorous, apparently also insectivorous. Feeds on wide variety of berries and other small fruits, including figs (*Ficus*), *Trema orientalis* (Ulmaceae), *Callicarpa candicans* (Verbenaceae); figs identified in diet include banyans (*F. benjamina* or *F. microcarpa*), *F. virens*, *F. glabella* and *F. sumatrana*. Small bill suggests that this species targets fruit in smaller size-classes. Usually found in canopy or high edges, either singly or in small independent groups, less often accompanying canopy flocks. In one study at Gombak, in Peninsular Malaysia, was noted in 20 of 80 mixed flocks; usually, however, it moved independently of flocks and joined them only temporarily. One exceptional report of 150 at a single fruiting tree, but gatherings of this size seem unlikely. Able to hover briefly, but only evidence of interest in animal prey is the regular attendance of mixed-species foraging flocks in canopy. Seen to drink and bathe at forest streams in Sumatra.
Breeding. Poorly known. One dependent fledgling in Peninsular Malaysia on 21st Jul. Nest undescribed; probably builds in canopy or subcanopy. Reported clutch contained 2 eggs. No other information.
Movements. None reported, but fluctuating numbers at sites suggest some form of movement, local or otherwise.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Widespread and locally fairly common in foothill forest, a habitat under less pressure than lowland forest in its range; seems to be particularly scarce and patchily distributed in Borneo. The catastrophic clearance of primary forest in Sundaic region must be causing drastic declines in this species' population, but its occurrence on submontane slopes (where forest cover remains extensive) suggests that it is under no immediate threat of extinction. Occurs in several important protected areas, including Hala-Bala Wildlife Sanctuary, in Thailand, Kerinci-Seblat National Park, in Sumatra, and Mount Kinabalu National Park, in Borneo.
Bibliography. van Balen (1999), Büttikofer (1887), Chasen & Hoogerwerf (1941), Collar *et al.* (2001), Davison (1987, 1997b), Davison & Chew Yen Fook (1996), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Gibson-Hill (1949), Gregory-Smith (1997a), Holmes (1996, 1997), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), McClure (1966, 1967), Medway & Wells (1976), Mitra & Sheldon (1993), Rheindt (2004), Riley (1938), Robson (2000, 2004), Smythies (1957, 1986, 1999), Stattersfield & Capper (2000), Wells (2005).

17. Grey-bellied Bulbul

Pycnonotus cyaniventris

French: Bulbul à ventre gris **German**: Graubauchbülbül **Spanish**: Bulbul Ventrigrís

Taxonomy. *P[ycnonotus]. ? cyaniventris* Blyth, 1842, Singapore.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species was previously placed with *P. squamatus* in a separate genus *Ixidia*; given the strong morphological, behavioural and vocal differences from "typical" members of current genus (i.e. the "*P. capensis* complex" and the "*P. cafer* complex"), may be better returned to former genus or placed in resurrected *Brachypodius*. The names "*aureum*" and "*poliopsis*" are junior synonyms of nominate race. Two subspecies recognized.
Subspecies and Distribution.
P. c. cyaniventris Blyth 1842 – extreme S Myanmar (S Tenasserim), S Thailand, Peninsular Malaysia and Sumatra (including Sipura I).
P. c. paroticalis (Sharpe, 1878) – Borneo.



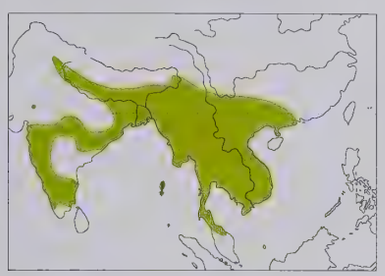
Descriptive notes. 16–17 cm; 19–24 g. Medium-small, relatively quiet, inconspicuous bulbul. Male nominate race has blackish lores, contrasting with pale grey supraloral line; rest of head to neck slaty blue-grey, mantle to uppertail-coverts bright golden-olive; wings blackish-brown with bright yellow-olive fringing (brighter and yellower than rest of upperparts); tail dark brown with dull olive fringing (no black or yellow); chin, throat and most of underparts slaty blue-grey, centre of belly white, undertail-coverts chrome-yellow, thighs sooty olive, underwing-coverts yellow; iris blue-grey, dark chocolate-brown or slaty grey-brown (age-related or sex-related?); bill blackish-horn; legs black or slaty grey, claws horn-brown, sometimes almost black. Female is slightly paler grey and duller yellow. Juvenile undescribed, but birds with pale brown or brownish-grey irides presumed to be immature. Race *paroticalis* is somewhat larger than nominate, also slightly brighter, especially on wing-coverts, which have bright golden-yellow margins, pale superciliary streak more conspicuous, partly because cheeks and ear-coverts are blacker. Voice. Clear sweet notes given in series of up to 9, sounding like "pi-pi-pwi..., pi-pi-pwi-pwi..." etc., similar to those made by minivets (*Pericrocotus*); subdued "wit wit wit" contact calls, and slightly descending bubbling, trilled whistle, "pi-pi-pi-pi-pi-pi-pi", also heard; another infrequently given call is distinctive "clewk".
Habitat. Broadleaf evergreen forest, mature, well regenerated or with much tall timber left standing after disturbance; often found at forest edges beside clearings, roads and rivers. Usually avoids plantations or any other non-native tree habitats. Occurs in level lowlands, but usually commoner in hilly country from 400 m upwards; recorded upper limit of 1070 m in Peninsular Malaysia.
Food and Feeding. Frugivore; said to be partial insectivore, and attendance of mixed-species flocks suggests that this is the case, but no direct observations of insects being taken. Eats fruits of tall evergreen trees, including *Macaranga*, *Trema orientalis*, rhododendrons (e.g. *Melastoma malabathricum*), figs (*Ficus*, including *F. benjamina*, *F. microcarpa*, *F. glabella*, *F. sumatrana*), euphorbs (e.g. *Mallotus* cf. *paniculatus*). In study at at Kuala Lompat, in Peninsular Malaysia, visited twelve of 25 bird-eaten *Ficus* species, all of them with mean minimum fruit diameter in range 5·4–15·5 mm. Two fledglings in Peninsular Malaysia were fed with fruits of the introduced shrub *Clidemia hirta*. Loners less usual than are pairs or small, typically single-figure parties. Usually keeps to tree canopy, often accompanying *P. squamatus*, or mixed-species flocks of insectivores, sunbirds (Aegithalidae) and flowerpeckers (Dicaeidae); regularly visits berry-laden trees along with other frugivores, especially barbets (of genus *Megalaima*). One patch of fruiting riverside banyans was visited by a party that returned on approximately 90-minute cycle. Seems more dextrous and active than most bulbuls, frequently hanging in manner of a tit (Paridae) to reach berries, and changing perch often.
Breeding. Usually breeds Dec–Mar; eggs found in late Jan, dependent fledglings mid-May in Peninsular Malaysia; also Aug and Nov in Borneo. Cup-shaped nest built from dead grass, moss and other plant material, usually placed low down in vegetation, once among leaves caught on suspended liana 4 m up in disturbed forest. Usual clutch 2–3 eggs; no information on incubation and fledging periods; both pair-members tend fledglings, fledged broods of two reported.
Movements. None reported, but likely to be mobile (as most other frugivorous forest-based members of genus).
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Locally fairly common or common throughout much of range, particularly Peninsular Malaysia and Sumatra; rare in S tip of Myanmar, at least historically, and generally uncommon in Borneo. The catastrophic clearance of lowland primary forest in Sundaic region is presumably causing drastic declines in the population of this species, but its occurrence on submontane slopes suggests that it is under no immediate threat of extinction. Has been recorded in variety of protected areas, including Hala-Bala Wildlife Sanctuary, in Thailand, Kerinci-Seblat National Park, in Sumatra, and Kutai and Tanjung Puting National Parks, in Borneo (Kalimantan).
Bibliography. Büttikofer (1887), Collar *et al.* (2001), Danielsen & Heegaard (1995), Davison (1987), Dickinson *et al.* (2002b), Duckworth & Kelsh (1998), Duckworth *et al.* (1996), Gibson-Hill (1949), Glenister (1971), Holmes (1994, 1997), Hose (1893), Hume & Davison (1878), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), McClure (1966), Medway & Wells (1976), Nash & Nash (1988), Riley (1938), Robson (1991a, 2000), Smythies (1957, 1986, 1999), Stattersfield & Capper (2000), Thompson (1966), Vowles & Vowles (1997), Wells (1990b, 2005).

18. Red-whiskered Bulbul

Pycnonotus jocosus

French: Bulbul orphée **German**: Rotohrbülbül **Spanish**: Bulbul Orfeo

Taxonomy. [*Lanius*] *jocosus* Linnaeus, 1758, Guangzhou, Guangdong, south China.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species may merit placement in a separate genus, *Otocompsa* (currently a subgenus). S China race *hainanensis* was initially assumed to relate to escaped cagebirds (there is no wild population on Hainan). Described Indian races *provincialis* (Uttar Pradesh) and *erythrotis* (West Bengal), and *peguensis* (from Myanmar), considered insufficiently distinct to justify recognition; thus, the first is merged with *pyrrhotis* and the last two with *emeria*. Racial identity of Laos population uncertain, tentatively included in *pattani*. Nine subspecies recognized.
Subspecies and Distribution.
P. j. abuensis (Whistler, 1931) – NW India (W Rajasthan, N Maharashtra, but absent from more arid areas).
P. j. fuscicaudatus (Gould, 1866) – W & C India.
P. j. pyrrhotis (Bonaparte, 1850) – N India (Punjab E to Arunachal Pradesh) and Nepal.
P. j. emeria (Linnaeus, 1758) – E India (Ganges Delta S to Rameswaram, in Tamil Nadu), Bangladesh, N, W & S Myanmar (including Arakan Hills) and SW Thailand.
P. j. whistleri Deignan, 1948 – Andaman Is.
P. j. monticola (Horsfield, 1840) – E Himalayas in NE India and S Tibet E to N Myanmar and S China (W & S Yunnan).
P. j. pattani Deignan, 1948 – extreme S Myanmar (S Tenasserim), Thailand, N Peninsular Malaysia, Laos and S Indochina.
P. j. hainanensis (Hachisuka, 1939) – N Vietnam and S China (S Guangdong, including Nao Chow Tao).
P. j. jocosus (Linneaus, 1758) – SE China (Guizhou E to Guangxi, E Guangdong and Hong Kong). Introduced (races unknown) in E Saudi Arabia, United Arab Emirates, Oman, Mauritius, Nicobar Is, Malaysia (Kuala Lumpur, Melaka and Penang), Singapore, Borneo (Brunei), E Australia, Hawaii (Oahu) and SE USA (Florida).



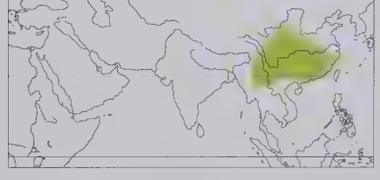
Descriptive notes. 18–20·5 cm; 25–31 g. Slim, dark-backed, conspicuous bulbul with long crest, which often held upright. Nominate race has black crown and crest, bright red spot behind eye ("ear-tuft"), white ear-coverts, cheek and throat, fine black moustachial line; upperparts, wings and tail dull brown, all tail feathers except two central pairs tipped white; underparts whitish, washed brownish on sides, broad black pectoral band variably complete (usually broken), undertail-coverts red; iris brown or dark brown; bill black; legs and claws black. Sexes similar. Juvenile has shorter, browner crest, red postocular tuft replaced by white, paler brown upperparts, much weaker breastband, undertail-coverts suffused with pink, and vent dull buffish-pink to yellowish or orange. Race *fuscicaudatus* has breastband complete, lacks white tips on lateral tail feathers; *abuensis* is similar to previous but paler overall, with breastband incomplete; *pyrrhotis* has all tail tips white, breastband incomplete, upperparts pale brown; *emeria* has upperparts bright warm brown, crest very long, bill slim; *whistleri* is similar to last but slightly smaller, with crest shorter and bill larger; *monticola* is darker and more saturated overall, with flanks and lower abdomen smoky buff, ear-tufts small and deep crimson (composed of more rigid and wiry feathers), dark breastband complete; *pattani* has upperparts cold greyish-brown, ear-tufts short and dark red, white tips of tail feathers conspicuous; *hainanensis* has flanks, lower and upper abdomen, breast and lower throat smoky buff, ear-tufts small and rather dark. Voice. Song short and spirited, often second main note highest and loudest, thereafter descending in pitch; similar in pattern to that of *P. cafer* but much more rich and complex, lacking harsh or guttural notes; longer songs rise and fall twice, "wit-ti-waet, queep kwil-ya, queek-kay". Calls include first 2 notes of the song, e.g. "queee-kwut", and other song fragments; also short harsh raspy "bzeep", sometimes introducing song. Anxious, querulous, musical "pr'r" or "per'r'p" also heard, usually during extended communal period prior to roosting.
Habitat. Wide range of habitats, including dense hilly woodland, secondary scrub, roadsides, parkland, orchards, reedbeds, urban and suburban gardens and parks; found also in cultivation, ranging from slash-and-burn clearings in secondary forest to totally open sugar-cane plantation. Absent from intact forest, and commonest near humans. In India, generally confined to wetter, more evergreen areas than those utilized by *P. leucogenys* and *P. cafer*. In most of range occurs commonly up to 1000 m, and regularly to c. 2000 m; in Peninsular Malaysia restricted to lowland plains, including up to landward edge of coastal mangroves.
Food and Feeding. Generalist and opportunist; feeds on fruit (fond of *Lantana* berries), nectar, flower buds, and invertebrates; around habitations, takes kitchen waste and visits birdtables. Observed to harvest fruit of figs (*Ficus*), *Macaranga* (Euphorbiaceae), *Muntingia calabura*, and arils of *Acacia mangium* seeds. Visits the flowers of *Careya arborea* (a tree flowering in dry season in Eastern Ghats) to feed on nectar; also collects nectar from *Erythrina* (Fabaceae) and *Spathodea campanulata* (Bignoniaceae). Individuals reported also as eating flowers (e.g. of *Tabernaemontana divaricata*). Takes many arthropods, notably caterpillars, but also grasshoppers (Orthoptera), beetles (Coleoptera), arachnids etc.; sometimes hawks alate termites (Isoptera) and moths (Lepidoptera). Young nestlings tend to be fed with soft-bodied insects and larvae, with more drupes and berries as they become a little older. Usually encountered singly, in pairs or in small, family-sized parties; outside breeding season larger foraging parties form (regularly up to 30 individuals, rarely 100). Communal roosts of over 1000 reported in Myanmar. Most foraging takes place in trees and bushes, but descends fairly often to ground, where it shuffles about on short legs to pick up seeds and ants etc. Often jaunty, with flight oddly slow and jerky.
Breeding. In India, breeds Mar–Oct in N and variably throughout year (mostly Dec–May) in S; Apr–May in Andamans and N Thailand; Feb–Jul in Peninsular Malaysia. Male (and possibly female) displays by lowering head, drooping and quivering wings, and slowly raising and lowering fanned tail. Nest a fairly deep, compact, substantial open cup composed of twigs, leaves (including leaf skeletons and bamboo leaves), dry grasses, creeper stems and flakes of bark, bound together with cobwebs, inner cup usually lined with fine hair-like rootlets (e.g. of the climbing fern *Drymoglossum heterophyllum*), coconut fibres, thin grass and mammalian hair, with dead leaves and dried ferns worked into base, man-made items such as pieces of cloth and paper often incorporated (in nests in villages), external dimensions 10 cm across and 7·5 cm deep, internal dimensions 5·6–6·4 cm × 3·8 cm; usually placed 1–3 m (0–4·5 m) above ground (average height exceeding that of *P. cafer* and *P. aurigaster*) in branch fork of bush, thorny shrub, hedge or tree, including rubber (*Hevea*), *Saracca* and *Lagerstroemia*, but sometimes virtually on ground, also in dense-foliaged exotic conifer, bamboo, or creepers against tree, wall or garden lattice, sometimes in odd situation such as on verandah, in basket, within building, roof thatching or stack of straw, or even down well, and once (Andamans) in mangrove by water. Clutch 2–4 eggs, usually 3; incubation may start with first egg, but intermittent (and only diurnal) until clutch complete, incubation period 12–14 days, hatching sometimes asynchronous; nestlings tended by both pair-members, fledging period unrecorded in wild, maximum 14 days in captivity; both parents also tend fledglings, for recorded maximum of 34 days, juveniles stayed together for further 13 days. Heavy predation on nests reported.
Movements. Essentially resident over much of range, but subject to apparently unpredictable invasive or irruptive movements (sometimes in loose flocks containing hundreds of individuals), and curiously patchy in local distribution and habitat occupancy. Roosts communally in non-breeding season.
Status and Conservation. Not globally threatened. Common in many regions. Abundant in S & W India, and common (at least historically) in NE India; very common in Hong Kong, where possibly introduced (was absent or rare in 1800s, increasing through 1900s); common in Bangladesh; previously common in S Myanmar (current status unknown); common in rural Laos; fairly common in S China. Common in many parts of its non-native range; e.g. in Nicobars has become abundant, replacing sparrows (*Passer*) as the bird of towns and buildings, and possibly outcompeting the endemic pycnonotid (*Ixos nicobariensis*) such that the latter is now threatened. Because it is commensal with man, benefits from clearance of forest and is tolerant of heavily degraded habitat. In SE Asia, however, this species is increasingly threatened by hunting and trapping, and in Thailand and N Peninsular Malaysia has been extirpated over large tracts of land in which it was formerly very common; until recently remained common in N Thailand, but recent dramatic declines reported, possibly following an upsurge in popularity of singing contests, and concomitant trapping of birds for this use. Programmes promoting awareness are required, and monitoring schemes needed to track shifts in status. This species is considered an agricultural pest in some regions, where it frequently damages ripening crops (e.g. peas) or buds in fruit orchards.
Bibliography. Aitken (1902), Ali (1932, 1969), Ali & Ripley (1996), Ali & Whistler (1933), Ali *et al.* (1996), Ball (1874, 1878), Barnes (1889), Barré *et al.* (1998), Begbie (1908), Berwick (1952), Betts (1931), Blyth (1866–1867), Butler (1899), Carey *et al.* (2001), Cheng Tsohsin (1987), Clergeau & Mandon-Dalger (2001), Cook (1912), Corlett (1998), D'Abreu (1912), Daltry & Momberg (2000), Davidson (1998), Davison (1883), Declair (2002), Deignan (1945, 1948c), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Fairbank (1877), Ferguson & Bourdillon (1903–1904), Field (1922), Ford & Davison (1995), Fraser (1930), Frith (1981a), Gibson-Hill (1949), Gill (1922–1925), Grimmett *et al.* (1998), Harington (1909a, 1909b), Harvey (1990), Higgins *et al.* (2005), Hollom *et al.* (1988), Hopwood (1912), Hume (1873b, 1874, 1875, 1888), Hume & Davison (1878), Inglis (1896, 1901), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Kanjanavanit (2000), Kinloch (1922), Lainer (1999), Lever (1987), Llewellyn (1958), Macdonald (1906), MacKinnon & Phillipps (1993, 2000), Mandon-Dalger *et al.* (1999), Mears & Oates (1907), Medway & Wells (1976), Meyer de Schauensee (1934, 1984), Mukherjee (1995), Oates (1882, 1895), Osmaston (1906), Oustalet (1903), Pande (2003), Pleimann (2004), Rasmussen & Anderton (2005), Riley (1938), Ripley *et al.* (1988), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993b), Saha & Dasgupta (1992), Santharam (1997), Siromoney (1963), Skerrett *et al.* (2001), Smythies (1986, 1999), Solomon Raju *et al.* (2004), Stanford & Mayr (1940–1941), Stanford & Ticehurst (1931), Stepanyan (1995), Stuart Baker (1922–1930), Wells (2005), Whistler & Kinnear (1932), Wickham (1929–1930), Wood (1999), Zheng Guangmei & Zhang Cizu (2002).

19. Brown-breasted Bulbul

Pycnonotus xanthorrhous

French: Bulbul à poitrine brune **German**: Braunbrustbülbül **Spanish**: Bulbul Pechipardo
Other common names: Anderson's Bulbul

Taxonomy. *Pycnonotus xanthorrhous* Anderson, 1869, Manyun, near Lienshan, west Yunnan, China.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species perhaps merits placement in a separate genus, *Otocompsa* (currently a subgenus). Validity of race *andersoni* questionable, as its purported characters (shade of plumage, extent of breastband) are to large extent due to wear, fading and specimen preparation; intergrades said to occur where it overlaps with nominate in S China (N & SE Yunnan). Two subspecies provisionally recognized.
Subspecies and Distribution.
P. x. andersoni (Swinhoe, 1870) – C & S China (SE Gansu, Sichuan and N Yunnan E to S Jiangsu, Zhejiang, Jiangxi and Fujian, S to N Guangdong).
P. x. xanthorrhous Anderson, 1869 – SE Tibet, S China (SE Sichuan, Guizhou and SW Hunan S to S Yunnan and the Yao Shan, in Guangxi), N & E Myanmar (including Ruby Mines district and Southern Shan States), NE Thailand, N Laos and N Vietnam (W Tonkin).



Descriptive notes. 20 cm; 24–31 g. Medium-large, noisy, conspicuous bulbul. Crown to below eyes, nape, lores and moustachial streak are black; minute blood-coloured spot at base of lower mandible; ear-coverts, hindneck, neck side in front of wing bend, and mantle to uppertail-coverts soft greyish-brown; wings and tail darker greyish-brown, lightly margined brownish-olive, tail feathers with narrow white tips (often lost through abrasion); chin, throat, lower breast and belly white, contrasting with sharply defined brown breastband, narrower at centre; flanks and lower belly slightly sullied with pale greyish-brown; undertail-coverts deep yellow or orange-yellow; iris brown to dark brown; bill black; legs dark brown to blackish. Sexes alike. Juvenile is somewhat duller, with less distinct breastband, browner head markings, paler upperparts. Race *andersoni* lacks or virtually lacks breastband, and is marginally paler. Voice. Song a repeated quick simple "chirriwu'i whi'chu whirri'ui" etc. Calls with harsh "chi" or "brzzp" notes and thinner "ti-whi".
Habitat. Secondary growth, scrub, tall grass, gardens, thickets, clearings and streamside vegetation in montane zone. Fond of bramble (*Rubus*) and bracken-covered hillsides, often with scattered trees, but usually fairly open; in Myanmar and N Thailand replaced by *P. flavescens* in denser or taller vegetation. Usually at 1000–2300 m, sometimes as low as 600 m, and recorded up to 4275 m in S China (N Yunnan).
Food and Feeding. Fruit, also seeds, and insects. Individuals in Myanmar seen to pluck fruit from variety of plants, including *Heptapleurum* (Araliaceae), "carmine cherry" and wild raspberry (*Rubus*).
Breeding. Season Apr–Aug, mainly May–Jun. Builds typical cup-shaped nest, usually fairly loose but sometimes more compact, usually c.1 m up in low vegetation, e.g. in brambles, among grass and weeds, or in bracken (Dennstaedtiaceae). Clutch 2–4 eggs, usually 2. No other information.

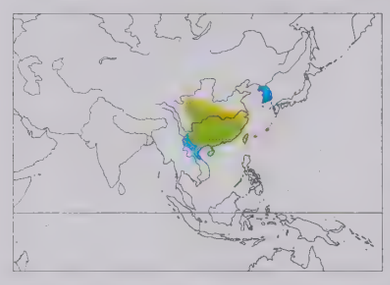
Movements. Resident; possibly shifts downslope during winter, at least in harsh conditions.
Status and Conservation. Not globally threatened. Locally common across a broad range. Abounds in agricultural landscapes in S China (e.g. Guizhou), and is fairly common in much of Myanmar (e.g. Bhamo district, Ruby Mines). Tolerates highly degraded habitats.
Bibliography. Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Davidson (1998), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Harington (1905, 1909a), Lekagul & Round (1991), Lewthwaite (1996), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Nguyen Cu *et al.* (2000), Oates (1895), Pershouse (1916), Rippon (1896), Robson (2000), Rothschild (1921), Smythies (1986), Stanford & Mayr (1940–1941), Traylor (1967), Yen (1934), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002).

20. **Light-vented Bulbul**

Pycnonotus sinensis

French: Bulbul de Chine **German**: Chinabülbül **Spanish**: Bulbul Chino
Other common names: Chinese Bulbul

Taxonomy. [*Muscicapa*] *sinensis* J. F.Gmelin, 1789, Guangzhou, Guangdong, south China.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species perhaps merits placement in a separate genus, *Otocompsa* (currently a subgenus). Closely related to, and often interbreeds with, *P. taivanus*; latter probably arose from an early colonization of Taiwan by present species, with contact between the two forms resumed after a secondary invasion. As nominate race and *hainanus* both occur on Hainan, some authors have treated these as separate species; their breeding ranges, however, do not overlap. Putative race *kobayashii* (Ishigakijima, in S Ryukyu Is) is indistinguishable from *orii*; *hoyi* (middle Yangtze Valley) was described from a juvenile specimen, and is a junior synonym of nominate. Four subspecies recognized.
Subspecies and Distribution.
P. s. sinensis (J. F. Gmelin, 1789) – C & E China (Sichuan and S Shaanxi E to mouth of R Yangtze, S through Guangxi, Guangdong and Fujian; also isolated sites in Beijing and Hebei); non-breeding N & C Vietnam, Hainan and South Korea.
P. s. hainanus (Swinhoe, 1870) – SE China (Hainan, SE Guangdong) and N Vietnam; non-breeding S to C Vietnam.
P. s. formosae Hartert, 1910 – Taiwan (excluding S & E coast S of Taroko Gorge).
P. s. orii Nagamichi Kuroda 1923 – S Ryukyu Archipelago (Okinawa, Yaeyama Is).



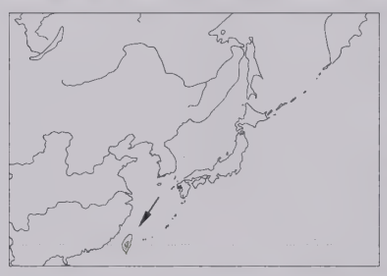
Descriptive notes. 19 cm. Medium-sized, noisy, conspicuous bulbul. Nominate race has striking head pattern, with black crown and moustachial stripe, broad white postocular stripes meeting to form band on upper nape (band narrower after post-nuptial moult, gradually widening with abrasion), white patch at rear of otherwise dark ear-coverts, white throat; upperparts greyish-brown, admixed with dull olive on mantle; wings and tail dark grey-brown, fringed with bright olive, outer tail feathers with narrow whitish fringe at tips; underparts whitish, pale grey-brown breastband (vaguely mottled), yellowish-grey belly and yellowish-white undertail-coverts (both indistinctly streaked darker); iris deep brown to blackish; bill black; legs black. Sexes similar. Juvenile has paler upperparts, entire head pale greyish-brown, breastband less distinct, wings and tail paler and duller, iris paler and greyer. Race *hainanus* lacks pale band from eye to nape, pale ear-covert spot smaller; *formosae* has white band on nape, relatively uniform and slightly greyer upperparts, darker grey breastband, and whiter rest of underparts with fewer, fainter yellow streaks; *orii* is similar to nominate, but has shorter wing, darker band on chest. Voice. Typical bulbul sounds in a range of cheerful phrases and strikingly peculiar notes, difficult to transcribe; calls frequently with loud "tocc-tocc-tocc". Groups said to produce low chattering, with individuals occasionally ascending to tops of bushes to give louder calls.
Habitat. Cultivation, borders of cultivation, orchards, gardens with large shrubs, scrub and open woodland; to 500 m.
Food and Feeding. Eats variety of berries, small figs (*Ficus*), soft fruit and vegetables; also insects, e.g. dipteran flies, sometimes caught in aerial pursuit. Often perches prominently on bushtops; gathers in large flocks in winter. Foraging behaviour generally poorly known.
Breeding. Breeds Apr–Jun, sometimes as late as Oct; multi-brooded, often 3–4 nests per season. Nest a firm cup-shaped structure, usually constructed from broad grasses, lined with finer grass and rootlets, variety of other materials (including scraps of cotton, paper, cloth, leaves, leaf skeletons, flowers and feathers) sometimes incorporated, nests in Taiwan reported as made largely of swordgrass (*Brachiaria decumbens*) flower spikes (with down still attached), leaves and bamboo leaves and lined with stripped swordgrass flower spikes; usually placed 1–3 m, occasionally at least 6 m, above ground in upright fork of bush, hedge or creeper, sometimes between intersecting branches of bamboo, at times in close proximity to man, e.g. nest found in honeysuckle (Loranthaceae) on sixth-floor verandah in Hong Kong apartment block. Clutch 3–4 eggs, rarely 5; no information on incubation and fledging periods.
Movements. Largely resident; migratory in N. Post-breeding movement S by N populations, with regular records in Hebei and on Shandong Peninsula. Large influx of nominate race in Hong Kong in non-breeding season; this race also recorded in flocks of up to 80 birds in winter in C Vietnam (along with smaller numbers of *hainanus*), and small numbers reach N Laos; a few winter in South Korea, where first record at Eocheong I (Jeollabuk Province) in Oct 2002. Race *hainanus* a winter vagrant in N Thailand and C Laos.
Status and Conservation. Not globally threatened. One of the commonest birds in S China, especially in cultivated and settled areas; abundant in many regions, including Hong Kong and also in parts of Taiwan. Being commensal with man, this species requires no conservation action; it is favoured by deforestation and tolerant of highly degraded habitats. For this reason, its range is spreading: first recorded in Beidaihe, Hebei, in autumn 1986, it has subsequently become established there as a breeding species; colonized S Japan (Ryukyus) in 1900s, and now a common breeding resident in the region. Also a common winter visitor in N Indochina. Causes some damage to garden crops (tomatoes, peas and others) in China, and to other commercial crops in Okinawa, in S Japan.
Bibliography. Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Chang James Wanfu (1993), Cheng Tsohsin (1987), Collar (2004c), Corlett (1998), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Dymond (1998), Étchécopar & Hüe (1983), Hu Zhongxin (1983), Jiang Shiren *et al.* (1994), Kinjo *et al.* (1987), Kuroda (1923), La Touche (1898), Lewthwaite (1996), Li Binghua (1981), Liu Xiaohua & Long Guozhen (1986), MacKinnon & Hicks (1996), MacKinnon & Phillipps (2000), Mauersberger & Fischer (1992), Meyer de Schauensee (1984), Nakamura & Hanawa (1987), Oustalet (1903), Pang Bingzhang (1981), Riley (1923), Robson (1992, 2000, 2002b), Robson *et al.* (1993a, 1993b), Severinghaus, L.L. & YenMin Kuo (1994a, 1994b), Severinghaus, S.R. (1978), Swinhoe (1863), Traylor (1967), Webster (1975), Wilkinson (1929), Yamasaki (2002), Yan Anhou (1985), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002).

21. **Styan's Bulbul**

Pycnonotus taivanus

French: Bulbul de Taiwan **German**: Taiwanbülbül **Spanish**: Bulbul de Taiwan
Other common names: Taiwan/Formosa Bulbul

Taxonomy. *Pycnonotus taivanus* Styan, 1893, Taiwan.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species perhaps merits placement in a separate genus, *Otocompsa* (currently a subgenus). Closely related to, and often interbreeds with, *P. sinensis*; probably arose from an early colonization of Taiwan by that species, with contact between the two forms resumed after a secondary invasion by it. Monotypic.
Distribution. E coast of Taiwan S of Taroko Gorge (including Hengchun Peninsula).



Descriptive notes. 19 cm. Medium-sized, conspicuous bulbul with stout bill. Has cap and moustachial streak black, small orange-red spot at base of lower mandible; lores and ear-coverts silvery buff; hindneck light brown, mantle dull ashy brown, lightly washed with olive; wings and tail dark brown, outer webs of remiges and rectrices fringed bright olive-yellow; buffish-white below, flanks and thighs washed with ashy brown, undertail-coverts white, edged olive; iris dark brown; bill black; legs dark brown. Sexes alike. Juvenile undescribed. Voice. Variety of vocalizations typical of genus, including short choppy cheerful strophes; also more continuous chattering, especially when in groups.
Habitat. Second growth, farms and developed areas in coastal lowlands.
Food and Feeding. Diet consists of fruit and flowers. Singly or in pairs when breeding, but forms large flocks in non-breeding season.
Breeding. Reported in Mar–Jul; at least two broods annually. Nest, built by female, a cup-shaped structure placed 0·8–5 m above ground in bush, or in low tree such as crabapple (*Malus*). Clutch 3–4 eggs, mean 3·3; incubation by female, period 11–12 days; male assists with provisioning of young, nestlings fledge 9–10 days after hatching.
Movements. Resident.
Status and Conservation. VULNERABLE. Restricted-range species: present in Taiwan EBA. Still common in many areas, but potentially threatened by hybridization with *P. sinensis*; hybrid pairs quite common in areas of contact, and produce viable offspring. Historical records reveal that the vast Ilan Plains in NE Taiwan were once occupied by present species; it has since disappeared from this area, and its range continues to contract in the face of competition with *P. sinensis*. It remains common in Kenting National Park, in S Taiwan, and part of this area should perhaps be established as a refuge for the species; active elimination of *P. sinensis* from such a refuge may prove necessary if its expansion continues. The range and population status of both species on Taiwan need to be closely monitored.
Bibliography. Anon. (1998a), Butchart & Stattersfield (2004), Chang James Wanfu (1993), Cheng Tsohsin (1987), Collar *et al.* (2001), Étchécopar & Hüe (1983), Fang Woeihorng (2004), Hachisuka & Udagawa (1950–1951), Hsu Minna & Lin YaoSung (1997), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Severinghaus, L.L. (1998), Severinghaus, L.L. & YenMin Kuo (1994a, 1994b), Severinghaus, S.R. (1978), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Yamashina & Yamada (1938), Zheng Guangmei & Zhang Cizu (2002).

PLATE 16 ➤



PLATE 16

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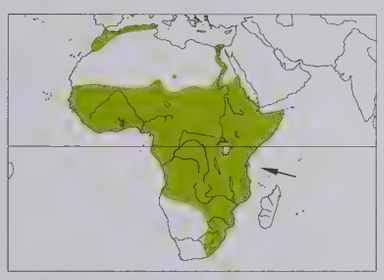
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22. Common Bulbul

Pycnonotus barbatus

French: Bulbul des jardins **German**: Graubülbül **Spanish**: Bulbul Naranjero
Other common names: Black-eyed/Black-capped Bulbul, Common Garden Bulbul; Somali Bulbul (*somaliensis*); Dodson's Bulbul, (African) White-eared Bulbul (*dodsoni*); Dark-capped/Yellow-vented(!)/Tricoloured Bulbul (*tricolor*); Egyptian Bulbul (*arsinoe*)

Taxonomy. *Turdus barbatus* Desfontaines, 1789, "Côtes de Barbarie" = near Algiers, Algeria.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. nigricans*, *P. capensis*, *P. xanthopygos*, *P. leucotis* and *P. leucogenys*, possibly including some other species. Hybridizes extensively with first two of these in narrow transition zones along at least part of boundaries between their respective distributions; old record of a mixed pair of present species and *P. xanthopygos*, but no hybrids known (and ranges apparently do not meet). Races *tricolor*, *dodsoni* and *somaliensis* sometimes treated as separate species on basis of plumage differences (colour of head and undertail-coverts, presence or absence of white patch on neck side, and plain or mottled breast pattern), but intermediates known in many cases. The whole complex merits further study. Races *gabonensis* and *inornatus* intergrade in Nigeria; described races *nigeriae* (S Nigeria) and *goodi* (N Cameroon) not satisfactorily distinguishable from former and latter respectively. In addition, a number of other described races are too poorly marked to warrant recognition: thus, *minor* (upper White Nile and Bahr el Ghazal), *fayi* (Kenyan Highlands) and *ngamii* (L Ngami, in Botswana) merged with *tricolor*, *micrus* (SE Kenya) and *tenebrior* (Eastern Cape, in South Africa) with *layardi*, and *peasei* (Kitunga, in Kenya) with *dodsoni*. Ten subspecies recognized.
Subspecies and Distribution.
P. b. barbatus (Desfontaines, 1789) – Morocco E to Tunisia.
P. b. inornatus (Fraser, 1843) – S Mauritania and Senegal E to N Niger (Aïr), NW & W Chad, N Nigeria and N Cameroon.
P. b. gabonensis Sharpe, 1871 – C & S Nigeria and C Cameroon S to Gabon and S PRCongo.
P. b. tricolor (Hartlaub, 1862) – E Cameroon E to S Sudan, W & C Kenya and S to Angola, NW Botswana and N & W Zambia.
P. b. arsinoe (M. H. K. Lichtenstein, 1823) – Egypt (Nile Valley), Sudan (S to S Kordofan) and E Chad.
P. b. schoanus Neumann, 1905 – highlands of Eritrea and Ethiopia (S to NW Sidamo-Borama, E to Dire-Dawa and Harar) and extreme SE Sudan.
P. b. somaliensis Reichenow, 1905 – Djibouti, NW Somalia and SE Ethiopia (NE Bale, SE Arussi).
P. b. spurius Reichenow, 1905 – S Ethiopia (S Bale S to N Sidamo-Borama).
P. b. dodsoni Sharpe, 1895 – NC Somalia and E parts of lowland Ethiopia S to S Kenya (Chyulus, Tsavo).
P. b. layardi J. H. Gurney, Sr, 1879 – SE Kenya (Taveta) and E Tanzania (including Zanzibar) S to E & S Zambia, NE Botswana and E South Africa.



Descriptive notes. 15–20 cm; male 34–49·5 g, female 29–42 g (*layardi*). Conspicuous bulbul with slightly peaked crown, giving distinctive head shape. Nominate race has top of head, cheeks and ear-coverts dark brown, faint white spot (whitish feather bases) sometimes present on hind margin of ear-coverts; lores and feathering around eye blackish; upperparts dark grey-brown, often slightly paler on rump; wings as upperparts or slightly darker; tail black, some browner tinges on central pair of feathers and outer webs of other pairs; throat dark brown, becoming paler on to body, upper breast dark brownish-grey, lower breast and flanks paler brownish-grey, becoming dull grey on belly; undertail-coverts white, some feathers with indistinct greyish shaft streaks and yellowish margins; in worn plumage, face becomes browner, upperparts duller and more grey, breast somewhat browner, belly more whitish-grey, edges of tail and flight-feathers bleached; iris red-brown, brown or dark brown; bill black or blackish-horn; legs black, blackish-horn or brownish-horn. Sexes alike, female on average smaller. Juvenile is as adult, but face duller grey-brown, upperparts somewhat paler, undertail-coverts entirely white; feathering, particularly on rump and undertail-coverts, softer and looser. Race *inornatus* is similar to nominate, but underparts greyer, some faint paler edging on breast feathers, belly whiter, undertail-coverts white or cream; *arsinoe* has blackish head and throat, brown breast sharply demarcated from white belly, breast feathers with pale fringes, undertail-coverts white; *schoanus* is similar to previous, but upperparts rather darker, head blacker, pale ear-covert patch smaller or absent, breast darker; *spurius* resembles last, but undertail-coverts deep yellow; *somaliensis* is also similar but somewhat paler, with white ear-covert spot larger and more conspicuous, pale edges of breast feathers more pronounced (mottled appearance where brown of breast meets white of belly); *dodsoni* is like last but with yellow undertail-coverts, breast spotting more developed (reaching upper belly), tail feathers pale-tipped, also upperparts somewhat scaly-looking (pale feather tips); *gabonensis* is like nominate, but head and upperparts darker, breast darker and sharply demarcated from white belly, undertail-coverts white with varying amounts of yellow (N populations paler, S ones more yellow); *tricolor* resembles previous, but undertail-coverts bright yellow; *layardi* is similar to last, but crown, face and chin black, contrasting with greyish-brown upperparts. Voice. Song loud and deliberate, consisting of sequentially repeated phrases, each of 3–7 somewhat abrupt and disjointed notes, e.g. "wee! wee-hoo-hoo", "quick-chop-toquick", "chuk-chuk-twirlup" and "chip-chop-chip-kweeko" (sometimes transliterated as "quick, quick, doctor, quick!"), total duration 0·8–2 seconds, intervals between phrases 1–10 seconds but generally 3–6 seconds; fine structure of phrases infinitely variable across species' range, but individuals possess repertoire of 2–9 phrases and each phrase is shared by 1–25 males; repertoire variation between among territorial males highly structured locally, such that neighbours have similar repertoires but birds over 3 km apart share no phrases. Soft, swizzling chatter by birds in resting state. Contact calls consist of rapid jumble of 3–5 notes, the first generally high-pitched; when anxious a nasal "chirrik" or "jerdut", which escalates to loud, shrill alarm, e.g. "kik-kik-kik" (like machine-gun noise), when scolding a predator, often ending in "crescendo" call similar to contact. Chattering "cheedle-cheedle-cheedletit" during wing-flicking display by male in conflict situation, or as greeting call to female; pair-members often greet with short burst of soft chatter.
Habitat. Almost any wooded or bushy habitat with sufficient abundance of fruiting trees or shrubs; absent only from unbroken forest or woodland, open grassland with no bushes, and treeless desert. Particularly fond of riverine habitats, penetrating desert, forest and woodland along streams. Occupies forest edges, temporarily entering canopy of old secondary forest and primary forest when attracted by fruiting trees; particularly common where forest fragmented for human settlement and in first stages of regeneration, such as overgrown areas with *Musanga* and thickets of Solanaceae. Penetrates forested areas along logging roads; colonizes isolated clearings and camps within a few years of creation. Sparse or absent in virgin stands of *Brachystegia*, *Baikiaea* and mopane (*Colophospermum mopane*) woodland, but tolerates more open areas where other bushes present. At high altitude occurs in bamboo thicket, juniper (*Juniperus*) woods (Ethiopia), bracken-briar (Malawi) and dense *Leucosidea* scrub (South Africa). In all types of wooded savanna and parkland, thickets and scrub, including (N Africa) *macchia*. Enters semi-arid areas along wadis and streams, colonizes oases, palm groves and wells in Sahara. Lives in swamp-forest, also papyrus swamps with *Miscanthidium* and other marsh plants; recorded even in pure papyrus several kilometres from lakeshore. Found in plantations of introduced timber trees, and especially common in orchards, gardens, fallows and scrubby vegetation around human settlement. Sea-level to 1100 m in Egypt, to 1650 m in Liberia, 2300 m in Morocco, 2350 m in Malawi, 2500 m in Sudan (Jebel Marra), and at least 3000 m in Ethiopia and E Africa.
Food and Feeding. Mostly fruit, also arthropods, nectar, flowers and some seeds; a few small vertebrates. Eats almost any fruit available. In N Africa, fruit taken includes *Arbutus*, *Balanites*, *Elaeaginus*, *Ficus*, *Jasminum*, *Olea*, *Nerium*, *Pistacia*, *Ziziphus* and apricots, citrus, dates, pomegranates; more than 50 species recorded in single study in Zimbabwe, where *Ficus* particularly favoured, also *Boscia*, *Commiphora*, *Cucumis*, *Erythrococca*, *Lantana*, *Morinda*, *Musanga*, *Melia*, *Rapania*, *Rauwolfia*, *Solanum* (up to 13 mm in diameter), *Trema*, as well as apple, wild asparagus, avocado, guava, mango, oil palm, papaya, banana, peach, pear, plum etc.; in study in Malawi, 21 species of wild fruit (diameter 3–15 mm) taken, principal genera *Afrocrania*, *Bridelia*, *Croton*, *Cussonia*, *Ficus*, *Harungana*, *Ilex*, *Macaranga*, *Maesa*, *Myrica*, *Polyscias*, *Prunus*, *Rauwolfia*, *Sapium*, *Syzygium*, *Trema* and *Viscum*. Flower parts eaten include *Acacia*, *Aloe*, *Calothamnus*, *Celtis*, *Eucalyptus*, *Grevillea*, *Pinus*, *Prosopis* and *Protea*; nectar taken from *Aloe* and *Greyia*, and young leaves from *Acacia* and *Prosopis*. Arthropods include alate termites (Isoptera) and ants (Hymenoptera), also aphids (Homoptera), beetles (Coleoptera), butterflies and moths (Lepidoptera), dragonflies (Odonata), grasshoppers (Orthoptera), mantids, mayflies (Ephemeroptera), spiders (Araneae). Small vertebrates include small lizards and geckoes. Also takes beeswax. In study in Kenya, diet 72% fruit, 14% flowers, 14% insects. Nestling diet entirely insects for first week, subsequently augmented with fruit. Forages in pairs, in family parties of 3–4 individuals, or in large groups with other frugivores; may gather into larger, loose flocks of up to 100 birds during non-breeding season. Feeds in trees and shrubs; food occasionally taken from ground. Plucks berries and swallows them whole, sometimes hanging-upside down from twigs, and pecks into larger fruits; takes fallen fruit. Probes flowers, particularly aloes, for nectar. Gleans arthropods from foliage, sometimes while hovering, and darts after insects flushed by its activity; often sallies after flying insects, twisting and turning in pursuit of prey, regularly returning to same perch on top of tree or bush, or moving to new perch. In early morning will glean insects from walls and similar substrates (where insects attracted by lights on previous evening). Breaks open termite galleries to take workers, and attends swarms of *Dorylus* ants. Accepts food at feeders, picnic sites and camping grounds, and forages on buildings for spiders and nocturnal insects. Drinks regularly, being dependent on nearby water during the dry season.
Breeding. Season Mar–Sept (mainly May–Jul) in Morocco, May–Aug in Algeria and Tunisia, and Mar–Aug in Egypt; probably all year in W Africa, peaks variable, e.g. Feb–Apr in N Mauritania and Jul and Dec in S, mainly Jun–Aug in Senegambia, Aug–Feb in Liberia, mainly Jul–Dec in Ghana but mainly during Apr–Jul rains in Nigeria; mainly Jan–Oct in NE, but to Dec in E Ethiopia (*dodsoni*); all months in C & E Africa, peak Sept–Nov in Angola; Jul–Apr (peak Sept–Nov) in Zambia, Sept–Feb (peak Oct–Nov) in Malawi, and Aug–Mar (mainly Sept–Dec/Jan) in Zimbabwe and Botswana; Sept–Apr in South Africa; at least some females double-brooded. Monogamous. Solitary nester, territorial only during breeding season, male sings almost continuously from prominent perches for 30–40 minutes at dawn, irregularly and for shorter bouts through rest of day. Courting male gives characteristic wing-flutter display accompanied by whining calls. Nest built by female, taking 8–10 days, a neat and strong, but often thin-walled cup of dry grass, rootlets and small twigs, lined with finer plant fibres, animal hair, and sometimes human fabrics, external diameter 7·5–12 cm and depth 5–6 cm, internal diameter 6–7 cm and depth 4–5 cm; placed on branch or twigs, or slung between twigs in fork, and attached to support with spider webs, usually 1–5 m (occasionally up to 13 m) above ground and generally far from trunk of supporting tree; often nests close to human activity, usually screened by vegetation but occasionally in open. Clutch 2–5 eggs, laying interval 1 day (rarely 2 days); incubation by female, starting when clutch complete, fed on nest by male, incubation period 12–15 days; chicks fed by both parents, often visiting together, nestling period 10–17 days, mostly 13–16 days; young can barely fly when they leave nest, remain bunched together in nearby foliage for first few days before starting to follow adults, start to feed themselves at 28–33 days, but usually fed until 40 days and may continue to beg until 50 days. Of 13 eggs in Morocco, ten hatched and five young fledged, and in Gabon mean of 0·82 young fledged from 64 nests (42% of nests lost, all to driver ants); nesting success 22% in South Africa (111 nests) and 40% in Zimbabwe (98 nests), and average of 2·3 young fledge per successful nest in S Africa. Brood parasitism by Jacobin Cuckoo (*Clamator jacobinus*) frequent, with occasional parasitism by African Emerald, Klaas's and Diederik Cuckoos (*Chrysococcyx cupreus*, *C. klaas* and *C. caprius*) and Red-chested Cuckoo (*Cuculus solitarius*); other causes of loss include young falling from small nests, nests washed away by heavy rain, and predation by shrikes (Laniidae), mongooses (Herpestinae) and cats.
Movements. Resident across much of range. In N Africa may wander locally, mostly within breeding range, particularly in winter, and in Senegambia leaves most arid parts in dry season. Also, influxes with the rains reported in parts of the Sahel in Chad.
Status and Conservation. Not globally threatened. Common to abundant across its huge range; one of commonest birds in Africa. Population in Liberia estimated to be at least 1·5 million pairs, and in S Mozambique 5–10 million birds. Estimated densities in Morocco 1·6 pairs/km² in undisturbed woodland, 14·8 pairs/km² in degraded woodland, and 21–24 pairs/km² in semi-arid scrub in lowlands and high valleys; in Swaziland 69 birds/100 ha in acacia (*Acacia*) savanna, 79 birds/100 ha in broadleaf woodland and 345 birds/100 ha in riverine forest; breeding densities of 10 pairs/100 ha in mixed *Brachystegia* woodland in Zimbabwe and up to 14 pairs/100 ha in suburban

On following pages: 23. African Red-eyed Bulbul (*Pycnonotus nigricans*); 24. Cape Bulbul (*Pycnonotus capensis*); 25. White-eyed Bulbul (*Pycnonotus xanthopygos*); 26. White-eared Bulbul (*Pycnonotus leucotis*); 27. Himalayan Bulbul (*Pycnonotus leucogenys*); 28. Red-vented Bulbul (*Pycnonotus cafer*); 29. Sooty-headed Bulbul (*Pycnonotus aurigaster*); 30. Puff-backed Bulbul (*Pycnonotus eutilotus*); 31. Blue-wattled Bulbul (*Pycnonotus nieuwenhuisii*).

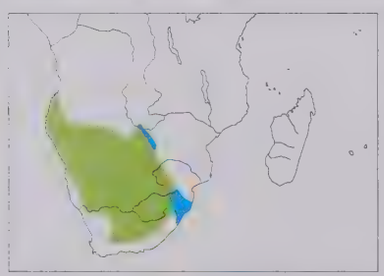
gardens in South Africa (Eastern Cape). Has thrived in certain anthropogenic habitats; has, for example, benefited from forest fragmentation and the afforestation of grasslands, particularly around human settlements. Range in Egypt expanded considerably during 20th century. Well represented in a large number of protected areas across its range. Sometimes killed as a pest in fruit orchards.
Bibliography. Archer & Godman (1937–1961), Ash & Miskell (1983, 1998), Bannerman (1936, 1953), Barlow *et al.* (1997), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1972, 1980), Brooke (1973), Brosset (1971a), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Clancey (1964, 1996), Colston & Curry-Lindahl (1986), Cramp (1988), Dean (2000), Demey & Fishpool (1994), Dowsett (1993), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1989, 1996), Dowsett-Lemaire & Dowsett (2004), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Gatter (1997), Ginn *et al.* (1989), Goodman *et al.* (1989), Gore (1990), Grimes (1987), Hall & Moreau (1970), Hanmer (1978, 1984), Hanmer & Manson (1988), Harrison *et al.* (1997), Heyman & Morlion (1980), Horne & Short (1990), Irwin (1981), Isenmann & Moali (2000), Jackson & Sclater (1938), Julliard (1986), Keith *et al.* (1992), Lawson (1962), Lewis & Pomeroy (1989), Lippens & Wille (1976), Lloyd (2005c), Lloyd & Palmer (1998), Lloyd, Craig *et al.* (1997), Lloyd, Hulley & Craig (1994, 1996, 1999), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993), Mann (1985), Mlingwa (1993), Mlingwa & Bairlein (1998), Monadjem (2001b, 2002b, 2003), Morel & Morel (1990), Nikolaus (1987, 1989), Pakenham (1979), Parker (1999), Penry (1994), Prigogine (1971, 1978, 1984), Rand (1958), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Sinclair & Hockey (1996), Skinner (1995), van Someren (1956), Stevenson & Fanshawe (2002), Tarboton (2001), Thévenot (1982), Thévenot *et al.* (2003), Thiollay (1985), Urban & Brown (1971), Vernon (1975), Vincent (1947), White (1956), Zimmerman (1972), Zimmerman *et al.* (1996).

23. African Red-eyed Bulbul

Pycnonotus nigricans

French: Bulbul brunoir **German**: Maskenbülbül **Spanish**: Bulbul Encapuchado
Other common names: Black-fronted/Red-eyed Bulbul

Taxonomy. *Turdus nigricans* Vieillot, 1818, banks of the Orange River in Namaqualand, Namibia–South Africa border.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. barbatus*, *P. capensis*, *P. xanthopygos*, *P. leucotis* and *P. leucogenys*, possibly including some other species. Parapatric and locally sympatric with both *P. barbatus* and *P. capensis*, and hybridizes extensively with both in narrow transition zones along at least part of boundaries between their respective distributions. Nominate race intergrades with *superior* over a broad front along middle R Orange and in Griqualand West (South Africa). Proposed race *grisescentior* indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
P. n. nigricans (Vieillot, 1818) – SW Angola, Namibia and Botswana S to N South Africa (S to Northern Cape and middle R Orange); non-breeding extreme SW Zambia and NW Zimbabwe.
P. n. superior Clancey, 1959 – South Africa (North-west Province S to Eastern Cape) and Lesotho.



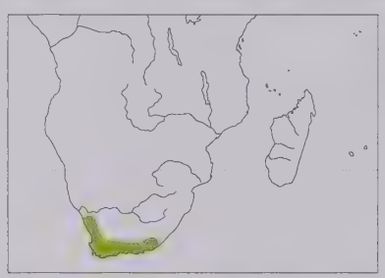
Descriptive notes. 19–21 cm; 21·5–37·5 g. A medium-sized bulbul with slightly peaked crown, giving distinctive, squarish head shape. Has head and neck black, ring of bare orange or orange-red skin around eye; upperparts, including wings, grey-brown, some feathers with paler margins; tail blackish-brown, very narrow pale tips (which disappear through abrasion); chin and throat blackish-brown, side of neck and breast brown, feathers with pale fringes producing scaly appearance, lower breast whitish with some narrow brown streaking, flanks pale brown, belly white, vent and undertail-coverts bright yellow; iris bright red to orange; bill black; legs black. Differs from very similar *P. barbatus* and *P. capensis* in conspicuous orange-red eyering. Sexes alike, female on average slightly smaller than male. Juvenile is like adult, but duller and paler above, eyering pink, eye brown; newly fledged young have no coloured eyering, by 2 months acquire yellowish-white ring, which gradually changes to pink by 3 months. Race *superior* in on average larger than nominate, slightly darker above, and blackish-brown of throat extends farther on to breast, which is more extensively brown. Voice. Loud song of repeated phrases, each of up to c. 7 notes, given generally only by male in the wild (both sexes apparently sing in captivity); very like that of *P. barbatus*, but delivered more slowly and with notes tending to be a little richer and deeper. Contact call a fast jumble of c. 3–5 notes, also various chattering and nasal calls; loud chattering call of 2–3 seconds by male during wing-flicking display, in conflict situations or as greeting to mate; all calls extremely similar to those of *P. barbatus*.
Habitat. Dry woodland, acacia (*Acacia*) savanna, semi-arid shrubland, riverine bush, and shrubby watercourses in otherwise open and treeless areas; also orchards and gardens. Replaces *P. barbatus* and *P. capensis* in wide range of habitats in arid and semi-arid regions, wherever water and sufficient trees or shrubs present. Distribution corresponds with lower winter temperatures and higher coefficient of variation in annual rainfall of arid interior. Lowlands from sea-level, to 2000 m in W Lesotho.
Food and Feeding. Large range of wild and cultivated fruits; also arthropods and nectar. Fruits taken include, among others, figs (*Ficus*), *Lantana*, *Popowia*, mulberry, grapes. Arthropods mostly insects, such as beetles (Coleoptera), ants (Hymenoptera) and aphids (Homoptera). In captivity, average daily consumption (dry weight) c. 22% of the bird's own weight. Usually found in pairs or small, loose groups; larger foraging flocks during non-breeding season, when regularly joins mixed-species parties. Noisy and conspicuous, with continuous, excited calling from large groups gathered at fruiting trees. Forages, sometimes acrobatically, in trees and shrubs; occasionally on ground. Flies up to hawk insects above vegetation, and darts after insects flushed from foliage. Visits feeders and birdbaths in gardens, where it becomes tame and familiar. Drinks regularly.
Breeding. Recorded mainly in Oct–Dec in Botswana, Nov–Jan in South Africa and Dec–Feb in Namibia, and is stimulated by first rains of spring. Monogamous. Solitary nester, adjacent pairs at least 50–100 m apart; territorial during breeding season, male sings during dawn chorus from several prominent perches. Courting male gives characteristic wing-flutter display accompanied by whining call. In wild, nest built by only one partner, presumably female, whereas both sexes of a captive pair recorded as building; nest is a cup of dry grass, fine twigs, rootlets and other fibres, lined with finer grass fibres, external diameter 9–12 cm, depth 7 cm, inner diameter 6–6·5 cm, depth 4·5–5 cm; placed in fork in bush or tree, often well hidden, at height of 1–4 m. Clutch 2–3 eggs, rarely 4, laid at 1-day intervals; incubation by female only, period 11·5 days; for one pair in captivity, incubation by both sexes, period 12 days; chicks fed by both parents, nestling period 12–13 days; fledglings able to feed themselves at 26 days, but still accept food from parents. Average of 2·2 young fledge per successful nest. Brood parasitism by Jacobin Cuckoo (*Clamator jacobinus*) regular.
Movements. Wanders during dry non-breeding season. In addition, parts of some populations undertake often wide-ranging movements E of normal range in dry season or during drought years. Seasonal influxes of large numbers into the Okavango Delta (N Botswana) and as far N as R Zambezi and SW Zambia commonly occur. Nearly all records in NW Zimbabwe are during dry season, indicating seasonal movement from Botswana; Zambian records from early Jun to late Oct. During droughts, moves down Limpopo Valley and into NE Gauteng and C Northern Province, in South Africa; regular but temporary influxes into Kalahari Gemsbok National Park and parts of the arid C Karoo in Northern Cape correspond with high rainfall events or with fruiting seasons of trees and shrubs. One unusual record of a pair on Cape Peninsula, 250 km from SW limit of species' normal range.
Status and Conservation. Not globally threatened. Common and widely distributed. Thrives in gardens and orchards, and has benefited from the provisioning of water for stock animals in arid areas. Well represented in protected areas.
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24. Cape Bulbul

Pycnonotus capensis

French: Bulbul du Cap **German**: Kapbülbül **Spanish**: Bulbul de El Cabo

Taxonomy. *Turdus capensis* Linnaeus, 1766, Cape of Good Hope, South Africa.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. barbatus*, *P. nigricans*, *P. xanthopygos*, *P. leucotis* and *P. leucogenys*, possibly including some other species. Parapatric and locally sympatric with *P. nigricans* and, in small area of Eastern Cape Province, with *P. barbatus*; hybridizes extensively with both in narrow transition zones along at least part of boundaries between their respective distributions. Monotypic.
Distribution. SW & S South Africa, in provinces of Northern Cape, Western Cape and Eastern Cape (from just S of R Orange, S along coast, inland to edge of Karoo, and E to R Sundays).



Descriptive notes. 19–21 cm; 28–47·5 g. A medium-large bulbul with slightly peaked crown, giving distinctive, squarish head shape. Head is dark brown, blacker at side, with conspicuous ring of bare white skin around eye; upperparts, including wings and tail, wholly blackish-brown; throat and breast also blackish-brown, upper belly and flanks paler brown, lower belly whitish, vent and undertail-coverts lemon-yellow; iris red-brown; bill black; legs black. Differs from similar *P. nigricans* in having conspicuous white (rather than orange-red) eyering. Sexes alike in plumage, female on average slightly smaller than male. Juvenile resembles adult, but white eyering does not develop before 2–3 months. Voice. Song a series of short phrases, "chip-chee-woodely", "chup-wheet-churry-up" and "pit-peet-pitmajol", similar to that of *P. barbatus* but higher-pitched and more slurred. Contact call "key-link", or rapid, metallic "chit-tee" or "chit-tee-tee" when more anxious; alarm a low "churr" or "churrt"; excited, rapidly repeated "chop-doodle-it" chatter during wing-flicking display.
Habitat. Range of generally shrubby habitats, including tall, shrubby fynbos, coastal scrub, dune forest, riverine bush and gardens; particularly fond of the exotic *Acacia cyclops*. Occurs in *Acacia karroo* woodland along drainage lines at edge of the Karoo, and in dry valley bushveld in Eastern Cape. Generally prefers moist conditions; distribution corresponds with regions of winter or year-round rainfall. Mainly below 500 m.
Food and Feeding. Wide variety of fruits, seeds, nectar and arthropods. In one study, c. 90% of diet comprised vegetable matter, mainly fruits of 23 plant species (principally, in decreasing importance, *Rhus crenata*, *Acacia cyclops*, *Chrysanthemoides monilifera*, *Rapanea gilliana*, *Mundia spinosa*), and 10% arthropods; average dry-weight daily consumption c. 24% of the bird's own weight. Nestling diet mostly arthropods for first six days, thereafter mainly fruit; of items fed to nestlings, 58% were arthropods, 42% fruit. Occurs singly or, more usually, in pairs; outside breeding season, congregates in small foraging flocks, typically of 5–9 individuals, but up to 40 may gather with other frugivores at fruiting trees or to feed on nectar at mass-flowering *Salvia* shrubs. Noisy and conspicuous, often perching on top of bushes. Forages in foliage of trees and shrubs; hawks insects on the wing, and also takes them from flowers. Drinks water regularly, particularly during hot, dry summer months; flocks congregate at water sources.
Breeding. Recorded in Aug–Mar, peak Sept–Oct, in Western Cape (winter rainfall region), and in Sept–Mar, peak Oct–Nov, in Eastern Cape; at least some females double-brooded. Monogamous; usually (not always) pairs for life, and partners remain together throughout year. Solitary, territorial nester, territory 1–2 ha, male sings during dawn chorus from one or more prominent perches, during day song most frequent and sustained (10–23 minutes) during nest-building and early incubation. Courting male gives wing-flutter display with whining call. Nest built by female, rarely assisted by male (but male follows her closely, often singing from nearby bushes), constructed in 2–10 days, mostly during 07:00–11:00 hours, a sturdy, untidy cup of twigs (some with leaves), rootlets and grass stems built on foundation of coarse twigs, lined with finer plant fibres and sometimes sheep's wool, cobwebs, feathers, paper, string and other human rubbish, external diameter 11 cm, depth 6·5 cm, internal diameter 6·5 cm, depth 4·5 cm; located just within outer canopy of leaves of tree or shrub (frequently *Acacia cyclops*), on more or less horizontal outer branch 5–20 mm in diameter, at height of 0·3–4 m; new nest built for second brood, sometimes incorporating material from first nest, one female started second nest 10 days after first brood left, and another was incubating second clutch while male continued to feed first brood 17 days after they had left nest. Clutch 2–5 eggs, mostly 3, first egg laid within 1–4 days of nest completion, subsequent ones usually at 1-day intervals; incubation by female only, not fed by male, period 11·5–13·5 days from clutch completion; chicks fed by both parents, male slightly more, but female does most of brooding, nestling period 10–13 days; chicks usually leave nest before able to fly, capable of controlled

flight at 15 days, fed for at least 2 weeks after leaving nest, at least occasionally for further 2 weeks, appear independent at c. 50 days. Of 233 eggs laid, 63 (27%) produced fledged young; average of 2·1 chicks fledge per successful nest. Nests heavily parasitized by Jacobin Cuckoo (*Clamator jacobinus*), e.g. 12–73% (average 39%) in one area over 4-year study, but many parasitized nests preyed on and losses to cuckoos only 7%; predation rate 60–83%, with mammals, particularly rodents but also vervet monkey (*Cercopithecus aethiopicus*), mongooses (Herpestinae) and felids, responsible for 70%, birds, mainly White-browed Coucal (*Centropus superciliosus*) and Southern Boubou (*Laniarius ferrugineus*), for 16%, and snakes (mainly *Dasypeltis scabra*) for the remainder. Survival rate of fledglings estimated at 18% after 1 month, 10% after 1 year; annual adult mortality rate 25%, mean life expectancy of adult 3·1 years.

Movements. Mainly sedentary; seasonal influxes occur in response to fruiting shrubs. Although some individuals appear to remain on territories throughout year, others vacate them during non-breeding season and join foraging flocks that range more widely.

Status and Conservation. Not globally threatened. Locally common to abundant. Mean breeding density in an area of coastal scrub over 5 years 13·8 pairs/20 ha, range 9–19 pairs/20 ha. Has adapted well to transformed habitats. Reasonably well represented in protected areas, including Tsitsikamma National Park, Anysberg, De Hoop and Marloth Nature Reserves, and Cedarberg Wilderness Area.

Bibliography. Dean & Milton (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Ginn *et al.* (1989), Gray (1998), Hall & Moreau (1970), Harrison *et al.* (1997), Harwood (1973), Keith *et al.* (1992), Lawson (1962), Liversidge (1970), Lloyd (2005b), Lloyd & Palmer (1998), Lloyd, Craig *et al.* (1997), Lloyd, Hulley & Craig (1996), Mackworth-Praed & Grant (1963), Maclean (1993), Sinclair & Hockey (1996), Tarboton (2001), Trendler (1996), Vincent (1947).

25. White-eyed Bulbul

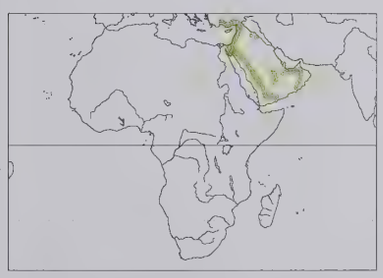
Pycnonotus xanthopygos

French: Bulbul d'Arabie **German**: Gelbsteißbülbül **Spanish**: Bulbul Árabe
Other common names: Yellow-vented Bulbul(!), Black-capped Bulbul, White-spectacled Bulbul

Taxonomy. *Ixus xanthopygos* Ehrenberg, 1833, Arabia = Al Muwaylih, on coast near north end of Red Sea, Saudi Arabia.

Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. barbatus*, *P. nigricans*, *P. capensis*, *P. leucotis* and *P. leucogenys*, possibly including some other species. No hybrids with *P. barbatus* known, and ranges apparently barely meet, but an old record of a mixed pair reported. Monotypic.

Distribution. E Mediterranean from CS Turkey, W Syria, Lebanon, Israel and W Jordan S to NE Egypt (Sinai), also W & C Iraq, W & S Saudi Arabia, Yemen, N United Arab Emirates and N & SW Oman.



Descriptive notes. c. 19 cm; 31–46 g. A medium-sized species with whitish to pale grey eyering and yellow vent; the only bulbul in its range. Head is black, browner on hindcrown, contrasting bare eyering white, bluish-white, greyish-white or pale flesh-grey; upperparts grey-brown, in fresh plumage washed olive-yellow, particularly on rump and uppertail-coverts; wings dark grey-brown, slightly darker than upperparts, narrow pale grey-brown fringes on outer webs of flight-feathers and greater upper primary coverts; tail black, central pair of feathers tinged grey-brown; upper chin black, lower chin, rear of ear-coverts and lower cheeks blackish-brown, throat dark brown; breast, flanks and belly pale grey-brown, slightly paler than upperparts, vent and undertail-coverts bright yellow; in worn plumage, face becomes duller, browner, upperparts paler and browner, wings and tail duller and darker (but abraded feather tips bleached paler grey-brown), underparts paler, lower belly grey-white and undertail-coverts paler yellow; iris black, dark brown or brown; bill black or dark bluish-black, paler at base; legs black or slaty blue. Sexes alike, female on average slightly smaller than male. Juvenile has face duller grey-brown, upperparts somewhat paler, feathering softer and looser, particularly on rump and undertail-coverts. Voice. Song, from elevated but not necessarily exposed perch, a monotonous repetition of a single phrase of 2–9 syllables, variously stressed, may be rich and fluty, sometimes a contralto whistle, sometimes deeper and more husky, but usually given in short, disjointed snatches, variously rendered as "bli-bli-bli-bli", "bul-bul-bul-bul", "twur-tu-twéé-teeroo" and similar, or even (in Oman) "tchink-tchink-tchink, kutchi-kutchi-kutchi, tiwink-tiwink-tiwink"; seems to vary regionally, and possible that this variation similar to that of *P. barbatus*, neighbouring territorial males of which have similar repertoires but more distant birds have no phrases in common. Occasionally mimics other birds, e.g. Thrush Nightingale (*Luscinia luscinia*), Common Blackbird (*Turdus merula*) and Golden Oriole (*Oriolus oriolus*). Calls include thin, faint chirping and whistling sounds in greeting after short period of separation, louder, sharper calls rendered "MINE, you're MINE, you're MINE" after more extended separation and also in confrontations, and bubbling courtship call; alarm or threat call a sharp, burry, scolding "weck", "trratsh" or "pwitch", often repeated with gathering intensity to become penetrating, high-pitched chatter and used to threaten conspecifics and when mobbing.

Habitat. Wide range of well-vegetated areas with low trees and bushes, in both natural vegetation and cultivation, including open pine (*Pinus*) woods, juniper (*Juniperus*) forest, *Ceratonia* scrub, thick bush in wadi beds, trees and bushes in open semi-desert, oases, orchards, groves, fields, gardens and villages. Sea-level to at least 1000 m in Turkey, to 1300 m in Israel, to 2000 m in Egypt and even higher in Saudi Arabia.

Food and Feeding. Mostly fruit, also seeds and invertebrates; less frequently, nectar, leaves and flowers. Eats wide variety of wild and cultivated fruit, including *Azadirachta*, *Nitraria*, *Opuntia*, dates, mulberries, peaches, plums, tomatoes, strawberries; small fruits swallowed whole, larger ones nibbled. Takes leaves and petals of *Erythrina* and *Iris*. Invertebrates eaten include flies (Diptera), moths (Lepidoptera), hymenopterans (alate ants, bees, wasps), orthopterans, spiders (Araneae), earthworms, gastropod snails. Also reported as eating carrion. Nestling diet initially only insects and spiders, later increasing proportion of fruit. Insects often taken in aerial sallies from tree perch, particularly at dusk; also gleans from leaves, sometimes hover-gleans, and descends to ground level to forage among fallen vegetation. Recorded as chasing Hoopoes (*Upupa epops*) to steal mole-crickets (*Gryllotalpa*). Inquisitive, noisy, cheerful; tame around settlements, more cautious elsewhere. Gregarious all year. Usually occurs in pairs, or in "duos" comprising two siblings of same or different sex which associate closely. Often gathers in greater numbers at locally abundant food sources; flocks of 25–40 recorded in Jordan and of several hundreds, even thousands, in Israel, particularly at end of breeding season, when up to 83% of such flocks comprise first-year birds. Pairs or duos territorial all year, but territory less aggressively defended in non-breeding season, will leave temporarily to join noisy feeding flocks; movements of a few kilometres between feeding stations may occur daily. Feeding activity of flocks often begins before sunrise and usually ends in late afternoon, up to half an hour before sunset.

Breeding. End Mar to end Aug in Israel, from late Apr in Oman, from Feb in Saudi Arabia (newly fledged young Jul), Mar in Gulf states, fledgling in Mar in Egypt; mostly two broods, sometimes three, in Israel, suspected as triple-brooded in Saudi Arabia. Monogamous; pair-bond maintained all year and for several years. Territorial, solitary nester; territory vigorously defended by both sexes by vocalization and aggressive displays, including pumping of spread tail, sometimes with wings lowered and head plumage ruffled, by loud-calling male, also upright threat display with neck stretched, bill pointed upwards and plumage sleeked, and direct attack. Nest built by female, taking 4–7 days, a cup or small basket of thin twigs, grass stems, moss and leaves, base constructed of broad leaves (sometimes with newspaper, strips of plastic or cotton wool), structure held together by cobwebs and cotton threads, lined after a fashion with hair, shredded bark and rootlets, apparently sometimes unlined, external diameter 8–10 cm, internal diameter 6·5 cm, cup depth 4–5 cm; placed among thin branches 1–2·5 m above ground in low palm or bush; in Israel, territory size a few hundred square metres (average minimum inter-nest distance 200 m) and territories usually contiguous in favourable habitat, much smaller (0·05–0·19 ha) in urban situations than in desert areas. Clutch 2–4 eggs, usually 3; many replacement clutches laid, as losses frequent; incubation by female, period 13–14 days; chicks fed initially by female, then by both parents, brooded at night for first week by female, leave nest after 13–15 days, fly c. 10 days later; young able to feed themselves after 4 weeks, independent at 6 weeks; after leaving parental territory, brood-members remain in duos or often trios, in latter case one gradually severing links and joining another, unrelated individual, and duo-members forming bond with non-sibling of opposite sex after 4–6 months. Success low, only 15–35% of eggs laid reach chick stage; in natural habitats many nests destroyed by fire or preyed on by snakes and small mammals, while in orchards and woods many lost to Eurasian Jays (*Garrulus glandarius*). Age of first breeding sometimes 1 year, often 2 or more.

Movements. Mostly resident; some local wandering in search of fruit sources. Altitudinal migration recorded in Israel, and may occur in Turkey. Some young disperse over short distances.

Status and Conservation. Not globally threatened. Fairly common to abundant throughout its range. Israel population estimated at a few hundred thousand pairs in 1980s; estimated 5,000–10,000 pairs in United Arab Emirates. Has benefited from a number of anthropogenic habitats. Considerable expansion of range in some areas since c. 1930s, attributable at least in part to development of settlements and spread of cultivation of fruit crops into desert areas; recent records from Iraq may be a continuing manifestation of this process. Often causes extensive damage in orchards etc. Regarded as an agricultural pest in some places; may be killed legally in Israel, where 670 were trapped within area of 0·5 ha in a 9-day period in Jun 1984.

Bibliography. Andrews (1995), Arnold & Ferguson (1962), Aspinall (1996), Baumgart *et al.* (1995), Benson (1970), Cramp (1988), Eriksen & Sargeant (2003), Gallagher & Woodcock (1980), Goodman *et al.* (1989), Green & Ward (2000), Hasson (1978), Hüe & Étchécopar (1970), Inbar (1977), Izhaki (1992), Jennings (1981a, 1981b), Keith *et al.* (1992), Kirwan *et al.* (2006), Kumerloeve (1957), Newton & Newton (1993, 1996), Paz (1987), Phillips (1982), Porter *et al.* (1996), Rasmussen (1992), Richardson (1990), Roselaar (1995), Shirihai (1996), Silsby (1980), Tsahar *et al.* (2003), Wallace (1984).

26. White-eared Bulbul

Pycnonotus leucotis

French: Bulbul à oreillons blancs **German**: Weißohrbülbül **Spanish**: Bulbul Orejiblanco
Other common names: White-cheeked Bulbul(!)

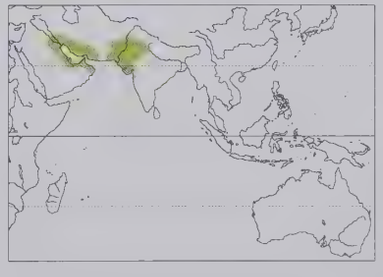
Taxonomy. *Ixos leucotis* Gould, 1836, Karachi, Sind, Pakistan.

Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. barbatus*, *P. nigricans*, *P. capensis*, *P. xanthopygos* and *P. leucogenys*, possibly including some other species. Hybridizes with last-mentioned in E Afghanistan and N Pakistan (putative race *humii* represents a hybrid swarm) and often treated as conspecific, but differs morphologically, and hybridization zone is relatively abrupt. Elsewhere, sometimes hybridizes with *P. cafer*, including in Oman (where latter introduced). Old record of mixed pair of present species and *P. barbatus*, but no hybrids known (and ranges apparently do not meet). Race *mesopotamia* (erroneously emended to to "*mesopotamiae*") only marginally differentiated and its validity requires review. Proposed races *farahensis* (Afghanistan) and *dactylus* (Saudi Arabia) not reliably distinguishable. Two subspecies recognized.

Subspecies and Distribution.

P. l. mesopotamia Ticehurst, 1918 – E & SE Iraq, S Iran and Kuwait; also E Saudi Arabia (and probably introduced inland, at Riyadh) S to United Arab Emirates, Qatar and Oman (probably introduced).

P. l. leucotis (Gould, 1836) – SE Afghanistan, Pakistan (except far N) and NW India (E to W Uttar Pradesh and N Madhya Pradesh, also NW Maharashtra).



Descriptive notes. 17·5–19 cm; 18–28 g (nominate), 29–35 g (*mesopotamia*). Medium-sized, lively, conspicuous bulbul, virtually uncrested. Has black head and throat, with large white patch on side of head; upperparts relatively pale grey, becoming even paler on rump; breast also relatively pale, hardly darker than lower underparts; vent and undertail-coverts bright orange-yellow; iris dark brown or hazel, pale bare eyering dull greyish to dull yellowish; bill blackish-horn; legs bluish-grey to slaty black. Differs from rather similar *P. leucogenys* in slightly smaller size, lack of crest, thicker and shorter bill, and colour of vent. Sexes similar. Juvenile has brown replacing black on head, and paler body, wings and tail, paler yellow undertail-coverts. Race *mesopotamia* is on average slightly larger than nominate, with longer wing and tail, larger and stouter bill, yellow eyering. Voice. Song a brief, rapid complex chatter, sometimes preceded by a few dry chirps; generally quicker, harder and less squawky than song of *P. leucogenys*, and much clearer and less guttural, includes more notes than song of *P. cafer* and does not descend strongly. Sometimes contains segments of mimicry. Calls a short, slightly harsh and nasal "nyuk, nyuk", or mellow "pip" and "pip-pip".

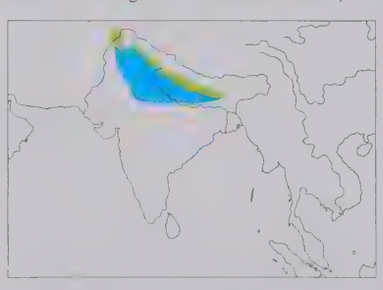
Habitat. Dry woodland, thorn-scrub, semi-desert scrub (with *Capparis*, *Salvadora* and *Carissa* bushes), riverine shrubbery, mangroves, palm groves (sometimes small and isolated), gardens, agricultural land and orchards. Sometimes frequents tall reedbeds, especially when roosting. Often breeds in *Euphorbia* woodland. In Pakistan the dominant bird in *Olea cuspidata* and *Dodonaea viscosa* scrub. Lowlands, rarely to 2100 m; usually replaced at higher altitudes by *P. leucogenys* in Pakistan and India, and by *P. xanthopygos* in Oman.
Food and Feeding. Feeds on fruit (including *Capparis*, *Ziziphus*, *Salvadora*) and buds, also nectar (e.g. *Capparis*); also large amounts of invertebrate food, including caterpillars and alate ants (Hymenoptera) and termites (Isoptera). Usually encountered in pairs or small groups, sometimes in flocks of 20–30 individuals. Often descends to the ground in quick sallies, or hops around for more extended periods, to feed on insects, seeds and other items; probes flowers to feed on nectar, or on the insects gathered there. Flying ants and termites often caught in short, clumsy aerial sallies.
Breeding. Feb–Sept; usually Apr–Jul in Iraq and Jul–Sept in India (Punjab and Gujarat). Trios of adults regularly seen during breeding season, suggesting that some possible communal breeding with helpers, but verification needed. Display includes spreading and fluttering of wings and tail by male, and fanning of bright vent plumage. Nest a simple but firmly built cup-shaped structure, composed of fine twigs, rootlets, grass and other plant fibres, sometimes unlined, usually neatly lined with slender fibres; both partners visit nest-site together during building phase, but only one (presumably female) brings material, suggesting that male mate-guards female during fertile period; nest usually fairly low, 0·8–3·2 m above ground (average 1·36 m for 20 nests in Iraq), and in huge variety of situations, most often in almost any type of shrub or small tree available, including bramble (*Rubus*), *Tamarix*, *Capparis*, *Ziziphus*, *Dodonaea*, *Acacia nilotica*, *Prosopis*, *Lagerstroemia*, citrus tree, date palm (Arecaceae), pomegranate (Punicaceae), mulberry bush (Moraceae), poplar (Salicaceae), *Eucalyptus*, often in candelabra-like stems of *Euphorbia caducifolia*; in Iraq sometimes in tall "sarkanda" (*Saccharum spontaneum*) grass and, perhaps regularly, in reedbeds alongside R Euphrates; more unusually, in tall broad-bean crop, on limestone rock ledge, on verandah, under eaves, in *Bougainvillea* growing against house, in wall of reed hut, in reed frame supporting melon plants, and inside building. Clutch 2–4 eggs, usually 3, extremely rarely 5; incubation by female, period 13–14 days in Pakistan, 10·5–12·5 days in Iraq; chicks fed by both sexes, nestling period 9–11 days in Iraq. Of 19 nests in Iraq, only three (16%) produced young; predation by crows (Corvidae) probably high, as many nests poorly concealed.
Movements. Largely resident, but subject to local movements; poorly understood seasonal migrations. In lower-lying regions of N & C Pakistan large numbers of non-breeding visitors augment resident population in winter, or arrive where no breeding population present. Summer visitor in Chitral (Hindu Kush), in NW Pakistan, arriving Mar and leaving Oct. Around NE shores of Persian Gulf, arrives in numbers in Sept, and leaves again in Jun. In Iraq and Iran, occurs in small, very isolated date palm groves in open desert, suggesting that it disperses well across inhospitable country. Records from Israel and Jordan possibly refer to escaped captives.
Status and Conservation. Not globally threatened. Locally common and conspicuous in many regions, including N India, much of Pakistan (e.g. Baluchistan), S Iraq and lower reaches of R Euphrates. Previously common (the "very commonest bird") in Sind (Pakistan), but now quite scarce and replaced in urban and irrigated areas by *P. cafer*. This species is commensal with man and faces no threats, apart from irrigation of a few desert regions.
Bibliography. Abdulali (1934), Adam (1873), Ali (1945), Ali & Ripley (1996), Barnes (1889), Betham (1916), Bralsford (2004), Brooking (1919), Capito (1931), Chinnery (1901), Cramp (1988), Cumming, J.W.N. (1905), Cumming, W.D. (1902), Currie (1916), Darreh-Shoori *et al.* (2001), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Eriksen & Sargeant (2003), Fulton (1904), Gallagher & Woodcock (1980), Grimmett *et al.* (1998), Harrison (1982), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Hume (1872–1873), Huntington (2002), Koelz (1939), Makatsch (1958), Marchant (1963), Marshall (1902), Meriwani (1973), Mukherjee (1995), Oates (1889), Paludan (1959), Porter *et al.* (1996), Rasmussen & Anderton (2005), Rattray (1899), Reinkemeier (2003), Roberts (1992), Shirihai (1996), Ticehurst (1918, 1921, 1926–1927), Ticehurst *et al.* (1926), Tomlinson (1916), Waite (1917), Whistler (1922a), Whitehead (1910–1911).

27. Himalayan Bulbul

Pycnonotus leucogenys

French: Bulbul à joues blanches **German**: Himalajabülbül **Spanish**: Bulbul Cariblanco
Other common names: White-cheeked Bulbul(!)

Taxonomy. *Brachypus leucogenys* J. E. Gray, 1835, Kashmir.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. barbatus*, *P. nigricans*, *P. capensis*, *P. xanthopygos* and *P. leucotis*, possibly including some other species. Hybridizes with last-mentioned in E Afghanistan and N Pakistan (putative race *humii* represents a hybrid swarm) and often treated as conspecific, but differs morphologically, and hybridization zone is relatively abrupt. In addition, form described as *Molpastes magrathi* is a hybrid between present species and race *intermedius* of *P. cafer*. Proposed race *picru* (Afghanistan, Pakistan, Kashmir) poorly differentiated, based on clinal size difference, and considered untenable. Monotypic.
Distribution. Breeds E Afghanistan and Himalayas of N Pakistan E through Nepal to NE India (at least to R Dihang, in NE Arunachal Pradesh).



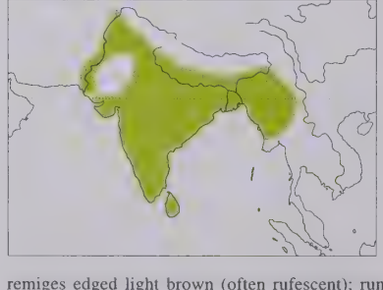
Descriptive notes. 19–20 cm; 34–38 g. Medium-sized, jaunty, conspicuous bulbul with prominent forward-pointing crest. Has prominently white cheeks, black crescent at base of white ear-coverts; upperparts brownish-grey; throat and upper breast blackish, rest of underparts pale greyish, vent and undertail-coverts yellow; iris dark brown or hazel, black eyering; bill blackish; legs pinkish-grey to slaty black. Differs from *P. leucotis* in prominent crest, head pattern, yellow (rather than orange-yellow) vent, slimmer and longer bill. Sexes similar. Juvenile has paler brown plumage overall, including crown and throat. Voice. Song a short, loud, burbling phrase with some notes raspy, others clear, e.g. "chik, chek, churr-Wick", or just "churr-Wick"; also a similar but more complex tumbling song with more notes, and a more halting, free-form version; compared with *P. cafer*, notes are thinner, crisper and more random (less syncopated, more complex). Calls include song fragments interspersed among songs; also said to give loud, short, buzzy, upslurred "bzzrrp", often quickly repeated, and "plee-plee-plee" flight call; larger winter flocks produce cacophony of jumbled call notes.
Habitat. Breeds in wooded valleys, also bushy hillsides, often covered with wild raspberry (*Rubus*) and *Berberis*, and hedgerows, groves, parks, gardens and even town centres. This or a hybrid form occurs locally in *Pinus gerardiana* forest in Pakistan. Currently expanding into deforested areas. Usually at 300–2400m (in W of range), sometimes higher where trees are fruiting; sometimes descends to level lowlands in winter.
Food and Feeding. Diet includes berries and other fruits, e.g. *Carissa opaca* and mistletoes (Loranthaceae), as well as variety of buds and seeds; attacks commercial crops. Hybrids ("*humii*") noted as eating berries of *Ziziphus vulgaris* and "Persian lilac" (*Melia azedarach*) in Pakistan. Also eats many invertebrates, e.g. termites (Isoptera) and ants (Hymenoptera). Usually found in pairs or small parties; occasionally large flocks in non-breeding season. Boisterous, often perching atop bushes and constantly flicking wings and tail. Often very tame, coming to picnic sites and outdoor cafes to steal crumbs and sugar. Often comes to ground to pick up invertebrates, snatching them off branches, or catching them in brief aerial sallies.
Breeding. Apr–Aug, rarely Mar. Nest built mainly or entirely by female, a shallow, sometimes flimsy, cup-shaped structure of fibres, woody plant stems and grass, lined with rootlets and fine grass, usually placed low (0·5–3 m) above ground in tree or bush; often in garden or around building, where regularly tucked into thatched rooftop, or in vines climbing tree or wall. Clutch 3–4 eggs, rarely 5; when clutch lost, replacement laid shortly after; incubation seem to be mainly or entirely by female, but both parents tend nestlings and fledglings; no information on incubation and nestling periods; both sexes observed injury-feigning to lead predators from fledglings. Predation by e.g. crows (Corvidae) probably high, as many nests poorly concealed.
Movements. Resident in many areas (e.g. Kashmir), but prone to seasonal or altitudinal migrations in others. Part of population descends to lower slopes, occasionally to lowland plains, in winter, resulting in sightings far from Himalayas, including L Harike (Punjab). Partially migratory in N Pakistan, where some remain throughout year; numbers increase dramatically in spring, when breeding visitors arrive.
Status and Conservation. Not globally threatened. Generally common to abundant, e.g. in Himachal Pradesh, Kashmir, Nepal etc. Benefits from deforestation and lives commensally with humans; unlikely ever to be at any great risk. Popularly sold in captivity in Pakistan; where trapping a common activity, its range and status should be monitored. In some regions, classed as an agricultural pest for damaging crops such as peas, currants, raspberries.
Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Basil-Edwardes (1921), Bates & Lowther (1952), Betham (1918), Cock & Marshall (1873), Cramp (1988), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Fleming *et al.* (1984), Grimmett *et al.* (1998), Hingston (1921), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Jones (1919), MacKinnon & Phillipps (2000), Magrath (1908, 1909), Mason & Lefroy (1912), Paludan (1959), Perreau (1910), Rasmussen & Anderton (2005), Ripley (1982), Roberts (1992), Robson (1997b, 1999a), Scully (1879), Stevens (1923–1925), Ward (1906–1908), Whistler (1922b, 1930), Whistler & Kinnear (1911), Whitehead (1910–1911).

28. Red-vented Bulbul

Pycnonotus cafer

French: Bulbul à ventre rouge **German**: Rußbülbül **Spanish**: Bulbul Cafre

Taxonomy. [*Turdus*] *cafer* Linnaeus, 1766, Cape of Good Hope; error = Pondicherry, south-east India.
Type locality has twice been corrected, first from South Africa, secondly from Sri Lanka; Sri Lankan race therefore no longer the nominotypical one. Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. aurigaster*; sometimes treated as conspecific owing to interbreeding in Myanmar; hybrids earlier described incorrectly as separate species (*P. nigropileus* and *P. burmanicus*). In NW India, often hybridizes with *P. leucogenys*; hybrids between latter and race *intermedius* of present species incorrectly described as a separate species (*Molpastes magrathi*). Sometimes hybridizes also with *P. leucotis*. Race *saturatus* was invalidated (and replaced by *wetmorei*), as preoccupied by a race of *Andropadus latirostris*, which was previously placed in present genus. Some listed races weakly differentiated or perhaps described from mid-points of clines or hybrid zones; full review needed. Several described races considered too weakly differentiated and therefore synonymized: thus, in India, *primrosei* (Assam) and *afer* (Meghalaya) are junior synonyms of *bengalensis*, and *vicinus* (Mysore) and *pusillus* (NE Tamil Nadu) junior synonyms of nominate. Eight subspecies provisionally recognized.
Subspecies and Distribution.
P. c. intermedius Blyth, 1846 – W Himalayas from Pakistan, Jammu and Kashmir E at least to Nepal.
P. c. humayuni Deignan, 1951 – SE Pakistan (Sind) and NW & NC India (including N plains).
P. c. bengalensis Blyth, 1845 – C & E Himalayas and Gangetic Plain, and Bangladesh.
P. c. stanfordi Deignan, 1949 – NE India (S Assam hills), N Myanmar and S China (W Yunnan).
P. c. melanchimus Deignan, 1949 – S Myanmar and N Thailand.
P. c. saturatus (Whistler & Kinnear, 1932) – NE Peninsular India.
P. c. cafer (Linnaeus, 1766) – S India.
P. c. haemorrhousus (J. F. Gmelin, 1789) – Sri Lanka.
Introduced Polynesia, including Fiji, Samoa and Tonga (*bengalensis*); also E Arabia (Kuwait, Qatar, United Arab Emirates, Oman) and Hawaii (Oahu) (races unknown).



Descriptive notes. 19–20 cm; 28–40 g. Medium-sized, noisy, conspicuous bulbul, generally dark brown and scaly-looking, with bushy crest. Nominate race has black hood, brown upperparts with pale feather margins, prominent white rump, white-tipped black tail; breast brown, feathers pale-fringed, paler below, vent and undertail-coverts bright red; scaly tips of feathers wear off, changing appearance markedly; iris dark brown or hazel; bill black; legs black, soles grey; claws black, occasionally fleshy white. Sexes similar. Juvenile resembles adult, but duller and browner on head and throat, less scaled above, feathers of mantle and remiges edged light brown (often rufescent); rump buffy white, rectrices tipped dull brownish, undertail-coverts pale pink or buff, bill yellowish-horn. Races differ mainly in depth of colour tones, extent of black hood, also in size, generally larger and darker in N, more scaly in S: *humayuni* has paler brown mantle and whiter underparts than nominate; *intermedius* has black hood extending to upper mantle and mid-breast, with heavily grey-scaled upperparts and lower breast, pale lower underparts; *bengalensis* is large, with dark, almost unscaled hood covering mantle and breast (little contrast between crown and mantle), darker ground colour of most feathers (especially no-

ticeable on mantle and breast); *stanfordi* has hood extending to upper mantle and mid-breast, heavy grey scaling above and on lower throat and breast (very like *intermedius*, but slightly darker ground colour, greyer scaling); *melanchimus* is similar to previous, but underparts more extensively dark, upperpart feathers with darker centres and narrower ashy fringing; *saturatus* is intermediate, with sharply defined cap, black ear-coverts, relatively dark mantle, reduced white below; *haemorrhousus* has dark mantle with narrow pale edges. Voice. Produces loud gurgly notes almost constantly. Songs of S races include loud, jaunty, guttural chuckling "kreink-kergrr", inflected downwards, also in rapid squawky descending version, and numerous other variants, both shorter and longer; songs of N races similar but descend less markedly; dialects detectable in different portions of range. Calls include very harsh, guttural, staccato, 2-note "tik-jhurk", second note upturned, or more prolonged "tik-jhuurrh", second note downslurred; also isolated song-type gurgly notes, and explosive "jzzrk" rasps; calls of *melanchimus* include "peep-peep-peep", "peet-wit-wit-wit", and more rapid "pitititi".

Habitat. Drier deciduous woodland, sparse secondary forest, scrub, orchards and gardens, including in large cities, and even extending into sparse stony landscapes with scattered scrub and cactus; usually avoids humid evergreen forest and barren areas away from settlements. Commonly in cinnamon plantations in Sri Lanka. In Myanmar, birds identified as "*burmanicus*" attended huge communal roosts in canebrakes. Occurs from plains, valleys and foothills up to c.1600 m; regularly to 2285 m in Himalayas.

Food and Feeding. An opportunist and generalist; diet includes fruit, nectar, buds and invertebrates, occasionally vertebrates. In Pakistan, said to feed largely on young buds, green leaves and fallen seeds in winter; in Myanmar, recorded as eating grass seeds. Fruits collected from many trees, shrubs and parasitic plants, including *Salvadora*, *Santalum*, *Ziziphus*, *Ficus*, mistletoes (Loranthaceae), wild raspberries (*Rubus*) and *Lantana*; cultivated crops also exploited. In S India (Point Calimere, in Tamil Nadu), noted to feed on fruits from very broad variety of plants (e.g. *Pachygone*, *Tinospora*, *Capparis*, *Flacourtia*, *Hugonia*, *Glycosmis*, *Toddalia*, *Azadirachta*, *Walsura*, *Olax*, *Cansjera*, *Pleurostylia*, *Salacia*, *Scutia*, *Ziziphus*, *Cissus*, *Allophyllus*, *Lepisanthes*, *Lannea*, *Syzygium*, *Memecylon*, *Coccinia*, *Opuntia*, *Benkara*, *Canthium*, *Ixora*, *Pavetta*, *Manilkara*, *Diospyros*, *Jasminum*, *Azima*, *Salvadora*, *Carissa*, *Carmona*, *Cordia*, *Ehretia*, *Solanum*, *Premna*, *Breynia*, *Drypetes*, *Phyllanthus*, *Securinegra*, *Asparagus*, *Phoenix*). Commonly visits flowers of trees and shrubs to eat nectar or buds (e.g. *Capparis*, *Erythrina*, *Prunus*, *Salmalia*, *Spathodea campanulata*, *Woodfordia fruticosa*, *Loranthus* and *Careya arborea*); individuals also noted as eating petals, including those of *Bauhinia variegata*, *Tecomella undulata* and *Pisum sativum*, and whole flowers of *Clitoria ternatea*, *Clerodendron infortunatum* and *Tabernaemontana divaricata*. Invertebrate component of diet seems to be large; includes adult and larval lepidopterans, dipterans (e.g. mosquitoes), ephemeropterans (e.g. mayflies), hymenopterans (e.g. ants, including *Camponotus compressus*, and bees), coleopterans (e.g. *Myllocerus* weevils), hemipterans (e.g. aphids), winged termites (Isoptera), cockroaches (Blattodea) and orthopterans (e.g. *Chrotogonus*). Caterpillars found to be important part of diet of adults and nestlings during breeding season in S India (Tamil Nadu). Prey not always small; one adult attacked and consumed a large preying mantis (Mantidae). One attacked and maimed (but not seen to consume) a 4-cm house gecko (*Hemidactylus flaviviridis*), and another seen to eat recently ejected tail of same; record of nestling 5–6 days old being fed with 9-cm juvenile lizard (*Calotes versicolor*) and dying shortly after trying to eat it. Often in pairs; also large loose flocks in non-breeding season, sometimes assembling in fruiting trees, e.g. up to 100 individuals can be attracted to large fruiting fig (*Ficus*). Usually arboreal, but often captures prey in short aerial sallies from perch, sometimes vertically upwards; also regularly descends to ground and hops about.

Breeding. Breeds Apr–Oct (mainly Jun–Jul) in W India, although usual season given as Aug–Mar (associated with fruiting season) in Tamil Nadu; in Sri Lanka thought to follow rainfall patterns, nests Jan–May in W & S, with second broods as late as Aug–Sept, and first brood Oct–Dec in E (i.e. during monsoon); in Myanmar, May–Sept in N and Apr–Aug in S; Apr–Jul in N Thailand; up to four broods annually. Occasionally two or more pairs nest in fairly close association, almost in loose colony. In apparent courtship display, male spreads out wings above head and slowly flutters them up and down while tail fanned and depressed. Nest a simple cup, sometimes neat, sometimes flimsy, built from variety of materials, depending on availability, usually grasses, plant fibres and rootlets, bound with cobwebs, lined with fine grass, mammalian hair and other slender fibres; 70% of nests in Tamil Nadu had outer wall formed with dry petioles of *Cassia auriculata*, along with stems and branches of a few other herbs, this wall often covered by layer of *Desmodium triflorum* strands, inner lining invariably of slender stems of the grass *Eragrostis tenella*, elsewhere in India two nests in an industrial estate constructed 50% of copper wire and 50% plant material; nest usually 2–3 m up, regularly lower (down to 0·5 m) or higher (to 18 m), in upright fork or similar site in shrub, tree, creeper, palm, hedge or cactus, in Tamil Nadu preferentially in thorny bush (most in *Xeromphis spinosa* and *Dichrostachys cinerea*); a few records of nests almost on ground in tufts of grass, in E of range (race *stanfordi*), and many others found in highly man-modified situations, including on top of stump in the open, in potted house-plant, on chandelier in drawing room, and on luggage rack of Indian bus (in daily operation); previous year's nest sometimes reused. Clutch 2–4 eggs, usually 2–3 in S of range, 3–4 in N; incubation mainly or entirely by female, usually from second egg, period 11–14 days; chicks fed by both sexes, nestling period 12–16 days (usually 12 days); young fed for at least 6 days, probably much longer, after fledging. Broods sometimes parasitized by Jacobin Cuckoo (*Clamator jacobinus*). Nests often ill-concealed, prone to predation; of 134 eggs in Tamil Nadu, only 8·3% survived to fledging, predators were snakes, mongooses (*Herpestes*), coucals (*Centropus*) and blue-magpies (*Cissa*); in Pakistan often robbed by crows (Corvidae) and adult *Calotes* lizards, and one nestling consumed by saw-scaled viper (*Echis carinatus*).

Movements. Resident, but subject to local movements in response to environmental conditions. In India, W populations may follow rain into driest areas, NE populations descend from mountainous regions in cold weather, and lowland S populations move uphill in hot season. Thought to be partially migratory in Bhamo district of Myanmar, where large numbers arrive to breed, probably having wintered at lower altitudes. Roosts communally, sometimes in large numbers, in non-breeding season.

Status and Conservation. Not globally threatened. Generally common and familiar, even in heavily populated areas. Abundant throughout much of India, Sri Lanka, Nepal and Bangladesh; rare in S China. In Pakistan, previously scarce and local in Sind, but generally common around Lahore; spread of irrigation through Sind has resulted in massive expansion of population and range in this region. Status in Myanmar poorly known. First recorded in Thailand in Feb 1996. This species is a common cagebird in many regions, but trapping pressure has not affected its population. An active seed-disperser and pollinator for many plants, it thus plays a vital ecological role. It is, however, an agricultural pest, noted to damage crops of wide range of hard-skinned and soft fruits and pulses, among others.

Bibliography. Ali (1932, 1945, 1969), Ali & Ripley (1996), Ali & Whistler (1933), Ali *et al.* (1996), Balasubramanian (1996), Barnes (1886, 1889), Berry (1894), Betham (1916), Betts (1929, 1931), Bharos (1999), Bhatt & Kumar (2001), Brown (1923), Butler (1875, 1878), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Clunie (1976), Cripps (1878), Currie (1916), D'Abreu (1912), Deignan (1945), Dewar (1905), Dhamke (1997), Dharmakumarsinhji (1955), Dhondt (1977), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Étchécopar & Hüe (1983), Ferguson & Bourdillon (1903–1904), Finn (1902), Fleming & Traylor (1968), Gill (1922–1925), Grimmett *et al.* (1998), Harington (1902, 1909a, 1909b), Harrison (1999), Harvey (1990), Hoffman (1998a), Hollom *et al.* (1988), Hopwood (1912), Hume (1888), Hume & Davison (1878), Inglis (1896, 1901, 1922), Inskipp & Inskipp (1991), Johnson, J.M. (1989), Kumar & Bhatt (2000), Lamba (1968), Legge (1983), Lever (1987), Lewis (1898), Macdonald (1906), MacKinnon & Phillipps (2000), Mason & Lefroy (1912), McCann (1932), Meyer de Schauensee (1984), Mukherjee (1995), Oates (1877), Pande (2003), Perreau (1910), Rasmussen & Anderton (2005), Reid (1881), Richards (1918), Ripley (1982), Ripley *et al.* (1988), Roberts (1992), Robson (1996d, 2000), Rothschild (1921), Santharam (1997), Sharma (2000), Siromoney (1963), Smythies (1986), Solomon Raju *et al.* (2004), Stanford & Mayr (1940–1941), Stanford & Ticehurst (1931), Stevens (1914–1915), Stuart Baker (1892–1893), Ticehurst (1933), Tooth (1901b, 1902), Urfi & Jethua (1998), Venning (1912), Vijayan (1980), Ward (1906–1908), Watling (1983b), Whistler (1930), Whistler & Kinnear (1932), Whitehead (1911), Wickham (1929–1930), Zheng Guangmei & Zhang Cizu (2002).

29. Sooty-headed Bulbul

Pycnonotus aurigaster

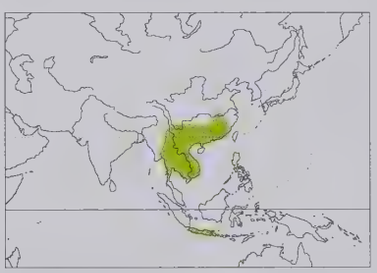
French: Bulbul cul-d'or **German**: Kotilangbülbül **Spanish**: Bulbul Ventridorado

Taxonomy. *Turdus aurigaster* Vieillot, 1818, Caffraria; error = Java.

Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species forms a superspecies with *P. cafer*; sometimes treated as conspecific owing to interbreeding in Myanmar; hybrids earlier described incorrectly as separate species (*P. nigropileus* and *P. burmanicus*). Several variable populations in Myanmar and S China reflect a hybrid origin; further review necessary, and some listed races may not be valid. Proposed races *deignani* (SE Thailand) and *innitens* (SC Thailand) indistinguishable from *thais*; and *chrysorrhoeus*, *crocorrhous* (both Java) and *martini* (Sumatra) inseparable from nominate. Races *chrysorrhoides* and *resurrectus* formerly known respectively as *atricapilla* and *insularis*, but these two names invalid, as preoccupied. Nine subspecies provisionally recognized.

Subspecies and Distribution.

P. a. latouchei Deignan, 1949 – S China (SW Sichuan and W & S Yunnan E to S Hunan and NE Guangxi) and E Myanmar E to NE Thailand, N Laos and N Vietnam (W Tonkin).
P. a. chrysorrhoides (Lafresnaye, 1845) – SE China.
P. a. resurrectus Deignan, 1952 – N Vietnam (E Tonkin, N Annam) and SE China (W Guangdong, Nao Chow Tao).
P. a. klossi (Gyldenstolpe, 1920) – SE Myanmar and N Thailand.
P. a. schauenseei Delacour, 1943 – S Myanmar (C Tenasserim) and SW Thailand.
P. a. thais (Kloss, 1924) – C & SE Thailand and C Laos.
P. a. dolichurus Deignan, 1949 – C Vietnam (C Annam).
P. a. germani (Oustalet, 1878) – extreme SE Thailand, Cambodia and S Indochina.
P. a. aurigaster (Vieillot, 1818) – Java; Bali (possibly introduced).
Introduced (nominate race) in Singapore, Sumatra, Borneo (Kalimantan), S Sulawesi (in and around Ujung Pandang) and Buton I.



Descriptive notes. 19–21 cm; 40–50 g. Medium-sized, garrulous, conspicuous bulbul with short crest. Nominate race has lores and face to below and around eye dull black, cap slightly glossy black; ear-coverts white, sometimes tinged pale brown; upper neck pale ash-grey; mantle and back greyish-brown with paler grey fringing (blotchy effect), becoming paler ash-grey on rump and white on uppertail-coverts (conspicuous in flight), longest rump feathers tipped pale grey; lesser and median wing-coverts as mantle, greater coverts dark brown with narrow pale grey outer webs; tertials and secondaries as their coverts; primary coverts sooty brown with pale ash-grey tips, primaries the same except that outer webs also finely edged pale grey; tail sooty black, prominently tipped white; chin and upper throat dull black, lower throat white; breast and flanks whitish, sullied unevenly with pale grey; mid-belly whitish, undertail-coverts bright golden yellow; iris dark brown or reddish-brown; bill and legs black. Sexes alike. Juvenile has browner crown, paler cheeks, and duller, paler vent. Race *resurrectus* has entire underparts suffused smoky buff; *chrysorrhoides* is larger than nominate, with more uniform mantle, longer crest feathers, bright red vent; *dolichurus* is similar to previous, but shorter wings, virtually unglossed black crown, scarlet-red undertail-coverts; *latouchei* is also similar, but has upperparts slightly darker greyish-brown, fringed with darker ashy; *klossi* differs from last in relatively small size, shorter crest, slightly browner upperparts (whitish-brown fringes, producing mottled effect), scarlet-red undertail-coverts; *schauenseei* is like previous but smaller still, with shorter crest, slightly browner above and below, smaller and greyer tips of rectrices, and undertail-coverts rosy red to red-orange (variable); *thais* has relatively unglossed crown, undertail-coverts rich yellow to bright red (variable); *germani* has crown feathers dull brown and unglossed (with paler fringing), other head markings dull brown, pale rump less pronounced, undertail-coverts chrome-yellow, white tips of outer rectrices smaller and duller than previous. Voice. Song chatty and cheerful, a shrill, gurgly sequence as "whi-wi-wiwi-wiwi", usually with stressed introductory note, also as "u'whi'hi'hu" or "wh'i-i-wi". Also produces sharp single or double notes, varying in pitch and intonation.

Habitat. Scrub, second growth, grassy areas, forest clearings, woods, towns, gardens, cultivation; favours thinly wooded hillsides, scattered pines (*Pinus*) and dry agricultural areas in S China. Generally in lowlands, but ascending locally to 1830 m.

Food and Feeding. An opportunist and generalist, probably ecologically similar to *P. cafer* but much less studied. In pairs during breeding season; non-breeding flocks in S China sometimes contain 80 individuals. Often descends to the ground.

Breeding. Generally Mar–Apr in SE Asia and Mar–Jul in S China; throughout year, but most often in Mar–Jun and Aug, in Java; multi-brooded. Nest a compact but flimsy, cup-shaped structure, usually situated in bush or small tree, 1–3 m above ground, sometimes a little lower or much higher. Clutch 2–4 eggs, very rarely up to 6; no information on incubation and fledging periods.

Movements. Resident.

Status and Conservation. Not globally threatened. Common in Hong Kong, and fairly common over a broad range in S China; fairly common in SE Asia. Common in Java, despite heavy trapping for cagebird trade. Being commensal with man in many regions, and tolerant of human perturbations of the natural environment, this species is not likely to become threatened.

Bibliography. Baltzer (1997), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Coates & Bishop (1997), Coomans de Ruiter & Maurenbrecher (1948), Corlett (1998), Daltry & Momberg (2000), Deignan

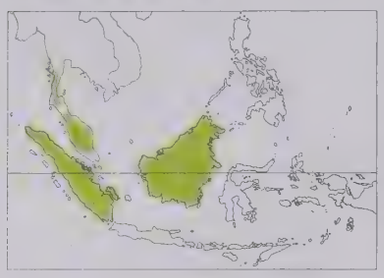
(1949), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Gibson-Hill (1949), Gyldenstolpe (1920), Harington (1902), Hellebrekers & Hoogerwerf (1967), Holmes (1997), Hume & Davison (1878), Lekagul & Round (1991), Lever (1987), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), Madoc (1976), van Marle & Voous (1988), Meyer de Schauensee (1984), Oustalet (1903), Riley (1938), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993b), Smythies (1986, 1999), Stepanyan (1995), Thewlis *et al.* (1996), Webster (1975), Wells (1990a, 2005), White & Bruce (1986), Zheng Guangmei & Zhang Cizu (2002).

30. **Puff-backed Bulbul**

Pycnonotus eutilotus

French: Bulbul laineux **German**: Wollrückenbülbül **Spanish**: Bulbul Lanudo
Other common names: Puff-backed Brown Bulbul

Taxonomy. *Brachypus eutilotus* Jardine and Selby, 1837, Singapore.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Aberrant member of genus, possibly better treated in a separate genus, *Euptilosus*. Perhaps more clearly allied to other "bar-backed" forms (e.g. *P. nigriceps*) than to "typical" ones (e.g. *P. capensis* and *P. cafer* complexes). Monotypic.
Distribution. Extreme S Myanmar (extreme S Tenasserim), S Thailand, Peninsular Malaysia, Sumatra, Bangka and Borneo.



Descriptive notes. 20–22 cm; 30–43 g. A chunky, bicoloured, relatively quiet bulbul with large bill, short crest often raised at shallow angle; feathers of lower back dense and elongated, sometimes raised into a "puff" and revealing blackish bases. Whole face, including ear-coverts and down to jaw level, is ashy grey; crown brown with greyish tinge, central feathering slightly elongated; upper neck to rump dark rich brown, feathers of lower back to rump dark sooty brown at base, rump feathers black laterally and across rear edge, these parts broadly tipped whitish; uppertail-coverts chestnut-brown; upperwing-coverts and tertials as mantle; secondaries, primary coverts and primaries the same, except that inner webs are dark sooty brown and outer webs edged rufous-olive; tail dull chestnut-brown, outer feathers boldly tipped white on inner webs; whitish below, breast washed greyish, flanks ashy, lower belly and vent tinged light yellow; underwing creamy white, primary coverts sooty, carpal feathering buff-yellow, axillaries silky white; iris light red to crimson (variaton age-related?); bill black; legs dark slaty grey. Sexes similar, female possibly with slightly less prominent white tail tips. Juvenile is like adult, but tail pale-fringed only, without white flashes. Voice. Usually rather silent, but presence often revealed by a "whimsical trill" from high perch, difficult to describe but sounding like loud, rather high-pitched, slurred, quavering warble with first note more emphatic, "tchui'uui tch'i-iwi'iwi, iwu'iwi-u", or "tch'uwi'i'iwi"; at its simplest can be transcribed as "celery-celery", but many variants more complex, becoming soft, hurried yodel with numerous sliding pitch changes and long-vowel combinations, e.g. "cheeu cheeu eeraloo eeraloo" or "chiaee-ruraleeoo". Songs usually descend distinctly in pitch and sound melancholic.
Habitat. Usually found in mature lowland broadleaf evergreen forest (often in lightly or heavily logged sites), and forest edges. Also in tall and stunted kerangas and fire padang, subcoastal peatswamp-forest, mature abandoned *Albizia* plantations, and tall secondary growth in vicinity of original forest. Most sightings from plains level and low slopes, except on Mt Jerai (Kedah), in NW Peninsular Malaysia, where ascends to 1200 m; highest record in Borneo from 1300 m.
Food and Feeding. Feeds on berries and other fruits, also insects. The only specific foraging records are of visits to fig trees: banyans (*Ficus benjamina* or *F. microcarpa*) and 14 of 25 *Ficus* in study at Kerau (Peninsular Malaysia), with mean minimum-diameter fruit size 5·4–15·5 mm. Found in singles or pairs, feeding largely on berries. Forages in lower and middle strata and, less regularly, in canopy; most conspicuous at forest edge. Often visits fruiting trees and shrubs to glean fruits, regularly joining other bulbuls. Also gleans insects from foliage, and sometimes joins mixed foraging flocks.
Breeding. Breeds Mar–Jun in Borneo; recent fledgling found on 7th May in Peninsular Malaysia. Rump feathers raised and puffed out in display. One nest was a small neat cup placed 60 cm above ground in a spiny palm. Clutch 2 eggs; no information on incubation and nestling periods; fledglings fed by adults for at least 10 weeks.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Uncommon to locally fairly common. Extinct in Singapore since 1836 (although recent unconfirmed sightings in watershed forests there). Preference for plains-level forest places this bulbul at risk; it is more reliant on tall lowland forest than are most bulbuls, suggesting that it is far more susceptible to the catastrophic clearance of this habitat in the Sundaic region. Its population should be monitored accordingly. Occurs in a range of important protected areas, including Taman Negara National Park, in Peninsular Malaysia, and Tanjung Puting National Park, in Borneo (Kalimantan).

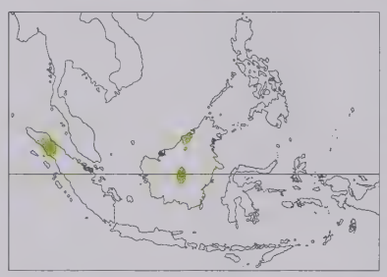
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31. **Blue-wattled Bulbul**

Pycnonotus nieuwenhuisii

French: Bulbul à lunettes bleues **German**: Blaubrillenbülbül **Spanish**: Bulbul Ojiazul
Other common names: Nieuwenhuis's Bulbul

Taxonomy. *Poliolophus Nieuwenhuisii* Finsch, 1901, Upper Kayan River, central Borneo.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Some evidence that this taxon is a hybrid between two Sundaic species, one of which must certainly be *P. atriceps*; the appearance of novel characters (such as, in this case, an enlarged and differently coloured eyering) not unprecedented in pycnonotid hybrids. Nevertheless, the case for hybrid status remains tentative, and this enigmatic form is better maintained as a true species until further details come to light. Two subspecies recognized.
Subspecies and Distribution.
P. n. inexspectatus (Chasen, 1939) – NW Sumatra.
P. n. nieuwenhuisii (Finsch, 1901) – N & C Borneo (Brunei, Kalimantan).



Descriptive notes. 18 cm. Nominate race has head dark grey-brown to blackish, with vaguely hooded effect; cheeks and forehead washed greenish-olive; mantle rich olive-green, loose and plush feathering of lower back banded darker at base (showing as dark bars when ruffled), rump paler green-grey; wings and tail dark greyish-brown, broadly fringed olive-green on remiges and rectrices, latter with dark brown subterminal band and small whitish tips; chin and throat dark grey-brown to blackish, merging with dark olive of breast, this in turn merging with pale greenish-yellow of belly and vent; iris warm brown, conspicuous pale fleshy blue eyelids; bill black; legs plumbeous. Sexes alike. Juvenile undescribed. Race *inexspectatus* is slightly brighter and paler, marginally greener and less greyish on upperparts, paler yellow on underparts, with head less blackish, more grey, dark throat contrasting less sharply with breast, iris red, edges of eyering pale blue, bill and legs black. Voice. Unknown; "harsh but quiet notes" thought to be made by this bulbul in Brunei.
Habitat. Insufficient data. Sumatran specimen was taken in low shrubbery on a river island, at 700 m; the Bornean one in tall primary evergreen forest at 610 m, and reported at all levels in same habitat, down to 60 m in N (Brunei). Given the paucity of records, very few conclusions can be drawn regarding the ecology of this species.
Food and Feeding. Insufficient data. In Brunei, seen while feeding with other bulbuls (including *P. melanoleucos* and *P. atriceps*) on fruiting trees, including *Macaranga aetheadenia*. In Sumatra, the single specimen perched near (but not directly associating with) large numbers of *P. atriceps* gathered at fruiting shrubs.
Breeding. No information.
Movements. Presumably resident; perhaps some movements in response to food supplies.
Status and Conservation. Not globally threatened. Not evaluated. Restricted-range species: present in the Bornean Mountains EBA and Sumatra and Peninsular Malaysia EBA. Extremely rare: only two specimens known, and very few observations. After the Sumatran specimen (*inexspectatus*) was taken, the collector spent several days in combing the area for a second individual, but failed to encounter one; in Borneo, the site of discovery of nominate race was revisited after several years, but no further individuals were found. Only subsequent information stems from recent reports from Kuala Belalong, in Batu Apoi Forest Reserve (Brunei). Although this taxon was previously listed as globally threatened, it was recently removed from consideration because of the belief that it is probably a hybrid; until this theory is proven, however, it seems premature to erase all trace of it. Should it be found to be a valid species, it would certainly qualify for inclusion in either the Data-deficient or Critical categories. Primary objective is to determine whether it is a true species; to achieve this aim, renewed searches of likely habitat should be conducted, focusing on regions near the specimen localities, and Batu Apoi Forest Reserve.
Bibliography. Chasen & Hoogerwerf (1941), Collar & Andrew (1988), Collar *et al.* (1994), Dickinson & Dekker (2002b), Finsch (1901), Lambert & Collar (2002), Long (1992), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Smythies (1999), Stattersfield *et al.* (1998), Wells (1985c), Williams (2002), Williams & Mitchell (1993).

PLATE 17 ➤



PLATE 17

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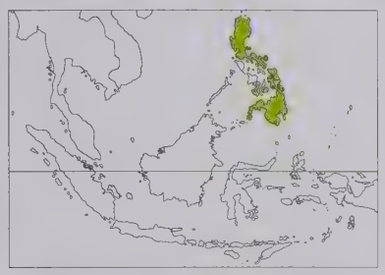
cm 10

32. Yellow-wattled Bulbul

Pycnonotus urostictus

French: Bulbul à lunettes jaunes **German**: Gelbbrillenbülbül **Spanish**: Bulbul Ojigualdo

Taxonomy. *Brachypus urostictus* Salvadori, 1870, Luzon, Philippine Islands.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species may merit separation at genus level. Racial affiliation of birds recently recorded on Negros uncertain; tentatively included in race *atricaudatus*, but further study needed. Five subspecies recognized.
Subspecies and Distribution.
P. u. ilokensis Rand & Rabor, 1967 – N Philippines (N Luzon).
P. u. urostictus (Salvadori, 1870) – C & S Luzon, Polillo and Catanduanes.
P. u. atricaudatus Parkes, 1967 – Samar, Biliran, Leyte, Panaon, Bohol and Negros.
P. u. philippensis (Hachisuka, 1934) – Dinagat, Siargao, Bucas and Mindanao (except Zamboanga Peninsula).
P. u. basilanicus (Steere, 1890) – W Mindanao (Zamboanga Peninsula) and Basilan.



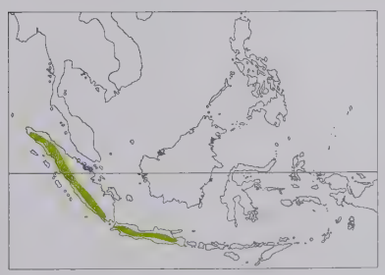
Descriptive notes. 19 cm; male 21–28 g, female 22–26 g. Medium-sized, dull brown bulbul with strongly rounded tail, elongated crest feathers often raised. Nominate race has crown brownish-grey, browner lores, cheeks and neck; upperparts mid-brown, tinged green; central back feathers with black terminal spots, lateral back feathers blackish-brown and broadly and conspicuously tipped white (this feature often concealed); wings dark brown, flight-feathers fringed olive-green; tail brownish-olive, darker distally, narrowly but conspicuously tipped white; throat and underparts pale brownish-grey, becoming whitish on belly and undertail-coverts; iris brown, bare fleshy eyelids chrome-yellow; bill black to dark horn; legs greyish-brown. Sexes alike. Juvenile undescribed. Race *ilokensis* has underparts darker, bill larger, white rectrix tips less extensive; *atricaudatus* has rectrices much blacker, with white tips more extensive, especially on central pair; *philippensis* has large white tail tips as previous, but paler underparts, especially breast; *basilanicus* differs from last in having more olive back, white extending farther into breast. Voice. In general highly vocal. Variable call a loud musical trisyllabic whistle (easily imitated), "wee-a-weeeee" or "wee-eeee-ee", each phrase lasting c.1 second, and given every 4–5 seconds; also a longer, more complicated series of whistles ending in "wee-eeee-ee", and other high-pitched squeaky whistles.
Habitat. Forest edge, open woods, second growth in lowlands, to 1000 m; tends to avoid intact forest.
Food and Feeding. Poorly known. Singles, pairs or small (family?) parties forage mainly on fruit.
Breeding. Breeding recorded in Mar, Apr and Aug; birds with enlarged gonads in May on Samar. Nest cup-shaped; usual clutch 3 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally fairly common. Able to persist in quite highly fragmented habitats. Occurs in several protected areas, including Rajah Sikatuna National Park, on Bohol.
Bibliography. Brooks *et al.* (1996), Delacour & Mayr (1946), Dickinson & Dekker (2002b), Dickinson *et al.* (1991), duPont (1971), Gilliard (1950), Goodman & Gonzales (1990), Hornskov (1996), Kennedy *et al.* (2000), Parkes (1967), Rand & Rabor (1959b, 1960).

33. Orange-spotted Bulbul

Pycnonotus bimaculatus

French: Bulbul bimaculé **German**: Goldzügelbülbül **Spanish**: Bulbul Bimaculado

Taxonomy. *Turdus bimaculatus* Horsfield, 1821, Java.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species may merit separation at genus level. As the type material originates from C (not E) Java, the name *barat* is a junior synonym of the nominate; the name *tenggerensis* must therefore be restored for the E Java race. Three subspecies recognized.
Subspecies and Distribution.
P. b. snouckaerti Siebers, 1928 – NW Sumatra.
P. b. bimaculatus (Horsfield, 1821) – SW Sumatra and W & C Java.
P. b. tenggerensis (van Oort, 1911) – E Java.



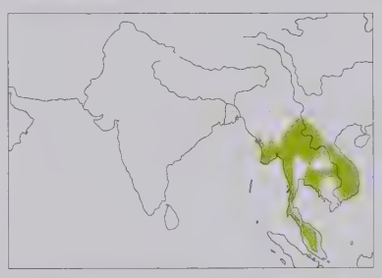
Descriptive notes. 20 cm. Dark-coloured, active, conspicuous uncrested bulbul with rounded tail. Nominate race has crown blackish-brown, lightly fringed greyish; head mostly dark, blackest on lores and centre of forehead, with bright orange supraloral tuft of short bristle-like feathers, a smaller yellow-orange spot over eye; large ear-covert patch pale yellow with greenish tinge; upperparts plain brown; wings dark brown, prominently fringed bright olive on flight-feathers; tail dark brown, feathers fringed bright olive, outer ones tipped white; throat and upper breast dark brown, becoming mottled on lower breast; belly creamy white, vent and undertail-coverts bright yellow; iris red-brown or dark brown; bill black; legs black or dark grey. Sexes alike. Juvenile is duller, with dull brown iris. Race *snouckaerti* has lower breast and belly grey-brown (paler on mid-belly), bill relatively small; *tenggerensis* has smaller supraloral tuft, ear-covert patch mottled dark brown, duller green wing fringing. Voice. Noisy, giving variety of loud, harsh songs, including "toc-toc-toc-toroc" and loud clear "chewlk-chewlk-chewlk", or "chuk-chuk-chooh-chewlewlewlew". Sings often.
Habitat. Edges of primary forest, tall second growth, scrub and elfin forest near summit of mountains; in N Sumatra, used thick secondary vegetation between cultivation, and ventured into freshly burnt swidden clearings. Nests usually found in primary or secondary forest, or at edges and in shrubby clearings. From 800 m to 3000 m.
Food and Feeding. Essentially a frugivore; stomachs of birds from N Sumatra contained fruit, including "red peppers" (*Capsicum*), and smaller proportion of insects, including coleopterans and orthopterans. Visits berry-laden trees and shrubs, including blueberries (*Vaccinium*), in lower and middle storeys.
Breeding. Breeds throughout year; records from Java show that nesting occurs in all months, with peak in May. Nest a robustly built, cup-shaped structure, similar to that of congeners, placed 1–5 m above ground in tree or shrub. Clutch 2 eggs, sometimes 3; no information on incubation and fledging periods.
Movements. Resident. In non-breeding season, larger aggregations form locally, some of these gathering to roost communally.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA and Java and Bali Forests EBA. Locally common; uncommon in N Sumatra. Prefers high-altitude forests, which are relatively secure, and tolerates highly degraded habitats, suggesting that it is not at any immediate risk. Large populations survive within Gunung Gede-Pangrango National Park, in Java, and Kerinci-Seblat National Park, in Sumatra. Some trapping for cagebird trade.
Bibliography. Andrew (1985), Becking (1989), Büttikofer (1887), Chasen & Hoogerwerf (1941), Dickinson & Dekker (2002b), Fischer (1999), Hellebrekers & Hoogerwerf (1967), Hoogerwerf (1949a), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Mees (1996), Robinson & Kloss (1920), Sargeant (1997), Stattersfield *et al.* (1998), Tilford (2000), Tobias (1995), Tobias & Phelps (1994).

34. Stripe-throated Bulbul

Pycnonotus finlaysoni

French: Bulbul de Finlayson **German**: Streifenkehlbülbül **Spanish**: Bulbul de Finlayson
Other common names: Striped-throated/Streak-throated Bulbul

Taxonomy. *Pycnonotus Finlaysoni* Strickland, 1844, "probably from some of the Malasian [*sic*] islands"; error = Melaka, south-west Peninsular Malaysia.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species may be rather distantly related to the "*P. capensis* complex" and the "*P. cafer* complex". Race *davisoni* differs morphologically and possibly vocally from others; merits further study to assess its taxonomic status. Three subspecies recognized.
Subspecies and Distribution.
P. f. davisoni (Hume, 1875) – S & E Myanmar (Arakan S to R Sittang).
P. f. eous Riley, 1940 – S China (S Yunnan), Thailand and Indochina.
P. f. finlaysoni Strickland, 1844 – S Myanmar (Tenasserim S from R Sittang), S Thailand and Peninsular Malaysia.



Descriptive notes. 19–20 cm; 24–32 g. Medium-sized, dull-coloured, lively bulbul. Nominate race has dark brown lores, sometimes with tiny red supraloral spot; rest of face including ear-coverts, forecrown, chin and throat dark olive-brown with bright yellow centres and shaft streaks; rest of cap to back dull olive-brown with greyish cast, especially on upper neck, where shaft streaks ashy; rump and uppertail-coverts slightly lighter, warmer brown; upperwing similar, with bright olive-green outer webs of primaries forming panel on closed wing; yellow underwing-coverts show at carpal joint; tail olive-green with brown shafts and brighter yellowish-green fringes on feather bases, outermost feathers (at least T5 and T4) with narrow whitish margins at tips; breast greyish with narrow whitish streaks, lower breast and upper belly murky white, central belly to undertail-coverts pale lemon-yellow, occasionally with hint of ochraceous; flanks uniform olive-brown, sometimes with olivaceous tinge; iris dark red-brown; bill dusky black; legs blackish-brown or dark plumbeous. Sexes alike. Juvenile has crown, upperparts and breast paler and browner, no yellow streaks on forecrown and throat, white shaft lines on breast less prominent, belly to undertail-coverts only faintly yellow, iris duller and greyer. Race *eous* is slightly brighter, above and below, than nominate; *davisoni* lacks obvious yellow streaks on forecrown and ear-coverts, has smaller throat streaks, greener crown and rump, rather darker rest of upperparts, breast and flanks, and whitish or brownish-white eyes. Voice. Song a throaty, variable, measured sequence of loud crisp notes, transcribed as "whit-chu which-ic" or "whit whit-tu-iwhit-whitu'-tu"; sometimes resembles song of *P. plumosus* in sound quality and pattern, e.g. "kwik kwok kwo", a hard "pikwik", and rather rich "pik kwok, chikerik, pik wik wok".
Habitat. Secondary growth, scrub, open areas, edges and clearings in broadleaf evergreen, mixed deciduous, evergreen forest and strand (including casuarina) woodland. Also found along forested riverbanks, at roadsides, and in dense young regrowth (e.g. *Eupatrium*), coastal scrub, heavily degraded forest, low and patchy secondary growth around grazing grounds, paddylands, shifting cultivation, tea plantations, rubber plantations, and overgrown gardens. Generally avoids intact forest and dry dipterocarp forest. Lowlands, locally to 1300 m, and recorded to 1770 m in Peninsular Malaysia.
Food and Feeding. A generalist. Diet mainly berries and other fruit, including figs (banyans and *Ficus trichocarpa*, fruit diameter 15·5 mm), *Macaranga tanarius*, and the fleshy aril of *Acacia mangium* seeds; also catches many insects. Usually encountered singly or in pairs; no more than five seen together (thus probably family groups). Frequents middle and lower storeys, gathering to feed in fruiting trees and shrubs with other bulbuls. Sometimes gathers at termite (Isoptera) swarms

On following pages: 35. Yellow-throated Bulbul (*Pycnonotus xantholaemus*); 36. Yellow-eared Bulbul (*Pycnonotus penicillatus*); 37. Flavescent Bulbul (*Pycnonotus flavescens*); 38. White-browed Bulbul (*Pycnonotus luteolus*); 39. Yellow-vented Bulbul (*Pycnonotus goiavier*); 40. Olive-winged Bulbul (*Pycnonotus plumosus*); 41. Streak-eared Bulbul (*Pycnonotus blanfordi*); 42. Cream-vented Bulbul (*Pycnonotus simplex*); 43. Asian Red-eyed Bulbul (*Pycnonotus brunneus*); 44. Spectacled Bulbul (*Pycnonotus erythropthalmos*).

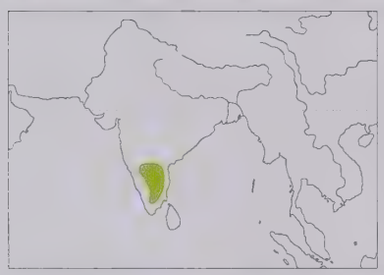
to feed on flying adults, and regularly drops to the ground to feed. Frequently makes aerial sallies after moths (Lepidoptera), termites and other insects, sometimes pursuing them for long distances.
Breeding. Usually Feb–Sept. Nest an open cup-shaped structure c. 6 cm in diameter, rather deep and strongly woven (but virtually see-through), often composed of dry grasses bound with fine creeper stems (often including rhizomes of the climbing fern *Drymoglossum piloselloides*), lined with slender fibres and grasses, with fragments of dead leaves incorporated into outer wall for camouflage, usually placed in upright fork of small leafy bush (e.g. *Melastoma*) or sapling, often isolated in clearing or at roadside etc.; other recorded sites are on branch of forest tree leaning over road, in creepers, and in low clump of spiny stemless palm on grazing ground; nests in Myanmar, Thailand and Peninsular Malaysia 0·5–6 m above ground, but typically towards lower end of this range (often less then 1 m up). Clutch 2–3 eggs, apparently 2 in Peninsular Malaysia; no information on incubation and fledging periods; both pair-members tend fledglings.
Movements. Resident, subject to some minor movements.
Status and Conservation. Not globally threatened. Locally common, at least in N Thailand, S Laos and Malaysia; rare in S China. Current status in Myanmar unclear; was previously not uncommon around Yangon and the Irrawaddy delta, and very common in lowlands of Tenasserim, where once thought to be the commonest bulbul. Given this species' preference for edge habitats and degraded forests, it is unlikely ever to face any serious threat of extinction. Occurs in several protected areas, eg Taman Negara National Park, in Peninsular Malaysia.
Bibliography. Armstrong (1876), Cheng Tsohsin (1987), Daltry & Momberg (2000), Deignan (1945), Delacour (1943), Dickinson & Dekker (2002b), Duckworth, Salter & Khounboline (1999), Ford & Davison (1995), Frith (1981a, 1981b), Gibson-Hill (1949), Gyldenstolpe (1913, 1916), Harington (1909b), Hopwood (1919), Hume & Davison (1878), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Madoc (1976), Medway & Wells (1976), Meyer de Schauensee (1984), Muhammad Afiq Aliudin (2000), Oates (1877, 1878), Oustalet (1903), Riley (1938), Robson (2000), Robson *et al.* (1993b), Smythies (1986), Stanford (1935), Stepanyan (1995), Thewlis *et al.* (1996), Ticehurst (1933), Wells (2005).

35. Yellow-throated Bulbul

Pycnonotus xantholaemus

French: Bulbul à menton jaune **German**: Goldkehlbülbül **Spanish**: Bulbul Gorgigualdo
Other common names: Yellow-eared Bulbul

Taxonomy. *Brachypus xantholaemus* Jerdon, 1845, Eastern Ghats west of Nellore, India.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This is a rather aberrant species, with no obvious close relative; its generic placement requires further study. Monotypic.
Distribution. S India: S Deccan plateau in E Karnataka, S Andhra Pradesh and N Tamil Nadu.



Descriptive notes. 20 cm. A medium-sized, rather silvery, pallid, unobtrusive bulbul. Crown, nape, cheeks, ear-coverts and side of neck are yellowish-olive, mantle, back and scapulars to uppertail-coverts pale grey; upperwings greyish-brown, flight-feathers and wing-coverts edged yellowish-green; rectrices greyish, darkening on distal third, edged yellowish-green, tipped off-white or yellowish; chin and throat strikingly pure yellow, contrasting with grey breast; belly and flanks whitish-grey, vent and undertail-coverts bright pale yellow; iris brown or orange-brown; bill and legs black. Sexes alike. Juvenile has browner breast. VOICE. Song a rich, low, burbling, warbling series, individual notes very quick, at first rising and then falling in pitch, then more constant; reminiscent of *P. luteolus* song, but more deliberate, clearer, harder and airier, and incorporating many more sweet notes. Frequently given call a very brief disyllabic chickle, "teetle-lerp" or "tleep-tillurp", simple compared with calls of congeners; slightly nasal "rhid-tu-tu" also reported, perhaps a different interpretation of same call.
Habitat. Usually found on rocky wooded hillsides and isolated hillocks at 600–1300 m. Frequents slopes with tall shrubs and boulders, thorn-scrub and moist deciduous woodland, often with dense *Lantana* and *Ziziphus*.
Food and Feeding. Diet berries, also insects. Berries include especially those from shrubs such as *Erythroxylon* and *Scutia*, also from other shrubs and trees such as *Lantana camara* (exotic), *Solanum indicum*, *Ziziphus*, *Ficus benghalensis*, *F. nervosa*, *F. montana*, *Canthium dicoccum* and *Phyllanthus reticulata*. Studies at one site suggested that main fruit intake comprised *Solanum indicum* (61%), *Ficus benghalensis* (22%), *Santalum* (11%) and *Ziziphus* (6%). Insects eaten include e.g. caterpillars, picked from ground, branches and leaves, and others such as winged termites (Isoptera) and dragonflies (Odonata), caught during aerial sallies. Skulking but restless; moves alone, in pairs, or in small (family?) groups of up to six individuals, occasionally in mixed flocks, through trees and understorey. Sometimes sits in the open on a rock.
Breeding. Breeds May–Jul. Nest built by female, in one case taking 8 days, in another only 3 days, a large, untidy, clumsy structure (apparently unlike neater nests of most bulbuls), one was constructed from loosely placed coarse twigs and grasses, bound together by cobwebs, lined with fine fibres, sited low down and sheltered by overhanging bush; one was low in dwarf date palm (*Phoenix humilis*), another close to ground in fork of sparse bush, and a third actually on ground (unusual site for a bulbul). Clutch 2–3 eggs, laid on consecutive days; incubation by only one of pair, presumably female; one clutch apparently took 20 days to hatch (this period suspiciously long, requires verification), after which female brooded chicks for a further 7 days, and both parents fed young, which left nest 13 days after hatching.
Movements. Resident.
Status and Conservation. VULNERABLE. Restricted-range species: confined to the Southern Deccan Plateau Secondary Area. Common at some sites, but extremely local. One old record from Kerala; may occur in Orissa, but no confirmed records. Probably declining, as suitable habitat is being cleared in many areas, or being removed to make way for quarries, grazing land and agricultural expansion. Collection of wood for fuel an additional threat. Present in very few protected areas, but does occur within Mudumalai and Sri Venkateshwara National Parks. Further surveys should attempt to clarify the range of this species, and all key sites should be afforded official protection.
Bibliography. Ali (1969, 1996), Ali & Ripley (1996), Allen (1908), Butchart & Stattersfield (2004), Chaitra *et al.* (2000), Collar *et al.* (2001), Dewar (1905), Dickinson *et al.* (2002b), Gee (1995), Grimmett *et al.* (1998), Karanth (1989), Karthikeyan (1995), Nichols (1943–1945), Rasmussen & Anderton (2005), Ripley (1982), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Subramanya & Prasad (1996), Subramanya, Karthikeyan *et al.* (1990), Subramanya, Prasad & Karthikeyan (1995), Venkataswamappa & Chaitra (1999), Whistler & Kinnear (1932).

36. Yellow-eared Bulbul

Pycnonotus penicillatus

French: Bulbul oreillard **German**: Schmuckbülbül **Spanish**: Bulbul Orejudo
Other common names: Yellow-tufted/Ceylon/Sri Lanka Bulbul

Taxonomy. *Pycnonotus penicillatus* Blyth, 1851, Sri Lanka.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species often placed in a monotypic genus, *Kelaartia*, to which it should perhaps be returned. Monotypic.
Distribution. Highlands of Sri Lanka.



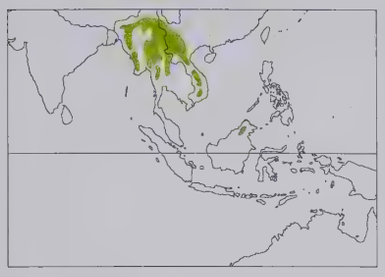
Descriptive notes. 20 cm; 36–37 g. A striking, rotund bulbul. Crown, lores, cheeks, forehead, eyestripe and moustachial stripe are black; head adorned with bristly yellow tufts to rear of eye, both above and below, and whitish postorbital spot; distinctive white streaks beginning at base of upper mandible form upright plumes ("horns") above eye; hindneck to uppertail-coverts olive-green, this colour extending onto upperwing-coverts; inner webs of flight-feathers and rectrices blackish-brown, the latter washed olive-green, outer webs strongly olive-green; chin and upper throat white, becoming bright yellow on lower throat, rest of underparts deeper and duller, more olivaceous yellow; underside of tail feathers tipped yellowish; brightness of greens and yellow in plumage variable; iris orange-brown or reddish-brown; bill black; legs dark bluish-grey. Sexes alike. Juvenile has head feathers edged whitish, legs grey-brown. VOICE. Often calls when flying between trees; main vocalization an even-tempo, energetic series of 2–7 identical, explosive, ringing notes, "Swink!-Swink!-Swink!". Also brief sputtery chatter, and low "crr crr" in alarm.
Habitat. Forest and adjacent wooded farms, gardens and regrowth, in mid-canopy, thickets and dense undergrowth. Middle to high altitudes, generally 900–2000 m; absent from lowlands.
Food and Feeding. Feeds on fruit. Gathers in small flocks at fruiting trees, often accompanying mixed-species flocks. Fairly shy; generally keeps to dense undergrowth and forest borders. Usually no higher than mid-storey, but ascends to canopy to feast on major fruit sources, gathering at such places with other frugivorous species such as thrushes (*Turdus*) and barbets (*Megalaima*).
Breeding. Feb–May and Aug–Oct. Nest a fairly substantial cup-shaped structure, made from moss, with some leaf fragments, pieces of dry grass (including "elephant grass"), plant stems and rootlets, lined with fine ferns, rootlets, midribs of decayed leaves or fern stems (usually either black or reddish-brown); placed 3–5 m up (sometimes as low as 1 m) in tree or shrub, usually in upright fork, cluster of twigs, or intersecting branches in denser foliage at top of sapling, often over stream or at forest edge. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Sri Lanka EBA. Abundant in Central Province of Sri Lanka. Not at any immediate risk, but small size of its range means that its status requires monitoring. Forest in Sri Lanka is suffering clearance for agricultural expansion, logging and urbanization, and the situation may deteriorate in future. Occurs in a range of protected areas, including Horton Plains National Park, Hakgala Strict Nature Reserve and Peak Wilderness Sanctuary.
Bibliography. Ali & Ripley (1996), Butchart & Stattersfield (2004), Butler (1896), Collar *et al.* (2001), Dickinson *et al.* (2002b), Grimmett *et al.* (1998), Harrison (1999), Henry (1998a), Hoffmann (1998), Lamsfuss (1998), Lewis (1898), Ranawana & Bambaradeniya (1998), Rasmussen & Anderton (2005), Ripley (1982), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

37. Flavescent Bulbul

Pycnonotus flavescens

French: Bulbul flavescent **German**: Gelbwangenbülbül **Spanish**: Bulbul Amarillento
Other common names: Blyth's Bulbul, Round-tailed Green Bulbul; Pale-faced Bulbul (*leucops*)

Taxonomy. *P[ycnonotus]. flavescens* Blyth, 1845, hills between Sandoway and Pyè, Arakan Yoma, west Myanmar.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Nominate race previously separated in genus *Xanthixus* or *Xanthiscus*, and *leucops* initially described in a monotypic genus, *Oreoctistes*; all races currently included within this species are clearly congeneric, but their placement in present genus is debatable. Race *leucops* is geographically remote from others, differs vocally and morphologically (differences far exceed those between all other races), and is a prime candidate for elevation to species rank. Validity of *vividus* and *sordidus* questionable, as individual variation renders both these and nominate virtually indistinguishable in large series. Putative race *pallens* (Assam, in NE India) is inseparable from nominate. Further research on vocal, behavioural and genetic differences between populations required. Four subspecies provisionally recognized.
Subspecies and Distribution.
P. f. flavescens Blyth, 1845 – NE India (S Assam, Meghalaya, Nagaland, Lushai Hills, also reported NE Arunachal), NE Bangladesh (recent record from Sylhet) and W & SW Myanmar (including Arakan Hills).
P. f. vividus (Stuart Baker, 1917) – S China (W & S Yunnan), N & E Myanmar, NW Thailand (S to Kaeng Krachan National Park), N & C Laos and N & C Vietnam.
P. f. sordidus (Robinson & Kloss, 1919) – S Laos and S Vietnam (including Da Lat plateau).
P. f. leucops (Sharpe, 1888) – N Borneo (Mt Kinabalu S to Gunung Mulu and Gunung Murud, and Gunung Lunjut).
Descriptive notes. 21·5–22 cm (mainland races), 17·5–19 cm (*leucops*); 27–35 g. A medium-large, drab, relatively retiring bulbul with fairly stout bill, rather long and heavy tail, crown feathers often raised to form odd conical crest. Nominate race has crown dark brownish-grey with whitish scaling (in fresh plumage, more uniform dull brown when worn), short white preocular supercilium over dusky brown loral spot, greyish ear-coverts; mantle, back, scapulars, rump and uppertail-coverts dull olive-brown, suffused with stronger greenish or yellowish tint in fresh plumage; wings



mid-brown, more olive-brown on outer webs, with brighter and yellower fringing on primaries (usually forming distinct panel); tail dull olive-brown, feathers brighter and yellower at outer fringe, outermost pair with narrow pale tips; chin and throat pale (sometimes washed fulvous, sometimes whitish); breast pale yellowish-brown, variably streaked darker grey brown (usually indistinct), lower belly and undertail-coverts yellow; iris brown to deep reddish-brown; bill black; legs blackish-brown to dark reddish-brown. Sexes alike. Juvenile has forehead and crown uniform olivaceous brown, head generally more yellowish, less prominent supercilium, also more uniformly and warmer brown upperparts, slight rusty fringing on wing feathers, brownish throat and breast without streaked appearance, paler yellow vent, brownish bill. Race *vividus* is slightly darker than nominate on upperparts and flanks, with yellower underparts, sometimes to throat; *sordidus* is darker and less olivaceous above, generally dark grey below, whitish on throat and yellow on vent; *leucops* is smaller, has greyish-brown crown, white supercilium, lores and cheeks contrasting with blackish iris, pale throat, greyish-brown and vaguely streaked breast, deep yellow undertail-coverts (more restricted than nominate but brighter, showing as golden patch in flight), normally grey base of lower mandible. Voice. Less noisy than many bulbuls, but does sing fairly regularly from exposed perch. Main song a crowing chuckle of 3–6 notes, rising and then falling, "brzk, bzeek, zink-zenk-zink", first 2 notes buzzy and deliberate, the rest clearer, shorter and hurriedly tumbled, or more sprightly, evenly spaced version, "jhoi, bwiki-bwiki-bwik", more even in pitch, notes guttural but somewhat musical; often combines two song phrases without a pause; variants include lengthened or shortened phrases, and a series with similar pattern but entirely of harsh buzzes. Calls include short, strident, sputtering, rasping buzzes, e.g. "brzzk, brzzk", strung together as prolonged unmusical chattering and sometimes as an even rattle. Race *leucops* said to give short, quiet, simple, repetitive song (apparently different in tone from nominate) during which wings sometimes lifted over back; also, noisy churring or purring alarm, often repeated in rolling sequence, and short double alarm call.

Habitat. Open forest, edge, second growth, scrub, mossy forest; avoids intact forest. In tall bushes and thickets in hill forest edges, often around pines (*Pinus*); on high ridges, found in dense bushes in *Imperata* grassland, stunted trees, pines and old abandoned clearings, and scrub near villages. Hills and mountains, usually 800–2100 m, ranging down to 450 m in winter and sometimes ascending to 3500 m. In Borneo (race *leucops*), inhabits tall bushes, thickets and clearings in forested hills (900–3500 m); usually in canopy or borders of montane forest, including shrubby growth above tree-line.

Food and Feeding. Feeds on berries and invertebrates, apparently principally the latter. In Borneo (race *leucops*) eats mainly fruit, e.g. wild raspberries (*Rubus*), small figs (*Ficus*) and *Mallotus*. In singles, pairs or, more often, small groups; forms flocks of up to 30 individuals in winter. Usually forages at middle levels, but regularly from low bushes to high treetops; rarely or never descends to ground. Often shy and quiet, hidden inside bushes and trees, but may be demonstrative; raises crest feathers when excited. Bornean race usually seen singly or in pairs, and reported as venturing in mornings above tree-line on Mt Kinabalu, to feed on berries in alpine heathlands.

Breeding. Mar–Jul. Nest a shallow cup, neatly and firmly made, built in c. 6 days (in Myanmar), in NE India constructed with black fern roots, grass, twigs and tendrils of climbing plants, interwoven with cobwebs, sometimes with leaves, and lined internally with fine grass; placed 0–3 m up (usually at low end of this range) in fork, or between several upright twigs or stems, in bush or large clump of grass. Clutch 2–3 eggs in Indian Subcontinent; no information on incubation and nestling periods. Nests sometimes parasitized by Jacobin Cuckoo (*Clamator jacobinus*).

Movements. Resident; some downslope movement in cold season.

Status and Conservation. Not globally threatened. Locally abundant throughout much of its range; uncommon at edges of mainland range. Abundant in Myanmar in Chin Hills, Karen Hills and Southern Shan States, and the commonest bulbul above 1000 m in Bhamo district; common in N Thailand; rare in S China. Very few recent records from NE India, where it seems generally scarce in all accessible localities; described in older literature as locally common in hilly parts, such as Khasi Hills, N Cachar Hills, etc. Rare and local (probably only an irregular visitor) in Bangladesh, only one recent record (Sylhet); presumably occurs in Chittagong, but no specimens traced. Race *leucops* occurs in Mount Kinabalu National Park, and is locally common along N Bornean mountain range; first recorded in Kalimantan in 1993, at Gunung Lunjut, in Kayan Mentarang National Park. As this species occupies montane, non-forested habitats, it is considered to be at little risk.

Bibliography. Ali & Ripley (1996), van Balen (1997), van Balen & Nurwatha (1997), Cheng Tsohsin (1987), Cook (1912), Davidson (1998), Davison & Chew Yen Fook (1996), Deignan (1945), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Grimmett *et al.* (1998), Harington (1902, 1909a), Harvey (1990), Holmes (1997), Hopwood (1912), Hopwood & Mackenzie (1917), Hume (1888), Hume & Davison (1878), Jenkins *et al.* (1996), Kloss (1923), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), Meyer de Schauensee (1984), Oates (1895), Rasmussen & Anderton (2005), Riley (1938), Rippon (1896, 1901), Robson (1991b, 1993, 2000), Robson *et al.* (1993b), Sharpe (1888b), Smythies (1957, 1986, 1999), Stanford & Mayr (1940–1941), Stuart Baker (1892–1893, 1922–1930), Thewlis *et al.* (1996), Thompson *et al.* (1993), Ticehurst (1933), Tobias (1997c), Wickam (1918), Wickham (1929–1930), Zheng Guangmei & Zhang Cizu (2002).

38. White-browed Bulbul

Pycnonotus luteolus

French: Bulbul à sourcils blancs **German**: Weißbrauenbülbül **Spanish**: Bulbul Cejiblanco

Taxonomy. *Haematornis luteolus* Lesson, 1841, Mumbai, India.

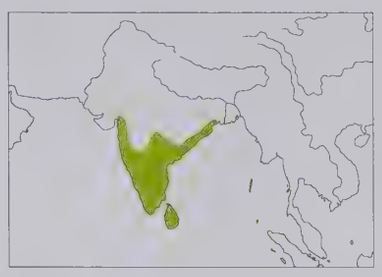
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. goiavier*; affinities to other members of genus remain to be clarified. Proposed race *flavirictus* (Tamil Nadu, in S India) considered indistinguishable from nominate. Two subspecies recognized.

Subspecies and Distribution.

P. l. luteolus (Lesson, 1841) – peninsular India (Gujarat, Madhya Pradesh and S West Bengal S to Tamil Nadu); possibly also in Dry Zone of Sri Lanka.

P. l. insulae Whistler & Kinnear, 1932 – Sri Lanka (with possible exception of Dry Zone).

Descriptive notes. 20 cm; 28–43 g. A dingy olive, unkempt, bulky, relatively inconspicuous bulbul with quite short, decurved bill. Nominate has grey-brown crown, whitish forehead, broad frosty white supercilium extending beyond eye, whitish subocular crescent, fine whitish to grey-brown streaks on ear-coverts, narrow dark eyestripe; usually 3–4 slender filoplumes protruding from nape (difficult to see in field); neck to uppertail-coverts olivaceous brown with dull greenish feather edges; wings and



tail similar, with brightest and palest fringing on remiges and rectrices; chin yellowish-white, throat whitish, thin blackish moustachial stripe, and short broad yellow submoustachial stripe; breast pale greyish-olive, merging into yellowish-white on belly, vent yellow; iris variable, usually with reddish tint (thus, dark brown, rusty, dull red or blood-red); bill blackish; legs greyish-black. Sexes alike. Juvenile is duller and browner (less olive-green tinge) above, lacks nuchal filoplumes, supercilium less distinct, ear-coverts unstreaked, fringes of wing feathers rustier, paler below, chin tinged yellow, iris duller. Race *insulae* is slightly smaller and darker than nominate. Voice. Heard more often than seen. Song a long, loud, ebullient, cacophonous flurry that starts with a few hard hesitant notes, then erupts into bubbling, spluttering, rapid chatter of paired staccato notes; shorter, slower versions also given. Song includes some mimicry of e.g. drongos (*Dicrurus*), leafbirds (*Chloropsis*) and others. Calls include song fragments, e.g. "wheek-wheek woo", the notes of emphatic sharp tone of song but well spaced; also a rasping "churr".

Habitat. Open and largely cultivated habitats. Occurs in dry woodland edge, second growth, scrub country and dense thorny thickets (fond of *Lantana* scrub and *Euphorbia* thickets), also gardens and hedges; in Sri Lanka often abundant in variety of man-modified habitats, including cinnamon plantations. Avoids intact forest and humid areas. Lowlands, to c.1300 m in India and to c.1000 m in Sri Lanka.

Food and Feeding. Bulk of diet comprises fruit and berries; small amount of invertebrates consumed, including spiders (Araneae) and a range of insects. Berries and other fruits seem to be more important than insects in nestling diet. Recorded as feeding on wide variety of plant types, including *Lantana*, *Ziziphus oenoplia*, *Mimusops*, *Streblus*, and various figs (e.g. *Ficus banghalensis*, *F. microcarpa*, *F. religiosa*, *F. infectoria*). In S India (Point Calimere, in Tamil Nadu), visited many fruiting trees and shrubs (*Pachygone*, *Tinospora*, *Capparis*, *Cretaeva*, *Flacourtia*, *Hugonia*, *Glycosmis*, *Toddalia*, *Ochna*, *Azadirachta*, *Walsura*, *Olax*, *Cansjera*, *Pleurostylia*, *Salacia*, *Scutia*, *Ziziphus*, *Cissus*, *Allophyllus*, *Lepisanthes*, *Lannea*, *Syzygium*, *Memecylon*, *Coccinia*, *Trichosanthes*, *Opuntia*, *Benkara*, *Canthium*, *Ixora*, *Pavetta*, *Manilkara*, *Diospyros*, *Jasminum*, *Azima*, *Salvadora*, *Carissa*, *Carmona*, *Cordia*, *Ehretia*, *Solanum*, *Premna*, *Cassytha*, *Viscum*, *Breynia*, *Drypetes*, *Phyllanthus*, *Securinegra*, *Asparagus*, *Phoenix*). Also visits flowers (e.g. *Lantana*, *Erythrina*, *Salmalia*) to feed on nectar; in some cases, whole flowers are eaten (e.g. *Tabernaemontana divaricata*, *Argyreia campanulata*). Noisy and restless, usually in pairs, but often skulking, keeping to dry, dense thickets, and rarely perching in open. Rarely descends to ground.

Breeding. Mainly Mar–Sept, but nests found in all months; usually Aug–Mar in S India (Tamil Nadu), but variable, depending on environmental factors and fruiting seasons; Dec–Jun, with most nests in Apr–May, in W Sri Lanka; multi-brooded. Nest an unlined, flimsy, almost oval structure (smaller and less cup-shaped than that of *P. cafer*) made of thin twigs, grass stems or rootlets, lined with fine grasses; in Tamil Nadu, dry hanging roots of the arboreal plant *Tinospora cordifolia* often used as nest material, grass very rarely used (unlike nests of "*P. cafer* complex"); placed usually less than 1·5 m up (sometimes to 4 m), attached by cobwebs or other material (e.g. wool) to fork in bush (e.g. *Lantana*) or small tree, preferentially in thorny bush (in Tamil Nadu most often *Xeromphis spinosa*, followed by *Gymnosporia emarginata*). Clutch 2 eggs, rarely 3–4; incubation period 11 days (Tamil Nadu); nestling period 9–11 days, usually 10 days. Of 114 eggs laid in Tamil Nadu, 13·2% survived to fledging; nest predators were snakes, mongooses (*Herpestes*), coucals (*Centropus*) and blue-magpies (*Cissa*).

Movements. Resident.

Status and Conservation. Not globally threatened. Abundant in much of peninsular India, occurring wherever there is vegetation; absent from humid areas, e.g. moist woods of Western Ghats. Abundant, and one of the commonest and most widely distributed bird species, in Sri Lanka. Preference for cleared areas and tolerance of man-modified environments suggest that this species does not face any threat. Important as an active seed-disperser for many plant species, e.g. in Tamil Nadu. Also performs role as a pollinating agent; conversely, sometimes consumes whole flowers, thereby preventing pollination.

Bibliography. Ali (1932, 1969), Ali & Ripley (1996), Ali & Whistler (1933), Balasubramanian (1996), Ball (1874, 1876, 1878), Barnes (1889), Betham (1897), Brown (1923), Butler, A.L. (1896), Butler, E.A. (1881), Dewar (1905), Dickinson *et al.* (2002b), Fairbank (1877), Ferguson & Bourdillon (1903–1904), Grimmett *et al.* (1998), Harrison (1999), Henry (1998a), Jones *et al.* (1998), Lainer (1999), Law (1936b), Legge (1983), Lewis (1898), Neelakantan (1954), Rasmussen & Anderton (2005), Ripley (1982), Ripley *et al.* (1988), Saha & Dasgupta (1992), Santharam (1997), Siromoney (1963), Vijayan (1980), Whistler & Kinnear (1932), Zacharias & Gaston (1993, 1999).

39. Yellow-vented Bulbul

Pycnonotus goiavier

French: Bulbul goiavier **German**: Augenstreifbülbül **Spanish**: Bulbul Culiamarillo

Taxonomy. *Muscicapa* (*Goiavier*) Scopoli, 1786, Manila, Luzon, Philippines.

Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species forms a superspecies with *P. luteolus*; affinities to other members of genus remain to be clarified. Proposed race *personatus* (Sumatra) considered indistinguishable from *analis*; similarly, *karimuniensis* (Karimunjawa I, N of Java) merged with *gourdini*. Six subspecies provisionally recognized.

Subspecies and Distribution.

P. g. jambu Deignan, 1955 – S Myanmar (Tenasserim S from 12·5° N), C & S Thailand, C Laos, S Cambodia and S Vietnam.

P. g. analis (Horsfield, 1821) – Peninsular Malaysia, Sumatra (including Riau and Lingga Archipelagos, Bangka, Belitung), Java (including Kangean Is), Bali, Lombok and Sumbawa.

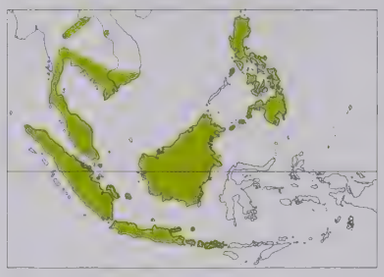
P. g. gourdini G. R. Gray, 1847 – Borneo (including Maratua I, off E coast) and Karimunjawa I (N of Java).

P. g. goiavier (Scopoli, 1786) – N & C Philippines from Luzon, Polillo Is and Mindoro S, including most smaller islands, to Panay, Guimaras, Negros and Masbate.

P. g. samarensis Rand & Rabor, 1960 – C Philippines (Ticao, Samar, Biliran, Buad, Cebu, Olango, Camotes, Leyte, Bohol).

P. g. suluensis Mearns, 1909 – S Philippines, from Dinagat, Nipa and Camiguin Sur S to Mindanao (including several offshire islets), Basilan and Sulu Archipelago (East Bolod and West Bolod S to Sanga Sanga and Bongao).

Introduced in S Sulawesi around Ujung Pandang (*analis*) and, recently, on Buton I (presumed same race).



Descriptive notes. 19–20·5 cm; 24–37 g. Medium-sized, noisy, conspicuous bulbul with stubby, erectile crest. Nominate race has broad supercilium, crown side, cheeks and throat white, contrasting with dark brown forehead, ear-coverts and coronal stripe (including crest), and blackish loral stripe and ring around eye; neck to back mid-brown with olive-brown fringing, rump and uppertail-coverts olive-brown; upperwings brown, outer webs of primary coverts and flight-feathers edged ashy brown; tail warm dark olive-brown with narrow ash-brown fringing, broader at tip; breast and belly whitish with vague brownish streaking, central belly white, vent and undertail-coverts yellow; iris brown to bright reddish-brown; bill blackish; legs very dark greyish-black. Sexes alike. Juvenile has grey, indistinct supercilium, paler and browner crown, duskier lores and face, warmer brown upperparts and wing-feather fringes, pale grey and lacking obvious streaking below, undertail-coverts paler and duller, bill paler and browner. Race *jambu* has upperparts warmer, more ferruginous, than nominate, underparts sullied slightly browner, ear-coverts whitish, vent and undertail-coverts deeper yellow; *analis* is duller and paler above, with paler abdomen, duller yellow vent; *gourdini* has supercilium off-white (clouded with brown), less fringing on upperparts (more uniform), darker flanks, heavier squamations on breast; *samarensis* is slightly smaller than nominate, with heavier streaks on breast, darker flanks, more blackish crown and ear-coverts; *suluensis* is smaller, with slightly paler crown, distinctly paler ear-coverts. Voice. Song a choppy musical stream of notes, varied and difficult to transcribe. Dawn song relatively simple, e.g. gurgling "trikutruk-trikutruk-trikutruk", jauntier "trikutrik trikutrik trikutrik" ("trik" syllables stressed), "troik-troik-troik-troik" (in flight), jaunty "tidli'tidlu-tidli'tidlu-tidli'tidlu" ("tid" syllables stressed), also stuttering jumble of "trik" and "troik" notes, e.g. "ke-ke-ke-trik ke-ke-troik", speeding up into bubbling call with random extra notes added; day song tends to be longer, quicker, more bubbling, e.g. "key-diddle-diddle-do, key-diddle-diddle-do", "trik-trikatrottle trik-trikatrottle trik-trikatrottle trik-trikatrottle (-trik)", "rellibo-rellibo-rellibo-rellibo, rellibo-rih", or "chook chook trroiku-trroiku-trroiku-trroiku". Pair-members sometimes duet, one giving bubbling song, the other joining in with string of emphatic "treek" notes. Calls with bubbling "chic-chic-chic", and sharp "chwich-chwich", also bubbling "tiddloo-tiddloo-tiddloo" or "tid-liu, tid-liu, tid-liu"; partners often call together, raising wings above back as they do so. Alarm often a sharp, usually 3-note "chiop chop-chop" (e.g. at presence of intruder near nest or fledglings), and common flight call a similar but single, less intense "chep"; fledglings beg with slurred "chio-uck". Voice generally similar to that of *P. cafer*.

Habitat. Coastal scrub, pioneer sea-dune scrub, semi-open banks and shoals of large rivers, scattered bushes and reedbeds, degraded mangroves, second growth, orchards, young plantations (e.g. *Hevea*, *Acacia*, *Pinus*), parks, gardens, cultivation, roadsides, and often in very open situations with only few scattered bushes. Ranges far into suburbia, lives in close proximity with humans. Usually enters forest only where heavily degraded, and then typically only along logging tracks or at old timber-loading sites, but on Deli I and Tinjil I (W Java) occurs only in canopy of mature forest; colonizes new gaps in forest, such as golf courses, very rapidly. The only bulbul in Sundas adapted to oil palm (*Elaeis guineensis*) plantations. Mostly in lowlands; reported at c. 1500 m in Borneo (Mt Kinabalu) and S Philippines (Mt Malindang, on Mindanao), and to 2030 m in Peninsular Malaysia.

Food and Feeding. An opportunist and generalist, with very broad foraging niche. Diet primarily fruits, also seeds and nectar; also large quantities of invertebrates. Wide range of berries, other fruits and seeds, both native and introduced, taken. Fruit eaten includes figs (*Ficus benjamina*, *F. microcarpa*, *F. retusa*, *F. sagittata* and *F. trichocarpa*; fig diameters up to 15·5 mm), *Campnospermum auriculatum*, *Fagraea fragrans*, *Muntingia calabura*, *Glochidion*, *Macaranga*, *Vitex pubescens*, *Melastoma malabathricum*, *Ehretia microphylla*, *Cordia cylindristachya*, *Scaevola sericea*, *Clerodendron*, *Capsicum frutescens*, *Lantana*, *Roystonea regia*, *Passiflora foetida* and *Tetracera indica*; seen to eat ripe *Ptychosperma macarthurii* palm nuts, picked while hanging below inflorescence and swallowed directly; eats ripe flesh of large fruit, e.g. *Artocarpus heterophyllus*, *Carica papaya*, *Eugenia jambos*, *Nephelium lappaceum*, *Musa paradisiaca*, *Psidium guayava*; pecks flesh of ripe mangoes (*Mangifera indica*) while clinging to branches alongside. Noted as eating fleshy arils of *Acacia mangium* and *A. auriculiformis* seeds, arillate seeds of *Dillenia suffruticosa* and *D. excelsa*, and swollen pedicel of cashew (*Anacardium*) seed. Visits flowers to drink nectar, including at blossoms of four-angle bean (*Psophocarpus tetrogonolobus*), *Hibiscus* and *Malvaviscus*; usually functions as pollinator, but sometimes robs *Malvavicus* nectar by piercing corolla base. Invertebrates taken include lepidopterans, termites (Isoptera), ants (Hymentoptera), flies (Diptera), scarab beetles (Scarabaeidae), orthopterans (crickets, grasshoppers), worms; carrion sometimes eaten. Animal food identified as delivered to nestlings included termites, flying ants, orthopterans, mantids, beetles, caterpillars, adult and larval moths and butterflies, intermixed with various seeds (even rice). Harder items (e.g. beetles with tough carapaces) struck vigorously and repeatedly against a branch before being swallowed. Known to eat carrion; one ate dead snails flattened on a road, another removed and ate tail of a dead gecko and attempted to detach a leg. Visits birdtables to take food scraps. Usually encountered singly, in pairs or in parties of up to ten individuals, last-mentioned presumed to be mobile non-breeders. Normally forages fairly low, usually at 0–4 m; often joins congregations of frugivores at fruiting trees, occasionally feeding up to 50 m above ground. Performs aerial-sallies to catch flying insects, darting from exposed perches (including vertically into overhead swarm, somersaulting and gliding back with its capture), and jumping up at them from ground. Also searches foliage and bark (including by peering beneath large leaves) for larvae and other items, and probes bark crevices while clinging to vertical support. Regularly hops about on ground to feed on invertebrates; also picks at squashed or rotting fruit. On one small island, noted as visiting white-sand beaches daily to forage on small flies.

Breeding. Dec–Oct; nests found in all months in tropical regions; multi-brooded. Nest a deep cup, typically of dry grass stems and blades, tendrils, creeper stems and other fibres, enclosed in bamboo and other leaves, leaf skeletons, fern-frond fragments, small twigs, etc., occasionally incorporating small scraps of waste (e.g. paper, some silk), and neatly lined with plant fibres; outside diameter c. 12 cm, depth c. 10 cm, cup 5·6 cm across and 5 cm deep; placed 0·75–3 m above ground, usually in bush or sapling, sometimes in creeper or grass tussock, often in fork in small garden bush, hedge, exotic conifer, palm-frond axil, bamboo twig axil, trailing creeper or scrambling fern, among other sites; often breeds opportunistically in household pot-plants (including in hanging flowerpot), and other man-modified situations (balcony, verandah, etc.); nest sometimes used twice in same season, sometimes three times in succession. Clutch 2–4 eggs, usually 2, laid on consecutive days; incubation, solely by female, starting from second egg (but in one case the two eggs of a clutch hatched one week apart), incubation period 12–13 days; both pair-members tend chicks, both carry away faecal sacs, nestling period 10–14 days, mainly 12 days, rarely 10; fledglings cared for by both sexes, feed independently by fourth day, but tended by adults for up to 1 month.

Movements. Resident, subject to some dispersive movements. Non-breeding aggregations form, including large communal roosts (often of several hundreds and possibly thousands of individuals) at traditional locations in reedbeds, scrub and low woodland; some nomadic use of different roosting sites reported.

Status and Conservation. Not globally threatened. Common in SE Asia; first recorded in C Laos, along R Mekong, in 1966. Common in Java, able to tolerate fairly heavy trapping pressure for cagebird trade; common in Sumatra; abundant in lowland and mid-altitude Borneo, and common in cleared lowlands of Philippines. Pre-adapted in a number of ways to have exploited deforestation, and its populations must have exploded in recent centuries; the only bulbul in Sundas adapted to oil palm (*Elaeis guineensis*) plantations, numbers in interior of which rose after introduction of the pollinating weevil *Elaiedobius kamerunicus*. As it is favoured by deforestation and lives commensally with man, it is currently increasing.

Bibliography. van Balgooy (1979), Baltzer (1997), Brooks & Dutson (1997), Chasen & Hoogerwerf (1941), Coates & Bishop (1997), Danielsen & Heegaard (1995), Davison (1997b), Dickinson & Dekker (2002b), Dickinson, Dekker *et al.* (2002b), Dickinson, Kennedy & Parkes (1991), Duckett (1985), Duckworth, Salter & Khounboline (1999), Duckworth, Wilkinson *et al.* (1996), duPont (1971), Edgar (1933), Escott & Holmes (1980), Frith (1981a), Gibson-Hill (1949), Gilliard (1950), Goodman & Gonzales (1990), Grantham (2000), Halliday (1999), Herbert (1923–1926), Holmes & van Balen (1996), Hoogerwerf (1963a), Hoogerwerf & Siccama (1937–1938), Hopwood (1919), Hume (1873b), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lambert (1987), Lekagul & Round (1991), Lever (1987), MacKinnon (1988), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), McClure (1961, 1964), Medway & Wells (1976), Mees (1986, 1996), Ogilvie-Grant & Whitehead (1898), Purseglove (1957), Rabor (1977), Ramachandran (1982), Rand & Rabor (1960), Rensch (1931), Riley (1938), Ripley & Rabor (1958), Robson (1994, 1996b, 1996c, 2000), Smythies (1957, 1986, 1999), Ward (1969), Wells (1990a, 2005), White & Bruce (1986).

40. Olive-winged Bulbul

Pycnonotus plumosus

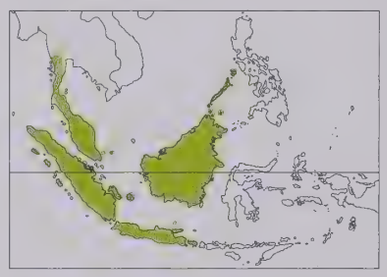
French: Bulbul aux ailes olive **German**: Malaienbülbül **Spanish**: Bulbul Aliverde
Other common names: Olive-brown/Large Olive Bulbul

Taxonomy. *P[ycnonotus]. plumosus* Blyth, 1845, Singapore.

Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. Present species previously included in genus *Brachypus*, which possibly merits resurrection; further study required to clarify relationships. Race name *insularis* previously considered invalid (and replaced by new name *hachisukae*), as preoccupied by a race of *Andropadus importunus* (formerly included in expanded present genus). Races *porphyreus*, *hutzi* and *insularis* only dubiously separable; full review required in order to assess their validity. Other described races are *chiroplethis* (Anamba Is), *billitonis* (Belitung) and *sibergi* (Bawean I) all barely distinguishable from nominate, and treated as synonyms of it. Five subspecies provisionally recognized.

Subspecies and Distribution.

P. p. plumosus Blyth, 1845 – S Myanmar (Tenasserim S from 12·5° N), S Thailand, Peninsular Malaysia (including Tinggi I), Singapore, E Sumatra (including Bangka and other associated islands), Java (including Bawean I), Bali and W & S Borneo (including Anamba Is).
P. p. porphyreus Oberholser, 1912 – W Sumatra and islands.
P. p. cinereifrons (Tweeddale, 1878) – W Philippines (Busuanga, Culion, Palawan).
P. p. insularis Chasen & Kloss, 1929 – N Borneo islands and SW Philippines (Cagayan Sulu).
P. p. hutzi Stresemann, 1938 – N & E Borneo.



Descriptive notes. 20–20·5 cm; 24–36 g. Relatively dainty, small-headed, unassuming bulbul. Nominate race has dark brown lores and eyering, grey face, olive-brown ear-coverts with white shaft lines that start below eye; cap dark olive-brown with faintly paler and greyer fringes (distinctly squamate impression in good light); upperparts to uppertail-coverts dark olive-brown, strongly tinged greenish, rump slightly warmer brown; upperwing olive-brown, primaries and secondaries darker, with brighter yellowish-green edging; tail dark olive-green with deep brown shafts and brighter yellowish-green edging; chin and throat whitish with faint greyish-brown tinge; breast olive-brown, faintly infused with ochraceous yellow (faded when worn, giving breast a greyish cast); flanks as breast but darker and browner, belly as throat but with tawny tinge, undertail-coverts light olive-brown with yellowish-buff margins; iris brownish-orange, red or dark red (age-related); bill blackish-brown to dark grey-brown; legs reddish-brown, variably paler to darker. Distinguished from similar *P. blanfordi* by less pronounced whitish streaks on ear-coverts, slightly darker olive wash on chest, yellowish-green (rather than ashy brown) flight-feather edging, dark eye. Sexes alike, male on average slightly larger than female. Juvenile is browner overall, particularly on throat and vent (yellow tones lacking), with less obvious whitish streaks on face, duller flight-feather fringes, browner eyes, also lacks dark patterning on undertail-coverts. Race *porphyreus* has iris orange, yellow or creamy-white (brown in immature); *cinereifrons* has pale greyish fringes and centres on forehead feathers, pale greyish breast, pale greyish-white belly, olivaceous-buff undertail-coverts, duller fringes of remiges and rectrices; *insularis* is very similar to nominate, but slightly larger (although measurements overlap); *hutzi* has slightly darker (less olive) upperparts, slightly greyer (less yellowish) underparts. Voice. Song soft and chirping, with liquid, fruity quality, similar to that of *P. finlaysoni*; common song phrases, among almost infinite variations, transcribed as "quick doc-tor quick", slightly longer and more stressed "quick doc tor quíck doc", or with stuttered components, e.g. "qu-quick doc tor quíck d-doc", "pee-kwod, kapichu-peeku, pee-kwod" or "whip wi-wiu wu-wurri'i"; in Philippines, as "chop wit chu do-de-do-de-du". Calls include throaty "whip-whip" and purring "wrrh wrrh wrrh".

Habitat. Very broad range of habitats, from forest edge and second growth to coastal scrub and mangroves. Scrubby landward fringe of mangrove forest, degraded strand woodland and coastal scrub generally, including paperbark (*Melaleuca*) stands and screw-palm (*Pandanus*) thickets; pioneer/gap-phase trackside and riverside secondary growth at edge of lowland evergreen forest and peatswamp-forest, and where forest heavily degraded; mixed orchard, e.g. under coconut plantings; abandoned rubber (*Hevea*) and other tree plantations, e.g. of teak, pine (*Pinus*) and *Araucaria*, reverting to secondary forest; secluded thickets in parkland. Not normally in parks or gardens, but will venture far out into scrubby grassland. Usually in lowlands, but on slopes to c. 500 m, rarely to 800 m, in parts of Peninsular Malaysia.

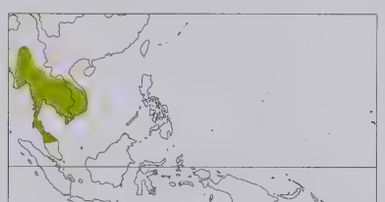
Food and Feeding. Generalist, consuming berries, other fruits, invertebrates. Diverse diet includes figs (*Ficus microcarpa*, *F. trichocarpa*), small fruit of *Gynotroches axillaris* and *Campnospermum auriculatum* (Anacardiaceae), and the aril of *Acacia mangium* seeds; also *Dillenia excelsa*, *D. suffruticosa*. Consumes various arthropods, including beetles (Coleoptera) and orthopterans, and even freshwater crabs. Usually seen singly or in pairs, sometimes in small family parties; usually low down. Often joins other bulbuls at fruiting trees.
Breeding. Jan–Sept; almost through year in tropical localities. Record of three apparent adults (one brooding, flanked by two perched) at one nest suggested presence of helper, but proof of co-operative breeding lacking. Nest, sometimes built by two adults, is a deep, open cup, with external diameter c. 7 cm, loosely constructed from dead leaves and fine creeper stems, often decorated on outside with bamboo leaves, lined with fine fibres and a little grass, placed 1·5–13 m above ground (mostly towards lower end of range) usually in a bush or sapling, commonly in the shrub layer of abandoned rubber plantations, once in an *Araucaria* plantation; reported sites include hollowed top of Nipa (*Nypa*) palm frond stub, stemless forest-edge bertam palm (*Eugeissona tristis*), deep in clump of screw-palm, in scrambling resam ferns, in fork in low rhododendron (*Melastoma malabathricum*), in fork of rubber tree. Clutch 2 eggs; no information available on incubation and fledging periods; fledged broods of one and two young recorded, fledglings tended at least sometimes by two adults.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally abundant throughout much of range. Ability to tolerate broad range of degraded and man-modified habitats suggests that this species is not likely to face any future risk of extinction.
Bibliography. Bartlett (1895), Berwick (1952), Büttikofer (1887), Chasen (1935), Corlett & Lucas (1989), Danielsen & Heegaard (1995), Davison (1987), Davison & Chew Yen Fook (1996), Dickinson, Dekker *et al.* (2002b), Dickinson, Kennedy & Parkes (1991), Duckworth & Kelsh (1998), duPont (1971), Dymond (1994), Edgar (1933), Fogden (1972), Ford & Davison (1995), Gibson-Hill (1949), Harrisson (1964), Holmes (1994), Hoogerwerf (1965), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Kemp (2000), Kennedy *et al.* (2000), Lambert (1989b), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993), Madoc (1976), Mann (1991), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), Oberholser (1917b), Peh & Ling Ong (2002), Riley (1938), Robson (2000), Smythies (1957, 1986, 1999), Tilford (2000), Vowles & Vowles (1997), Wells (1990a, 1990b, 2005).

41. Streak-eared Bulbul

Pycnonotus blanfordi

French: Bulbul de Blanford **German**: Blanfordbülbül **Spanish**: Bulbul de Blanford
Other common names: Blanford's (Olive) Bulbul

Taxonomy. *Pycnonotus blanfordi* Jerdon, 1862, Thayetmyo, south Myanmar.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species may warrant placement in a separate genus, alongside some other bulbuls of SE Asia and Sundaic region. Proposed race *robinsoni* (Malay Peninsula) is indistinguishable from, and merged with *conradi*. Birds reported from N & C Laos not subspecifically identified. Two subspecies recognized.
Subspecies and Distribution.
P. b. blanfordi Jerdon, 1862 – W, C, E and S Myanmar (apparently including Arakan).
P. b. conradi (Finsch, 1873) – Thailand, N & C Peninsular Malaysia (N Kedah, Kelantan), S Laos, Cambodia, C & S Vietnam (in C & S Annam, Cochinchina).
Also (subspecies undetermined) N & C Laos.



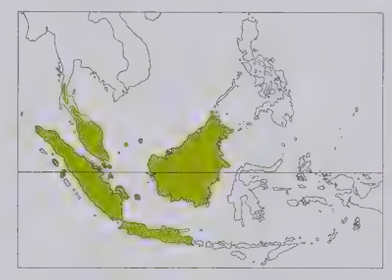
Descriptive notes. 17·5–20 cm; 28–36 g. Medium-sized, nondescript, brownish bulbul. Nominate has dark brown lores, dull white lower face washed greyish-brown; ear-coverts and area below eye pale brown with prominent white shaft streaks; cap and upperparts to rump dull earth-brown, crown feathers slightly lengthened and with darker brown centres, uppertail-coverts slightly lighter, pale creamy; upperwings as mantle; primary coverts and flight-feathers slightly darker brown, outer webs fringed olive-brown; tail olive-brown with greenish tinge; chin and upper throat whitish, merging into greyish on lower throat, and light brownish-grey on breast and upper flanks; middle belly to undertail-coverts uniform pale tawny buff; iris pale grey in male (female possibly greyish-brown), eyelids plumbeous; bill blackish-brown, sometimes pale pinkish-grey base of lower mandible; legs slaty brown, claws blackish. Best distinguished from confusingly similar *P. plumosus* by voice, iris colour, lack of greenish edging of flight-feathers, pale creamy undertail-coverts. Sexes alike. Juvenile has iris light greyish-brown, bill horny brown, feet and toes plumbeous, claws pinkish. Race *conradi* has distinctly yellowish-tinged vent, and underparts often yellower than in nominate. Voice. Harsh "chu-chu-chu" or rasping "which-which-which" when foraging, and sometimes in flight. Also more piping "brink-brink-brink"; voice lacks the rich, fruity quality of *P. plumosus* and *P. finlaysoni* song.
Habitat. Scrub (inland and coastal), bamboo, open mixed deciduous woodland, semi-desert, cultivation, parkland, gardens, urban areas, tracksides and clearings. Favoured habitats overlap with those of *P. plumosus*, but occurs in rather more open sites. Lowlands to 900 m.
Food and Feeding. Diet fairly broad, includes both fruit and insects. Fledglings fed with berries and many insects, including termites (Isoptera), caterpillars and orthopterans. Most often encountered singly, in pairs, or in family-sized parties, but record of group of up to twelve individuals aerial-foraging. Usually arboreal; also forages aerially and in sallies from perches. Also drops to the ground to catch insects; apparently lifts or flips leaves and small stones to seek items underneath.
Breeding. Recorded Mar–Sept in Myanmar, Mar–Jul in N Thailand and Jan–Sept in S, and Feb–Jul in Peninsular Malaysia; multi-brooded. Nest construction in one case took 4 days; nest relatively small and flimsy, a firm but loosely constructed open cup made from small twigs, leaf stalks, grass and fibres (e.g. coconut fibres), with plenty of spider webs attached to outside; often placed less than 2 m above ground, sometimes up to 5 m, in branch fork of bush or small tree (e.g. *Croton*, *Ziziphus jujuba*), or lodged in creeper, insecurely attached and prone to dislodgement in high winds. Clutch 2–3 eggs; incubation mostly by female, male at least sometimes incubates for short stints, period (from laying of last egg) 11–12 days; hatching often asynchronous, but eggs laid on successive days hatched together; nestlings tended by both sexes, both remove faecal sacs, also observed to swallow faeces of well-developed chicks, nestling period 10 days; fledged broods of 1–3 observed. Chicks often preyed on by crows (Corvidae) in Thailand.
Movements. Resident.
Status and Conservation. Not globally threatened. Common to abundant in N & C Thailand and S Laos. The commonest lowland bulbul in much of Myanmar; common throughout valleys of R Irrawaddy and R Sittang, often occurring in built-up areas and around major cities (e.g. Shwebo, Mandalay, Yangon etc.). Given this species' propensity to live at high densities in highly man-modified environments, it is unlikely to to be at any immediate risk.
Bibliography. Daltry & Momberg (2000), Deignan (1940a, 1945), Delacour & Jabouille (1931), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Frith (1981a, 1981b), Gibson-Hill (1949), Harington (1909b), Herbert (1923–1926), Hopwood (1912), Hume (1875), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), Macdonald (1906), Madoc (1950, 1976), Mears & Oates (1907), Medway & Wells (1976), Riley (1938), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993b), Smythies (1986), Stanford (1935), Strange (2002), Thewlis *et al.* (1996), Ticehurst (1932, 1933), Wells (2005).

42. Cream-vented Bulbul

Pycnonotus simplex

French: Bulbul aux yeux blancs **German**: Weißaugenbülbül **Spanish**: Bulbul Ojiblanco
Other common names: White-eyed (Brown) Bulbul

Taxonomy. *Picnonotus* [*sic*] *simplex* Lesson, 1839, Sumatra.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species may warrant placement in a separate genus, alongside some other bulbuls of SE Asia and Sundaic region. Wide individual variation found throughout range. Race *halizonus* barely distinguishable, and may not be valid; described race *axanthizus* (Natuna Is) synonymized with that taxon. In addition, proposed races *chloeoides* (NW Sumatra), *perplexus* (N Borneo) and *oblitus* (Bangka, Belitung and W Borneo) all poorly differentiated, or described on basis of eye-colour morphs; treated as junior synonyms of nominate. Three subspecies recognized.
Subspecies and Distribution.
P. s. simplex Lesson, 1839 – S Thailand and Peninsular Malaysia S, including Riau and Lingga Archipelagos, to Sumatra (including Bangka, Batu, Belitung, Nias I), and Borneo (including Balambangan I).
P. s. prillwitzi Hartert, 1902 – Java.
P. s. halizonus Oberholser, 1917 – Anambas Is and Natuna Is.



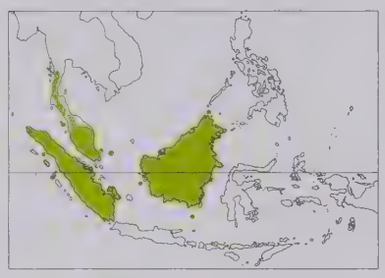
Descriptive notes. 18 cm. Medium-small, nondescript, noisy, conspicuous bulbul. Nominate race has head (except throat) and upperparts uniform dark warm olive-brown, upperwings with brighter fringing on secondaries; tail dark olive-brown with slight rufous tinge, darker than uppertail-coverts; chin and throat whitish with slight creamy tinge; breast pale brown with cream feather fringing, shading browner at side and on flanks; belly to undertail-coverts pale creamy white with slight yellow tinge, palest on tail-coverts, slight greyish-brown wash on breast and flanks; iris strikingly white or yellowish-white, but in Borneo and some Sumatran satellite islands most have red iris; bill black; legs brown. Distinguished from similar *P. brunneus* and *P. erythropthalmos* by colder brown upperparts, somewhat cleaner, creamy-whitish underparts. Sexes alike. Juvenile has crown, upperparts and wing-feather fringes warmer brown; iris grey-brown, slowly changing to pale orange or warm brown, then pale yellowish to white, bill dark horn-brown, feet brownish-pink. Race *prillwitzi* has lighter upperparts, yellower underparts; *halizonus* is virtually identical to nominate, but supposedly has fractionally longer and heavier bill. Voice. Short, emphatic song phrases, "quik chop" and "quik-plik chop", and slightly longer "beequik, pee dee kew"; harsh and repetitive call notes; also subdued quavering "whi-whi-whi-whi-whi", interspersed with low "pru-pru, prrr" and "prr-pru".
Habitat. Broadleaf evergreen forest (mature and disturbed), edges, secondary growth, peatswamp-forest, and heath-forest; one of very few bird species regular in the extreme *Baeckia/Gluta* heath-scrub of the Gunung Keriong plateau, in Peninsular Malaysia. In standardized mist-netting efforts in Negeri Sembilan (Peninsular Malaysia), more than twice as many individuals trapped in 25-year-old regenerating forest as in nearby mature forest, but only 16 % retrapped in regenerating growth (compared with 36 % in mature growth), implying different usage of habitat. From lowlands to 1300 m.
Food and Feeding. Fruit; also insects, including cockroaches (Blattodea) and caterpillars. Regularly forages on mass-produced small fruit (e.g. *Fagraea fragrans*) or figs, including banyans (*Ficus microcarpa*, *F. sumatrana*), and 11 of 25 *Ficus* species (mean minimum fruit-diameter in range 5·4–15·5 mm) in study at Kerau, in Peninsular Malaysia. Recorded as feeding on fruit of *Callicarpa* and *Gmelina* in Borneo. Usually encountered singly or in pairs; several individuals may converge at a fruit source, but no evidence that larger groups formed. Gathers at fruiting trees and shrubs with other bulbuls. Regularly joins mixed-species foraging flocks of insectivores. Usually seen in lower and middle storeys along forest trails, especially in more open areas, but also ascends to canopy.
Breeding. Feb–Oct. Builds cup-shaped nest, using small twigs, creeper tendrils and rootlets; one individual in Borneo gathered cobweb into a ball and flew off with it, suggesting that cobweb sometimes used as binding for outer layers of nest; usually in thick undergrowth, either in upright fork or attached to vertical stems. Clutch 2 eggs; no information available on incubation and nestling periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common or very common across much of range. Has presumably suffered rapid decline in lowland Sumatra and Java, where forest has been cleared at an astonishing rate over recent decades. Because this species requires fairly well-developed forested habitats, it is more at risk than are many open-country bulbuls: its use of foothill and submontane heath-like habitats, however, suggests that it is unlikely to become seriously threatened.
Bibliography. Chasen & Kloss (1929), Danielsen & Heegaard (1995), Davison (1987), Deignan (1954), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Dymond (1994), Fogden M.P.L. (1966), Ford & Davison (1995), Gibson-Hill (1949, 1950), Gregory-Smith (1997a), Holmes (1994, 1996), Hoogerwerf (1966), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Kidd (1978), Lambert (1989b), Lekagul & Round (1991), Lim Boo Liat (1965), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Mayr (1938), McClure (1966), Medway & Wells (1976), Mees (1986), Oberholser (1912, 1932), Peh & Ling Ong (2002), Rajathurai (1996), Riley (1938), Robson (2000), Smythies (1957, 1999), Vowles & Vowles (1997), Wells (1976, 1990a, 1990b, 2005).

43. Asian Red-eyed Bulbul

Pycnonotus brunneus

French: Bulbul aux yeux rouges **German**: Rotaugenbülbül **Spanish**: Bulbul Ojirrojo
Other common names: Red-eyed (Brown) Bulbul, Brown Bulbul

Taxonomy. [*Pycnonotus*] *brunneus* Blyth, 1845, Melaka, Peninsular Malaysia.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species probably warrants placement with *P. erythropthalmos* in a separate genus; both appear rather distantly related to the "*P. capensis* complex" and "*P. cafer* complex". Race *zapolius* hardly distinguishable, and perhaps unworthy of taxonomic recognition; form on Tioman I (off E Peninsular Malaysia) previously misidentified as belonging to this race. Described race *zaphaeus* (from Pulau Matasiri, off SE Borneo) indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
P. b. brunneus Blyth, 1845 – S Myanmar (Tenasserim S of c. 12·5° N), extreme S Thailand, Peninsular Malaysia (including Tioman I), Sumatra (including Banyak, Nias, Batu, probably also Bangka I) and Borneo (including Banggi, Karimata and Larot).
P. b. zapolius Oberholser, 1917 – Anamba Is.



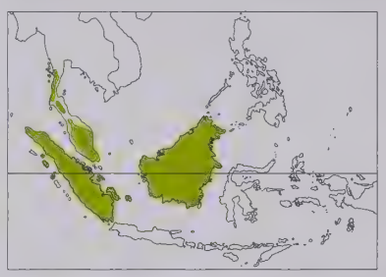
Descriptive notes. 19 cm; 24–37 g. A nondescript bulbul, almost uniformly brown in colour. Nominate has head (except throat) and upperparts warm olive-brown, upperwing with faint lighter and brighter olive fringing on secondaries; flash of tawny underwing usually exposed at carpal joint; tail dark olive brown, outer webs of feathers with dull olive-green fringes (chiefly at bases); chin and throat whitish with distinct tawny tinge; breast to upper belly ashy brown, feathers edged pale buff, shading richer brown at side and on flanks; lower belly as breast but more uniform and paler, undertail-coverts dull tawny-yellow with pale brown shaft marks; iris red, sometimes cream-coloured; bill dark brown to dark reddish-brown, distinctly darker on upper mandible; legs brown or reddish-brown, variably darker or paler. Distinguished from very similar *P. erythropthalmos* mainly by lack of bright eyering, brighter (less grey) crown and mantle, no rufous tinge on rump, browner (less grey) breast. Sexes alike, male on average slightly larger than female. Juvenile has upperparts and wings slightly paler, warmer brown; iris light grey or brownish-grey, later dull orange, bill blackish-horn; legs pinkish-brown. Race *zapolius* is slightly larger than nominate (but extensive overlap), with slightly darker and more greenish upperparts. Voice. Series of high-pitched bubbling notes, the last ones rising sharply, "pri-pri-pri-pri-pri-pit-pit"; also brief trills, twitters, and short strident "chirrup" or "whit-it!".
Habitat. Broadleaf evergreen forest and peatswamp-forest (mature and disturbed), particularly at edges and in secondary growth, often venturing into adjacent scrub; one record from mangrove forest (Langkawi I, off W Peninsular Malaysia). Often occurs in riverside and trackside growth, and occasionally in mature tree plantations, e.g. rubber (*Hevea*), near forest. In standardized mist-netting efforts in Negeri Sembilan (Peninsular Malaysia), 14 individuals trapped in 20-year-old regenerating forest, compared with only one in mature forest. Plains level and slopes generally to c. 450 m, locally higher, to at least 1000 m, even into patches of low *Baeckia* heath-forest in highlands of Peninsular Malaysia.
Food and Feeding. Fruit, including berries, and seeds; also invertebrates. One adult seen to carry a lizard's tail, perhaps for nestlings. Fruit taken includes many figs (*Ficus*), e.g. banyans (*Ficus microcarpa*), *F. sumatrana*, and more than half (in mean minimum fruit-diameter range 5·4–27·4 mm) of 25 *Ficus* species in study at Kerau, in Peninsular Malaysia. Noted as feeding on berries and seeds of *Eurya acuminate*, *Acacia mangium*, *Dillenia suffruticosa*, *Pipturus*, *Licuala paludosa* (a palm), *Macaranga triloba*, *Trema tomentosa*, *Callicarpa albida*, *Gmelina*, and the melastome *Dissochaeta pallida*. Invertebrates in diet include grasshoppers (Orthoptera) and caterpillars; also many other insects, occasionally caught in flight during brief sallies. One individual in Sumatra had eaten a spider (Araneae). Observed as singles, pairs and small family parties; up to five may converge independently on a fruit source, but not known to form groups. At least occasionally joins mixed-species foraging flocks; of 135 individuals encountered at Gombak, in Peninsular Malaysia, 29 (21%) were in mixed-species flocks. Often forages together with *P. atriceps*, *P. erythropthalmos*, *Iole olivacea*, and leafbirds (*Chloropsis*). Forages mostly in lower and middle storeys; less often in canopy.
Breeding. Feb–Oct. Nest a deep open cup, external dimensions 10 cm across and 6·5 cm deep, cup diameter 7 cm and depth 3·6 cm, made of broad leaves, leaf stalks and midribs enclosing layer of dried strips of grass blade, threshed rice heads and some kapok cotton, the cup itself lined with layer of springy black fibres likely (but not confirmed) to have been horsehair fungal hyphae; placed 0·5–5 m up in variety of sites, e.g. leaflet axil of a ginger (Zingiberaceae) in scrub, dense crown of bush in grass-filled clearing or on forested reservoir bank, and tree-crown foliage; one nest on Borneo was 2 m up on jagged top of broken-off sapling. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally fairly common throughout range. Tolerant of fairly severe habitat disturbance, and unlikely to be at risk. Nevertheless, total numbers must have declined in recent decades because so much forest has been lost in lowlands of Sundaic region. Occurs in several protected areas, including Taman Negara National Park, in Peninsular Malaysia, and Bukit Barisan Selatan and Way Kambas National Parks, in Sumatra.
Bibliography. Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), Davison (1987, 1997b), Davison & Chew Yen Fook (1996), Dickinson *et al.* (2002b), Dymond (1994), Ford & Davison (1995), Gibson-Hill (1949), Gregory-Smith (1995, 1997a), Holmes (1994, 1996), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lim Boo Liat (1965), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), McClure (1966, 1967), Medway & Wells (1976), Mees (1986), Oberholser (1917b, 1917c), Rheindt (2004), Riley (1938), Robson (2000), Smythies (1957, 1986, 1999), Vowles & Vowles (1997), Wells (1990b, 2005), Wilkinson, Dutson & Sheldon (1991).

44. Spectacled Bulbul

Pycnonotus erythropthalmos

French: Bulbul oeil-de-feu **German**: Salvadoribülbül **Spanish**: Bulbul de Anteojos
Other common names: Lesser Brown Bulbul

Taxonomy. *I*[*xos*]. *erythropthalmos* Hume, 1878, Pakchan estuary, Myanmar.
Genus as currently constituted probably polyphyletic; in-depth analysis of morphology, voice, behaviour and genetics required to redefine its limits. This species probably warrants placement with *P. brunneus* in a separate genus; both appear rather distantly related to the "*P. capensis* complex" and "*P. cafer* complex". Species name often misspelt as *erythrophthalmos* or *erythropthalmus*. Earlier names for this taxon (*simplex* and *pusillus*) are invalid, as either improperly instated or preoccupied within genus. Form on Borneo has been thought subspecifically distinct, and was initially named *pusillus*, then renamed *salvadorii*, but indistinguishable in larger series from other populations. Three other described races, *cyanochrous*, *isus* and *pammicrus* (all from W Sumatran islands), also treated as junior synonyms. Monotypic.
Distribution. S Myanmar (Tenasserim), S Thailand, Peninsular Malaysia, Sumatra (including Banyak, Nias, Batu, Lingga Archipelago, Bangka, Belitung) and Borneo.



Descriptive notes. 16–18 cm; 16–22 g. Lores, face down to gape, and ear-coverts are olive-brown with greyish cast; rest of cap to back warm olive-brown, rump and uppertail-coverts noticeably more rufescent; upperwings warm olive-brown, tertials and inner secondaries fringed slightly brighter and more rufescent; tail dark brown with faint rufous tinge, feathers fringed at bases with brighter rufous-brown; chin and throat pale smoky grey; breast grey, browner at side and on flanks, infused with pale creamy yellow; belly and undertail-coverts creamy white, tinged tawny; underwing-coverts yellow; iris deep red, orange to yellow-orange eyering, gape yellow-orange; bill blackish; legs dull pinkish-brown. Distinguished from very similar *P. brunneus* mainly by orange eyering (conspicuous at close range), duller and greyer crown and mantle, more rufescent rump and uppertail-coverts, whiter or buffier throat and belly (never tinged brown or olive), greyer breast and upper belly, also slightly smaller size, smaller, more sharply pointed and blacker bill. Sexes alike, female fractionally smaller than male. Juvenile has upperparts and wings slightly paler and warmer brown, iris light brown, grey or red-brown, off-white eyering, browner bill than adult. Voice. Usual song a distinctive, repeated, rather high-pitched mechanical phrase, also described as a hurried, musical jingle, or a "galloping trill", hard to transcribe but sounding like "pip-pippidi", "ke-pippidi" or "wip-wip-wi'i'i'i'i"; also a slower "pi-pi-di", without introductory grace note. Main calls short, rather airy little phrases, e.g. "willy-nilly" or "pippi-dippi", with occasional downswept extra note, "willy-nilly-no".
Habitat. Middle stratum and understorey of mature and regenerating broadleaf evergreen forest, peatswamp-forest, edges, roadsides, riversides, secondary growth, overgrown orchards, mature gardens, mangroves backed by woods; often ventures out into shrubby clearings. On average, prefers slightly less open habitats than those occupied by *P. simplex* and *P. brunneus*. In survey of Khao Nor Chuchi Wildlife Sanctuary, in Thailand, found only in mature forest; in contrast, in standardized mist-netting in Negeri Sembilan, in Peninsular Malaysia, many more trapped in 20-year-old regenerating forest than in nearby mature forest. Plains level and slopes, to recorded upper limit of c. 1000 m.
Food and Feeding. Fruit; some specimens had also consumed whole flowers and buds; a certain amount of insects (including caterpillars) also eaten. Nestling diet consists of both fruit and insects. As most of its forest-dwelling congeners, exploits the mass-produced small fruit of gap-colonizing trees, including *Macaranga*; also takes many figs (*Ficus*), including banyans, and 11 (all in fruit-diameter range 5·4–15·5 mm) of 25 *Ficus* species in study at Kerau, in Peninsular Malaysia. Other species visited include *Acacia mangium*, *Dillenia excelsa*, *Callicarpa albida* and *Gmelina*. Usually encountered singly, or in pairs; occasional single-figure parties may be families groups or individuals converged independently on a food source. Often attends fruiting trees and shrubs, with other bulbuls.
Breeding. Feb–Aug. Nest a deep open cup built of twigs, dead leaves, rootlets and vegetable fibres, lined with fine dry grass; one was 3 m up among crown twigs of sapling in forest clearing, sheltered under a leaf, another low down in thick undergrowth, and another at top of 10-m rubber (*Hevea*) sapling. Clutch 2 eggs; older nestlings fed by one or more adults every 15–20 minutes. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Fairly common in most of range; rare in S Myanmar. Generally less common than *P. simplex* and *P. brunneus* (and less often in groups). Extinct in Singapore owing to clearance of much habitat.
Bibliography. Chasen & Hoogerwerf (1941), Chasen & Kloss (1930), Danielsen & Heegaard (1995), Davison & Chew Yen Fook (1996), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Dymond (1994), Gibson-Hill (1949), Gregory-Smith (1997a), Holmes (1994, 1996), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Mayr (1938), Medway & Wells (1976), Mitra & Sheldon (1993), Oberholser (1912), Riley (1938), Robson (2000), Round & Brockelman (1998), Smythies (1957, 1986, 1999), Strange (2002), Vowles & Vowles (1997), Wells (2005).

PLATE 18 ➤



PLATE 18

inches 3

cm 8

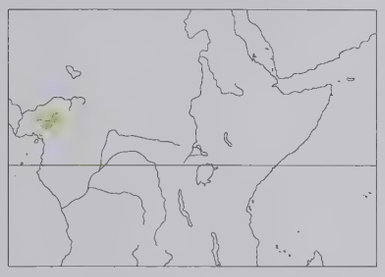
Genus *ANDROPADUS* Swainson, 1831

45. **Cameroon Montane Greenbul**

Andropadus montanus

French: Bulbul concolore **German**: Einfarbbülbül **Spanish**: Bulbul Montano
Other common names: Cameroon (Mountain) Greenbul, Mountain (Little) Greenbul

Taxonomy. *Andropadus montanus* Reichenow, 1892, Buea, 950 m, Mount Cameroon, Cameroon.
Genus formerly submerged in *Pycnonotus*. Has been suggested to form a superspecies with *A. masukuensis*, and in the past considered conspecific, but differs significantly in plumage and voice; also, while recent fieldwork and molecular evidence indicate that latter is more closely related to *A. tephrolaemus*, phylogenetic studies indicate that present species is sister-taxon to both. Monotypic.
Distribution. Extreme SE Nigeria (Mt Gangirwal, Gotel Mts and Obudu Plateau) and W Cameroon (Tchabal Mbabo and Bamenda Highlands S to Mt Cameroon).



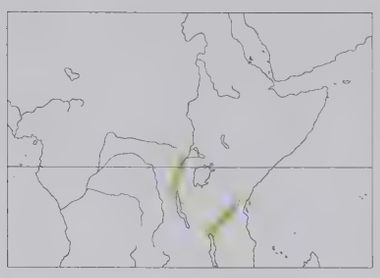
Descriptive notes. 17–18 cm; male 30–34 g, female c. 30 g. A medium sized, uniformly plumaged montane greenbul. Head and entire upperparts, including wings and tail, are yellowish olive-green, slightly brighter on rump and uppertail-coverts; lores a little greyer, with inconspicuous, non-contrasting yellowish-olive eyering slightly paler than surrounding feathering; underparts also yellowish olive-green, somewhat brighter yellow on lower breast, belly and undertail-coverts; iris bright red or red-brown; bill black; legs grey or grey-black. Sexes alike, female on average smaller than male. Juvenile little known; probable immature had grey-brown eye and yellowish-grey feet. Voice. Song soft and unobtrusive, a somewhat subdued nasal, husky babble ending with faster, rather cheerful chuckling phrase, "churp-churp-churp-chipurchipurcherr". Calls include low "kerr" or "purr" (easily overlooked) and rapidly repeated nasal "chup".
Habitat. Mid-altitude and, particularly, montane forest, especially forest edge, clearings, secondary regrowth and adjacent scrub. Mainly 1000–2500 m, but recorded to 500 m on slopes of Mt Cameroon in non-breeding season.
Food and Feeding. Fruit, including *Harungana*, *Maesa* and probably *Myrica* and *Schleffera*; also seeds and insects. Usually occurs singly, sometimes in pairs; unobtrusive and shy. Forages generally low down in dense shrub layers, occasionally up to 10 m.
Breeding. Nesting recorded in Cameroon in Mar and May, birds in breeding condition in Jan–Feb and Nov, nest-building in Mar, and juveniles in Feb–Apr. No other information.
Movements. Little information. Probably largely resident, but some evidence of seasonal movements to lower altitudes during non-breeding season.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Cameroon Mountains EBA. Variously scarce to common in different parts of its range. Considered potentially threatened by unsustainable exploitation of timber, uncontrolled burning, and clearance of habitat for agriculture. Occurs in Gashaka-Gumti Reserve, in Nigeria, and in Banyang Mbo Wildlife Sanctuary and Rumpi Hills and Bali-Ngemba Forest Reserves, in Cameroon; other localities from which it is known are not formally protected in any way.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Bowden (2001), Butchart & Stattersfield (2004), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1998b, 1999, 2000, 2001b), Eisentraut (1963, 1973), Elgood *et al.* (1994), Fishpool & Evans (2001), Fotso (1996), Hall & Moreau (1970), Keith *et al.* (1992), Larison *et al.* (2000), Louette (1981), Mackworth-Praed & Grant (1973), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart (1986).

46. **Shelley's Greenbul**

Andropadus masukuensis

French: Bulbul des Masuku **German**: Shelleybülbül **Spanish**: Bulbul de las Masuku
Other common names: Kakamega Greenbul (*kakamegae*)

Taxonomy. *Andropadus masukuensis* Shelley, 1897, Masuku Range, 7000 feet [c. 2140 m], northwest of Lake Nyasa, Malawi.
Genus formerly submerged in *Pycnonotus*. Has been suggested as forming a superspecies with *A. montanus*, and in the past considered conspecific, but differs significantly in plumage and voice. Recent molecular data, however, supporting similarities in vocalizations and aspects of behaviour (including scansorial foraging technique), indicate that it forms a superspecies with *A. tephrolaemus*, with *A. montanus* as sister-taxon to both. Race *kungwensis* originally described under *A. tephrolaemus*, when latter considered conspecific with *A. nigriceps*. Has been proposed that grey-headed races (*kakamegae*, *kungwensis*) and green-headed ones (*roehli*, nominate) represent two incipient species; genetic analyses support close relationship between last two taxa, and available data (although insufficient for proper assessment) reinforce the hypothesis that the relationship with the two other races may be more distant. Four subspecies recognized.
Subspecies and Distribution.
A. m. kakamegae (Sharpe, 1900) – E DRCongo (from SE edge of Ituri S to Mt Kabobo), SW Uganda (Kalinzu, Bwindi), SW Rwanda, W Burundi, W Tanzania (Kigoma) and W Kenya.
A. m. kungwensis (Moreau, 1941) – Kungwe-Mahari Mts, in W Tanzania.
A. m. roehli Reichenow, 1905 – NE, C & SW Tanzania (from South Pare Mts and Usambaras S in Eastern Arc range to Songea and Njombe).
A. m. masukuensis Shelley, 1897 – SW Tanzania (Rungwe, Ukinga) and extreme N Malawi (Misuku Hills).



Descriptive notes. 16·5–17 cm; male 22–28 g, female 20–25 g (*kakamegae*). A medium-sized, montane greenbul with distinctive foraging behaviour. Nominate race has top and side of head olive-green, narrow contrasting white broken eyering, some indistinct darker and paler streaking on ear-coverts; upperparts, including wings and tail, brighter greenish-olive, brightest on rump and uppertail-coverts; throat grey-olive; underparts dull olive-green, paler than upperparts, palest and washed yellow on centre of breast and belly; iris brown to red-brown or chestnut; upper mandible black or dark brown, lower mandible grey, blue-grey or slate; legs slaty blue to blue-grey to grey-green or green. Differs from *A. gracilis* and *A. ansorgei* in larger size, more empahatically grey head (*kakamegae*), more yellow underparts; from *A. milanjensis* in smaller size, duller underparts, less obviously pale-streaked ear-coverts. Sexes alike, female on average smaller thana male. Juvenile resembles adult, but duller above, breast and crown more olive. Race *roehli* has top of head somewhat duller than nominate, eyering wider, side of head greyer, throat grey, underparts more grey-olive; *kakamegae* has grey head, throat also grey, underparts brighter, more yellow-olive, than nominate; *kungwensis* is also grey-headed, top of head dark grey, throat paler grey than face, breast pale grey with greenish wash, greener on belly and flanks. Voice. Relatively little known. Race *roehli* has fairly loud, simple "ke-kew-ke-kew-ke", soft, nasal "kwew, kwa, kwew" and subdued "wit-wit-wit"; nominate has soft, lilting song of c. 8 notes, "chip, wa-da-tee, chee-tu, ti-wew", repeated with little variation; *kakamegae* largely silent.
Habitat. Montane and mid-altitude forest, also gallery forest; 1000–2300 m in DRCongo, 900–2300 in E Africa, 1600–2000 m in Malawi; commonest at 1300–1500 m in Eastern Arc Mts of Tanzania.
Food and Feeding. Arthropods and small fruits. Fruits recorded in diet include *Harungana*, *Maesa*, *Maesopsis*, *Renealmia*, *Trema*, *Urera*. Insects may form up to 90% of diet in wet season, falling to less than 60% in dry season. Usually occurs singly or in pairs, in larger numbers at fruiting trees. Regularly joins mixed parties, more so in dry season, and has been recorded as attending *Dorylus* ant swarms. Unobtrusive, but not particularly shy. Forages at all levels, from ground layer to canopy, most commonly between 4 m and 8 m; tends to forage higher in dry season. Feeds in dense tangles of lianes and shrubs and low thickets (e.g. of *Dracaena* and *Acanthopale*); regularly works over outer edges of foliage for berries and insects. Also has distinctive habit (nominate race, *roehli* and *kakamegae*, at least) of systematically gleaning from bark of large tree trunks and vertical branches and stems, by clinging to them while searching in crevices, behind loose bark, in epiphytic mosses and similar places; regularly does this by starting at base of a large tree, working up it in short hops for 6–10 m, then flying down to base of next tree and repeating process. Also gleans insects from sides and undersurfaces of horizontal branches. Occasionally flicks wings while feeding.
Breeding. Feb and Sept–Nov in DRCongo, in Jan–Feb, Jul–Aug and Oct–Dec in Tanzania, and in Oct–Nov in Malawi; birds in breeding condition in Mar and Oct–Nov in Uganda and in Jun in Kenya. Nest a shallow cup, external diameter 7·5–9 cm, internal diameter 5 cm, made of fibrous material such as vine tendrils, rootlets, flower stalks, veins from skeletonized leaves and moss, unlined or lined with black fibre (possibly *Marasmius* hyphae), placed 1·5–5 m above ground in fork of small sapling. Clutch 1–2 eggs; no information on incubation and nestling periods.
Movements. Largely resident; some movement to lower altitudes during cold/dry seasons recorded in Tanzania (Usambara, at 500 m), and record of an individual at 1250 m in riparian forest in Malawi may represent another instance of such movement.
Status and Conservation. Not globally threatened. Generally fairly common, and even locally abundant. Densities difficult to assess owing to this species' relative lack of vocalizations; in Eastern Arc range of Tanzania, up to c.35 individuals/km² reported in one study and 168 individuals/100 ha in Udzungwa Mts in another. Occurs in several national parks, including Virunga National Park, in DRCongo, Kibira National Park, in Burundi, Bwindi-Impenetrable Forest National Park, in Uganda, and Udzungwa and Mahali Mountain National Parks, in Tanzania; also in numerous forest reserves, including those of Nyungwe, in Rwanda, Kakamega, in Kenya, East and West Usambara and Uluguru Mountains, in Tanzania, and Misuku Hills, in Malawi.
Bibliography. Bennun (1994), Benson & Benson (1977), Britton (1972, 1980), Brown & Britton (1980), Burgess & Mlingwa (2000), Byaruhanga *et al.* (2001), Chapin (1953), Dinesen (1995, 1997), Dowsett (1990), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire (1989), Dowsett-Lemaire & Dowsett (2004), Hall & Moreau (1964, 1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Moyer (1993), Prigogine (1971, 1978, 1984), Romdal (2001), Roy *et al.* (1998), Sclater & Moreau (1932), Stevenson & Fanshawe (2002), Svendsen & Hansen (1995), Turner & Zimmerman (1979), Willis (1983), Zimmerman (1972), Zimmerman *et al.* (1996).

47. **Western Mountain Greenbul**

Andropadus tephrolaemus

French: Bulbul à gorge grise **German**: Bergwaldbülbül **Spanish**: Bulbul Pechioliva
Other common names: Grey-throated Greenbul

Taxonomy. *Trichophorus tephrolaemus* G. R. Gray, 1862, Mt Cameroon, 7000 feet [c. 2140 m], Cameroon.
Genus formerly submerged in *Pycnonotus*. Recent phylogenetic studies indicate that this species forms a superspecies with *A. masukuensis*; the two exhibit some similarities in vocalizations and behaviour (including scansorial foraging technique). Previously thought to form a superspecies with *A. nigriceps*, and often treated as conspecific, but differs in several aspects, including plumage and, especially, voice. Races vary clinally; birds nearer Mt Cameroon (e.g. on Mt Kupé) intermediate between nominate and *bamendae*. Two subspecies recognized.
Subspecies and Distribution.
A. t. tephrolaemus (G. R. Gray, 1862) – extreme SE Nigeria (Mambilla Plateau, Gotel Mts, Obudu Plateau) and W Cameroon (Tchabal Mbabo and Bamenda Highlands S to Rumpi Hills, Bakossi Mts and Mt Kupé).
A. t. bamendae Bannerman, 1923 – SW Cameroon (Mt Cameroon) and Equatorial Guinea (Bioko).

On following pages: 48. Eastern Mountain Greenbul (*Andropadus nigriceps*); 49. Stripe-cheeked Greenbul (*Andropadus milanjensis*); 50. Grey Greenbul (*Andropadus gracilis*); 51. Ansorge's Greenbul (*Andropadus ansorgei*); 52. Plain Greenbul (*Andropadus curvirostris*); 53. Slender-billed Greenbul (*Andropadus gracilirostris*); 54. Yellow-whiskered Greenbul (*Andropadus latirostris*).



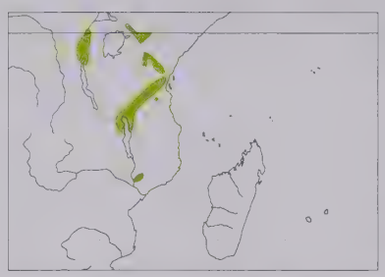
Descriptive notes. c. 18 cm; 29–40 g (nominate), 32–47 g (*bamendae*). Medium-sized, distinctive, montane greenbul. Nominate race has head and neck slate-grey, with lores and ill-defined narrow stripe above eye a little darker; contrasting narrow white broken eyering; upperparts, including wings and tail, bright olive-green, brightest on uppertail-coverts; throat and top part of breast pale slaty grey, rest of underparts yellowish-olive, darkest across breast and on flanks, more yellow on belly; iris brown, hazel, red-brown or dark red; bill black; legs greenish, greenish-grey or blue-grey. Sexes alike, female on average smaller than male. Juvenile is duller, head washed olive, underparts darker, eye brown. Race *bamendae* is slightly larger, darker, duller, less yellow, than nominate, with dark olive wash on breast. Voice. Song a monotonous, steady dry series of notes, same form repeated continuously, "whup-wheep-whip-whupchipip" and "whup-weep-whup-wheep-whup-wheep", also faster series of nasal, chirruping notes. Call a nasal, scolding "whee-up" or "dzut-dzuwi", second note upslurred; low nasal "waa" in flight.
Habitat. Mid-altitude and, particularly, montane forest, including clearings, secondary regrowth and adjacent scrub. Occurs at 400–2850 m, but not common below 1000 m; juveniles recorded down to sea-level on Mt Cameroon, but exceptional.
Food and Feeding. Diet mainly fruit, particularly figs (*Ficus*) and *Maesa*; also some insects, including beetles (Coleoptera). Occurs singly, in pairs or in small family groups; large numbers may gather at fruiting trees. Joins mixed-species flocks. Forages at all levels, from low undergrowth to canopy. Gleans insects acrobatically from moss-clad branches, including undersides; also clings to bark of tree trunks, as *A. masukuensis*.
Breeding. Nesting recorded in Nov–Jun and Aug in Cameroon; mainly in dry season, but may breed in all months. Nest a well-knit cup of moss, tendrils, *Usnea* lichen, plant stems and cobwebs, lined with fine grasses and fibres, external diameter 9–9·5 cm, depth 3·5–6·5 cm, internal diameter 6–7·5 cm, cup depth 3–5 cm; placed 1–3 m above ground, slung between slender horizontal shoots or branches by strands of tendrils, moss or *Usnea*, and well concealed in undershrub or tree-fern. Clutch 1–2 eggs; no information on incubation and fledging periods.
Movements. Little information. Probably largely resident; some evidence of seasonal movements to lower altitudes, particularly by juveniles, during non-breeding season.
Status and Conservation. Not globally threatened. Restricted-range species: present in Cameroon Mountains EBA. Generally common, sometimes abundant, across most of its range, except at lower altitudes. Density estimated at 4–5 birds/ha on Mt Oku, in Cameroon. Occurs in Gashaka-Gumti Reserve, in Nigeria, and Banyang Mbo Wildlife Sanctuary, Rumpi Hills Forest Reserve and Bali-Ngemba Forest Reserve, in Cameroon; also in Basilé Peak National Park and Luba Caldera Scientific Reserve, on Bioko. Other localities from which it is known are not formally protected in any way.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Bowden (2001), Chappuis (1975), Dowsett (1990), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1998b, 2001b), Eisentraut (1963, 1973), Elgood *et al.* (1994), Fishpool & Evans (2001), Forboseh *et al.* (2003), Fotso (1996), Hall & Moreau (1970), Keith *et al.* (1992), Larison *et al.* (2000), Louette (1981), Mackworth-Praed & Grant (1973), Pérez del Val (1996), Roy *et al.* (1998), Serle (1950b, 1954), Stattersfield *et al.* (1998), Stuart (1986).

48. **Eastern Mountain Greenbul**

Andropadus nigriceps

French: Bulbul à tête sombre **German**: Schwarzkappenbülbül **Spanish**: Bulbul Cabecioscuro
Other common names: Olive-breasted Mountain Greenbul; Green-throated/Greenish-throated Greenbul (*chlorigula*)

Taxonomy. *Xenocichla nigriceps* Shelley, 1889, Mount Kilimanjaro, 6000 feet [c. 1830 m], Tanzania.
Genus formerly submerged in *Pycnonotus*. Often treated as forming a superspecies with, or conspecific with, *A. tephrolaemus*, but differs in plumage and, especially, voice; recent studies, however, indicate that latter is more closely allied with *A. masukuensis*, race *kungwensis* of which was originally described under *A. tephrolaemus* (then considered conspecific with present species). Race *chlorigula* sometimes considered a separate species. Phylogenetic analysis suggests that N races (nominate, *kikuyuensis*, *usambarae*) form a clade only rather distantly related to S forms (*chlorigula*, *neumanni*, *fusciceps*) and, further, that relationships within latter group may not be very close; in addition, of the forms tested, the N races appeared to be more closely related to *A. milanjensis* (of race *striifacies*) than to S races of present species, although support for this relationship was not statistically significant. These findings, different from those inferred from morphological studies, have resulted in proposals for elevation of some or, indeed, all races to species level; the case for such treatment, however, not yet proven, and vocal differences between at least some of the races are small; more studies required. Six subspecies recognized.
Subspecies and Distribution.
A. n. kikuyuensis (Sharpe, 1891) – E DRCongo (Ruwenzoris S to Mt Kabobo), SW and SE Uganda, Rwanda, Burundi, and Mt Elgon and C Kenya Highlands.
A. n. nigriceps (Shelley, 1889) – S Kenya (Nguruman) and adjacent N Tanzania (Mt Kilimanjaro and Crater Highlands S to Mbulu and Mt Hanang).
A. n. usambarae (Grote, 1919) – SE Kenya (Taita Hills) and NE Tanzania (S Pare and W Usambara Mts).
A. n. chlorigula (Reichenow, 1899) – EC & S Tanzania (Kiboriani and Nguru Mts S to Iringa, Njombe and Songea).
A. n. neumanni (Hartert, 1922) – E Tanzania (Uluguru Mts).
A. n. fusciceps (Shelley, 1893) – SW Tanzania (Poroto Mts, Rungwe) S to extreme NE Zambia (Mafingas, Makuta and Nyika), NC & SE Malawi (S Viphya Plateau, also Zomba and Mt Mulanje) and WC Mozambique (Mt Namuli).
Descriptive notes. c. 18 cm; male 29–41 g, female 29–32·5 g (*kikuyuensis*). A medium-sized, variably but distinctively patterned montane greenbul. Nominate race has forehead and crown blackish, sharply demarcated lores and side of face (including ear-coverts) dark grey with some wide, contrasting paler streaking, also contrasting dirty white broken eyering; neck dark grey, upperparts, including wings and tail, olive-green, brightest on uppertail-coverts; grey below, paler and washed yellow in middle of belly, flanks washed olive-yellow, undertail-coverts yellow-olive; iris brown, hazel, red-brown or dark red; bill shiny black; legs blue-grey, greenish-grey, greenish or greenish-brown. Differs from *A. milanjensis* mainly in colour and pattern of head. Sexes alike, female on average smaller



than male. Juvenile is duller, darker overall, eye brown or grey-brown. Race *kikuyuensis* has whole of head, neck and upper mantle slate-grey, except for variable ill-defined darker streak above eyering (indistinct superciliary stripe), fainter darkish line below eye and some lines on ear-coverts, brighter olive-green above, light grey throat and upper breast, rest of underparts bright olive-yellow, brightest on belly; race *usambarae* has top of head as previous, but more distinct narrow black supercilium from above lores to behind eye, narrow ill-defined dark line on rear ear-coverts at junction with olive-green neck side, underparts as nominate; *neumanni* has blackish crown like nominate, but lacks contrasting eyering and paler streaking on side of face; *fusciceps* has crown dull grey, washed olive, black superciliary stripe, little or no pale streaking on ear-coverts, broken white eyering broad, upperparts dull green, underparts dull grey, washed brownish, lower flanks grey-olive, undertail-coverts dull yellowish-olive with mottled appearance (pale tips); *chlorigula* has grey head washed brownish, broken white eyering broad, little or no pale streaking on head side but blackish preocular and postocular areas, chin pale grey, throat olive-yellow, becoming olive-green on breast side, rest of underparts grey, belly centre paler, lower flanks and undertail-coverts yellow-olive, latter appearing mottled (pale feather tips). Voice. Race *chlorigula* has 5-note song, "chip-chop-cho-chilly" (transliterated as "it's not so chilly"), first note short, increasing in volume at end, delivered at c. 10-second intervals; *fusciceps* similar but last 2 notes more extended, "chip-chop-wicho-weeyo", also a shortened phrase, "chop-wi-choda"; call a chattering, repeated "twuk", also "pichu" or "hor-pi-chu". In nominate and *usambarae* at least two types of song reported, one a deliberate "kwo, kwer-kwer, kwee, kwo" (recalling *chlorigula*), other a conversational "kwew-ki-kwew-ki-kwew"; *usambarae* also as "hee-her-hee". Song of *neumanni* "chipchuck, chuck choo-kweeo" (differs only slightly from *chlorigula*); that of *kikuyuensis* (in Rwanda) of two types, a fairly well-defined phrase of 6–8 distinct notes, "jur-jitjur-dajur-jur-jerry", repeated with minor variations and last note upslurred (recalling *nigriceps* and *chlorigula*), and a husky, low, nasal phrase lasting 1–2 seconds, notes all on one pitch, rich in harmonics, and lacking boisterous cheerful quality and distinct phrases of Tanzanian races. Call a loud, rapid, nasal "qwer-qwer-qwer-qwer", alarm in Kenya a short, grating "churr". Situation confused, as it is suspected that some earlier published descriptions of vocalizations now refer to other species.
Habitat. Montane forest of all types, both primary and secondary, including low-canopy forest, riparian forest, as well as montane shrubland, bracken-briar and bamboo. Common in secondary regrowth, edges and clearings and in recently deforested areas. At 1350–3300 m in E Africa and 1500–2450 m in Malawi; some regular wandering down to 700–1000 m, once to 500 m.
Food and Feeding. Fruit, also some flowers and parts of leaves; also arthropods, including beetles (Coleoptera) and spiders (Araneae). Extensive range of fruits taken, over 60 species recorded in Malawi; *Agalaea*, *Coccinia*, *Harungana*, *Ilex*, *Maesa*, *Polyscias*, *Rutidea*, *Schleffera*, *Trema* and *Urera* recorded as eaten in Rwanda, and *Euclea*, *Teclea* and members of Rubiaceae in Tanzania. Found singly, in pairs, or in family groups of up to six individuals; larger numbers may gather in fruiting trees, particularly figs (*Ficus*). Attends doryline ant swarms and joins mixed-species flocks. Conspicuous and inquisitive. A generalist that forages at all levels, from undergrowth to subcanopy. Gleans insects from leaves, tangles, epiphytes, branches etc.; also captures them in short aerial sallies.
Breeding. Recorded Mar–Aug and Oct–Nov (may breed all year, with peak during dry season) in DRCongo; Sept–Mar in E Africa, starting in Kenya Highlands before short rains, continuing through and into succeeding dry period, peak in Feb; Sept–Dec, avoiding coldest, wettest months, in Tanzania; Aug–Nov, i.e. end of dry season/start of rains (peak period of both fruit and insects), in Zambia and Malawi. Monogamous; territorial. Nest a neat cup of moss, tendrils, fine roots and grass stalks, lined with dark hyphae of *Marasmius* fungus, external diameter 13 cm, depth 5·5 cm, internal diameter 7 cm, cup depth 3 cm, built 1–2 m above ground among creepers and undergrowth; mean territory diameter in Malawi 80 m. Clutch 1–3, usually 2; incubation by female only; no information on incubation and fledging periods.
Movements. Mainly sedentary. Some regular downslope movement in at least parts of range, mostly during cool season in Tanzania (Usambaras, Ulugurus); in Malawi (Nyika and Mt Mulanje), recorded down to 700–1000 m, once 500 m, mainly Apr–Aug. For 59 birds ringed on Nyika, greatest recapture distance was 2·5 km, but most moved only 250–500 m.
Status and Conservation. Not globally threatened. Race *chlorigula*, often treated as a full species, a restricted-range taxon: present in Tanzania-Malawi Mountains EBA. Generally common to abundant across its range. Density estimates in Malawi 2–3 pairs/ha in fragmented forest, 1 pair/ha in larger forest blocks (1 pair/2 ha where it competes with *A. milanjensis*). In Eastern Arc mountains of Tanzania, maximum density c. 60 individuals/km². Occurs in numerous national parks, including those of Virunga, in DRCongo, Volcans, in Rwanda, Kibira, in Burundi, Bwindi-Impenetrable Forest, in Uganda, Aberdare and Mount Kenya, in Kenya, Arusha and Udzungwa, in Tanzania, and Nyika, in Malawi, as well as in many forest reserves across its range.
Bibliography. Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brown & Britton (1980), Burgess & Mlingwa (2000), Byaruhanga *et al.* (2001), Chapin (1953), Cordeiro (1994a), Dinesen (1997), Dowsett (1985b, 1990), Dowsett & Dowsett-Lemaire (1984, 1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1989), Dowsett-Lemaire & Dowsett (2004), Friedmann & Loveridge (1937), Fuggles-Couchman (1939), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963), Moreau & Sclater (1938), Prigogine (1971, 1978, 1984), Romdal (2001), Roy *et al.* (1998), Sclater & Moreau (1932), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Svendsen & Hansen (1995), Turner & Zimmerman (1979), Vincent (1935a), Willis (1983), Zimmerman *et al.* (1996).

49. **Stripe-cheeked Greenbul**

Andropadus milanjensis

French: Bulbul montagnard **German**: Olivbrustbülbül **Spanish**: Bulbul de las Milanji
Other common names: Olive-headed Greenbul (*striifacies* and *olivaceiceps*)

Taxonomy. *Xenocichla milanjensis* Shelley, 1894, Mulanje, south Malawi.
Genus formerly submerged in *Pycnonotus*. Recent molecular studies have suggested possibility of close relationship between race *striifacies* and N races of *A. nigriceps* (nominate, *kikuyuensis*, *usambarae*), although the data are not statistically significant. Has also been proposed, on basis of morphological differences (including eye colour), that *olivaceiceps* and *striifacies* together be given status of a separate species; eye colour within both is variable, however, and vocal differences among races appear not to support such treatment; further studies needed. Poorly marked race

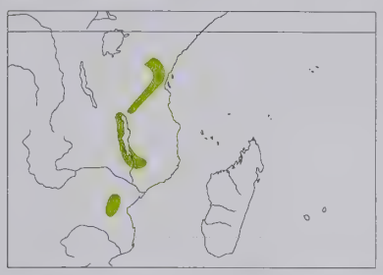
disjunctus (described from E Zimbabwe) considered indistinguishable from nominate. Three subspecies recognized.

Subspecies and Distribution.

A. m. striifacies (Reichenow & Neumann, 1895) – highlands of SE Kenya S to SW Tanzania (S to Udzungwas).

A. m. olivaceiceps (Shelley, 1896) – highlands of SW Tanzania (Rungwe), Malawi (except Mt Mulanje) and NW Mozambique (Unangu).

A. m. milanjensis (Shelley, 1894) – highlands of SE Malawi (Mt Mulanje), extreme E Zimbabwe and WC Mozambique.



Descriptive notes. c. 19 cm; male 33–45·5 g, female 34·5–47·5 g. A medium-large, brightly coloured greenbul with conspicuously marked ear-coverts, notable for racial variation in eye colour. Nominate race has grey head and neck, conspicuous white shaft streaking beneath eye and, particularly, on ear-coverts, conspicuous white crescent above eye, remainder of eyering narrower, paler and less contrasting; upperparts, including wings and tail, olive-green; chin and upper throat pale grey, lower throat and rest of underparts dull greenish-olive, darker on breast and flanks, yellower on belly; iris pale grey or brown; bill black; legs grey, greyish-brown or brown. Sexes alike, female on average smaller than male. Juvenile is as adult, but greener on crown, eye grey-brown. Race *striifacies* has top of head and neck bright olive-green, uniform with rest of upperparts (brighter than nominate), side of face contrastingly blackish, streaked white on cheeks and ear-coverts, no white eyebrow, chin olive-washed pale grey, underparts olive-yellow (brighter than nominate), eye pale bluish-grey, reddish-brown or, rarely, yellow (juvenile with dull-streaked greenish cheeks and ear-coverts, duller greyish-washed underparts, sepia bill with yellow gape, dark brown or sepia eye, light dusky grey legs); *olivaceiceps* resembles previous but is somewhat darker and greener above (though not as dull as nominate), greener, less yellow, below, with eye yellow in S of range but chestnut in N. Voice. Song 8–12 dry, short notes of same pitch, with distinct rhythm that varies regionally. In Zimbabwe (nominate race) song 4 measured notes followed by 3 delivered rapidly, ending with short trill, "chop-chap-chip-chip, chipa-chip, prrrr"; in N Malawi (*olivaceiceps*) slower, of up to 4–5 measured notes, "cho, cha, chip, cho, chip", "cherp, cho, cher, chip", "cherp, chorp, chip" or merely "were-chop"; in E Africa (*striifacies*) 3 measured notes and then 3 run together, ending with double note rather than trill, "chip-chop-chop, peechopee, chochop", also prolonged monotonous "piku-piku-piku-piku-piku…" and slower "qua quee-qua, qua quee-qua". Contact call is a loud rapidly repeated "cha", and (*striifacies*) "ookeri" or "u-ki-rii".

Habitat. Montane and submontane forest, riverine forest, adjacent scrub and thicket and, locally, plantations; found in both forest interior and edge habitats. Mainly 900–2145 m in E Africa and 1100–2000 m (rarely 2250 m) in Malawi, commonest at 1500–1800 m in Eastern Arc forests of Tanzania; descends to lower elevations during cold periods, moving down to 150 m in Usambaras, to 250 m in Ulugurus (Tanzania), to 600 m on Mt Mulanje (Malawi) and to 350 m at Haroni-Rusitu (Zimbabwe).

Food and Feeding. Omnivorous. Fruits, seeds; also arthropods, worms; also small vertebrates, including chameleons (*Chamaeleo*) and frogs (of genus *Arthroleptis*). Large range of fruits recorded (25 species in Malawi), e.g. *Loranthus*, *Lantana*, *Ficus*, *Rapanea* and *Sapium*; in Tanzania *Euclea*, *Teclea* and members of Rubiaceae recorded as eaten. Arthropods taken include beetles (Coleoptera), earwigs (Dermaptera), butterflies and caterpillars (Lepidoptera). Occurs both singly and in small vocal parties; many may gather at fruiting trees. Occasionally joins mixed-species flocks; sometimes attends *Dorylus* ant swarms. Forages mostly in middle and upper strata, but can be found at all levels. Gleans insects from branches and foliage, also in short aerial sallies. Sometimes shy and skulking, but can be more bold; attracted to fruiting bushes at or shortly beyond forest margin.

Breeding. Recorded in Oct, Dec–Feb, May and Jul in E Africa (birds in breeding condition and dependent juveniles in Jul–Aug, nest-building in Nov, in Tanzania); Sept–Oct in Malawi, Nov–Dec (in breeding condition in Aug) in Mozambique, and Oct–Mar (mainly Nov–Dec) in Zimbabwe. Monogamous; territorial. Nest a thin, neat rounded cup made of roots, grass, tendrils, twigs, bark fragments, and dead and skeletonized leaves, decorated externally with moss, lichens and cocoons, lined with fine grass, plant fibres and roots of tree-ferns, external diameter 9–13 cm, depth 6·5–8 cm, internal diameter 6·5 cm and cup depth 2–3 cm; built 2–7 m above ground, usually in vertical fork at top of well-foliaged subcanopy sapling, or in horizontal fork near end of branch, or well hidden between creeper stems. Clutch 2 eggs, sometimes 1; incubation by female only; no information on incubation and fledging periods.

Movements. Mainly resident; seasonal movements to lower altitudes during cold or dry seasons in at least some parts of range, as in Tanzania (Usambaras and Ulugurus) and Zimbabwe. One record from Pugu Hills (at 300 m), in coastal Tanzania, c. 200 km from nearest known breeding population.

Status and Conservation. Not globally threatened. Generally rather common. In Malawi, at least, densities vary considerably, highest in N, where at least 5 pairs/10 ha recorded; abundance much lower in areas where *A. nigriceps* is also present. In Tanzania, maximum density in Eastern Arc mountains c. 30 birds/km², while another study recorded 138 individuals/100 ha in Udzungwa Mts. Found in Arusha and Udzungwa National Parks, in Tanzania, Nyika National Park, in Malawi, and Chimanimani National Park, in Zimbabwe, as well as in numerous forest reserves across its range.

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50. Grey Greenbul

Andropadus gracilis

French: Bulbul gracile **German**: Zwergbülbül **Spanish**: Bulbul Grácil
Other common names: Little Grey Greenbul

Taxonomy. *Andropadus gracilis* Cabanis, 1880, Angola.

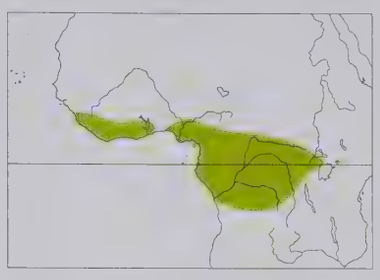
Genus formerly submerged in *Pycnonotus*. Sibling species of *A. ansorgei*. Similarities in appearance both to latter and to *A. curvirostris* have resulted in much confusion, historically and currently, which has obscured the status of each. Three subspecies recognized.

Subspecies and Distribution.

A. g. extremus Hartert, 1922 – W Guinea E to Togo and SW Nigeria.

A. g. gracilis Cabanis, 1880 – SE Nigeria (E of R Niger, also isolated population on Jos Plateau) E to C DRCongo and S to N Angola.

A. g. ugandae van Someren, 1915 – E DRCongo E to C Uganda and W Kenya.



Descriptive notes. c. 16 cm; male 18–23 g, female 19–28 g (*ugandae*). Small, short-tailed greenbul. Nominate race has top of head and neck olive-grey, lores and ear-coverts grey, slightly paler than crown, conspicuous contrasting white eyering; upperparts, including wings, olive-green, rump, uppertail-coverts and tail washed chestnut; throat and upper breast pale olive-grey, rest of underparts greyer with some yellowish-olive, undertail-coverts brown; iris brown, olive-brown or brownish-grey; bill black or dark brown; legs olive-green, brownish-horn or blue-grey. Distinguished from extremely similar *A. ansorgei* by yellow (not ginger) on underparts; from *A. curvirostris* by smaller size, more delicate bill, less contrasting throat, and much more visible eyering; from both of these also by voice. Sexes alike, female on average smaller than male. Juvenile is as adult, but brighter green above and yellow below, throat washed green, eyering yellowish, gape yellow, eye grey-brown, legs olive. Race *extremus* has breast and belly greenish-olive with yellow more extensive, almost pure yellow in centre of belly; *ugandae* is similar to previous, but yellow of underparts rather less bright. Voice. Song 4–5 rapid, jaunty notes, "wheet wu-wheet-wu-wheet", ascending at end, also quieter "tehu-tehee-tee", similar to that of *A. ansorgei* but with more syllables and more lively delivery. Call a short "tyuc tyuc".

Habitat. Primary and secondary evergreen and semi-deciduous forest, gallery forest, seasonal swamp-forest, and forest–savanna mosaic, with preference for edge habitats. Occupies many types of secondary habitat, including abandoned farmland, overgrown plantations, margins of logging roads, and similar; more common in secondary habitats than is *A. ansorgei*. Mostly lowlands, but to 1300 m in Cameroon, 1550 m in DRCongo and 1700 m in E Africa.

Food and Feeding. Fruits and seeds; also arthropods, including orthopterans, mantids, beetles (Coleoptera), moths and caterpillars (Lepidoptera), ants (Hymentoptera), spiders (Araneae); also small gastropods. Fruits taken include *Croton*, *Ficus*, *Macaranga*, *Musanga*, *Ochthocosmus*, *Rauwolfia*, *Trema*. Occurs singly, in pairs or in small family groups; occasionally joins mixed bird parties. Not shy. Forages at all heights, mainly in middle levels (8–15 m in Gabon, 10–25 m in Liberia), but also ranging on occasion up to canopy and down to bushes at 1–2 m in search of ripe fruit. Generally occurs lower down than *A. ansorgei* where the two sympatric. Also gleans from leaves, vegetation tangles, lianes, twigs, sometimes pursuing dislodged insects in short flights.

Breeding. Nesting recorded in May, birds in breeding condition in Nov–Dec and juvenile in Nov in Cameroon; in Jan and Aug, and in breeding condition in Nov–Dec (female soliciting copulation in Mar), in Gabon; elsewhere, birds in breeding condition Jun–Jul and Sept–Oct in Liberia, Jan and Jun in Ghana, Mar and Jul in Nigeria, Sept–Jun in DRCongo and Jan–Feb in Uganda; dependent juveniles seen in Jan in Ivory Coast. Monogamous; territorial. Nest an open cup of rootlets on base of dead leaves, bound together with thin, dry, twisted vines, smoothly lined with fine plant stems and fibres, green leaves incorporated in outer layer for camouflage, external diameter 10 cm, depth 7 cm, internal diameter 6·5 cm and cup depth 4 cm; built c. 2·5 m above ground in foliage at end of horizontal branch of isolated tree; one nest in early stages of construction, built by female alone, was a hammock of dead leaves bound together with cobwebs, base made of mycelium of *Marasmius* fungus, sited 8 m above ground inside bunch of leaves at junction of several twigs on horizontal branch in tree at edge of clearing. Clutch 2 eggs; incubation by female only; no information on incubation and fledging periods.

Movements. Little information; sedentary in Gabon.

Status and Conservation. Not globally threatened. Generally common, and widespread. Adaptable species. Estimated densities in Gabon 10–12 pairs/km² in old second growth and 5–6 pairs/km² in more disturbed habitat, such as farmland; estimated density in Nigeria 1 bird/3 ha. Occurs in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, Kahuzi-Biéga, in DRCongo, and Bwindi-Impenetrable Forest, in Uganda.

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51. Ansorge's Greenbul

Andropadus ansorgei

French: Bulbul d'Ansorge **German**: Ansorgebülbül **Spanish**: Bulbul de Ansorge

Taxonomy. *Andropadus ansorgei* Hartert, 1907, Degama, southern Nigeria.

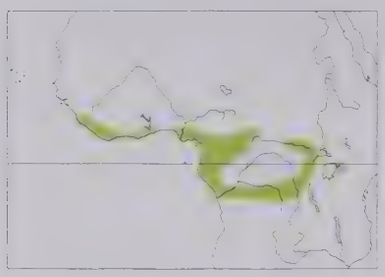
Genus formerly submerged in *Pycnonotus*. Sibling species of *A. gracilis*. Similarities in appearance both to latter and to *A. curvirostris* have resulted in much confusion, historically and currently, which has obscured the status of each; consequently, distribution of nominate race uncertain in many areas. Two subspecies recognized.

Subspecies and Distribution.

A. a. ansorgei Hartert, 1907 – W Guinea E to Togo, SC Nigeria E to W Central African Republic and S PRCongo, NE, E & C DRCongo; also extreme SW Uganda.

A. a. kavirondensis (van Someren, 1920) – W Kenya.

Descriptive notes. c. 16 cm; male 19–21 g, female c. 20 g (nominate), male 17–19 g, female 17–23 g (*kavirondensis*). Small, short-tailed greenbul. Nominate race has top of head and neck olive-grey, lores and ear-coverts grey, slightly paler than crown, conspicuous white eyering; mantle, back and wings olive-green, rump, uppertail-coverts and tail reddish-brown; throat pale brownish-



grey, underparts olive-grey, becoming warm ginger on flanks and lower belly; undertail-coverts rufous-brown; iris dark brown, brown or chestnut; bill black to dark horn, paler cutting edges; legs dark olive or greyish-olive. Distinguished from very similar *A. gracilis* by lack of any visible yellow tones on underparts, from *A. curvirostris* by contrasting grey head, from both also by voice. Sexes alike, female on average smaller than male. Juvenile is as adult, but head and breast somewhat greyer, underparts below breast paler and buffy, gape yellow, legs pale olive. Race *kavirondensis* has grey of head tinged brown, olive-green upperparts also tinged brownish, slightly greyer breast and flanks, centre of belly with faint yellowish wash (visible only in the hand), undertail-coverts yellowish-brown. VOICE. Song "wheet-whuut-whit", "tiu-wheet-tweet" or "hweet tyu-hoo hweet", similar to that of *A. gracilis* but lacking its sprightliness; third syllable sometimes dropped. Also distinctive harsh, rapid, flat trill, "rititttitititit" or "tchitchitchithcithci", not given by *A. gracilis*.

Habitat. Primary and mature secondary evergreen and semi-deciduous forest. Common in dry inselberg forests in Liberia; absent from or very rare in similar habitat in Gabon. Less often in secondary habitats than is *A. gracilis*. Mainly lowlands; occasionally at middle altitude, e.g. 1400 m in Liberia and 1450 m in DRCongo.

Food and Feeding. Fruits, including *Allophylus*, *Macaranga* and *Musanga*, and seeds; also insects, including orthopterans, beetles (Coleoptera), moths and caterpillars (Lepidoptera). Usually seen in pairs, sometimes in small family parties; sometimes joins mixed-species flocks. Not shy. Often forages in crown of low trees, particularly in smaller branches. Mainly in upper middle stratum (25–45 m in Liberia), tending to occur at higher levels than *A. gracilis*, but does descend lower to attend small fruiting trees beside tracks, sometimes with latter species.

Breeding. Nesting recorded in May, birds in breeding condition in Jul and Oct and dependent fledgling seen in Jan in Liberia; in May, Jul and Oct–Dec in Nigeria; birds in breeding condition in Mar, Jul and Nov and juveniles in Nov in DRCongo, where species is suspected to breed through whole rainy season in NE (Ituri). One observation of a nest being built 30 m above ground. No other information available.

Movements. Little information; believed to be sedentary.

Status and Conservation. Not globally threatened. Status uncertain; considered uncommon to locally common, but situation unclear owing to continuing confusion with *A. gracilis*. Occurs in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, Salonga, in DRCongo, and Bwindi-Impenetrable Forest, in Uganda.

Bibliography. Bannerman (1936), Bennun (1994), Borrow & Demey (2001, 2002), Britton (1972, 1980), Brosset & Érard (1986), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Prigogine (1971, 1978, 1984), Rainey & Lachenaud (2002), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985), Turner & Zimmerman (1979), Zimmerman (1972), Zimmerman *et al.* (1996).

52. Plain Greenbul

Andropadus curvirostris

French: Bulbul curvirostre **German**: Alexanderbülbül **Spanish**: Bulbul Piquicurvo
Other common names: Cameroon (Sombre) Greenbul

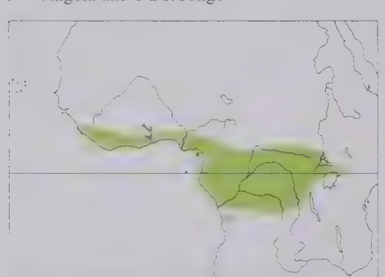
Taxonomy. *Andropadus curvirostris* Cassin, 1859, Camma River, Gabon.

Genus formerly submerged in *Pycnonotus*. May be most closely related to *A. gracilis* and *A. ansorgei*; similarities to both in appearance and behaviour have resulted in much confusion in the field, historically and currently, which has obscured its status. It has recently been suggested that vocal differences between the two races, and the fact that *leoninus* does not react to playback of song of nominate, may imply that they are isolated at the species level. Two subspecies currently recognized.

Subspecies and Distribution.

A. c. leoninus Bates, 1930 – Sierra Leone and SE Guinea E to C Ghana.

A. c. curvirostris Cassin, 1859 – C Ghana E, including Bioko I, to S Sudan and W Kenya, S to N & NW Angola and S DRCongo.



Descriptive notes. c. 17 cm; male 22–29 g, female 22–28 g. A medium-sized, almost featureless greenbul, difficult to identify by plumage characters alone. Nominate race has top of head dark olivaceous brown, side of face and ear-coverts olivaceous grey-brown, lores slightly darker, dirty white or grey broken eyering variable in width and degree of contrast; upperparts dark olivaceous brown, as crown, uppertail-coverts and tail reddish-brown; flight-feathers dark brown, edged olive-green; throat light olive-grey, contrasting somewhat with olive-brown breast; flanks olive-brown, belly yellow-olive, becoming pale yellow in centre of lower belly, undertail-coverts pale brownish-yellow; iris red-brown or chestnut-brown; bill black, paler cutting edges; legs olive, olive-green, dark green or dark greenish-grey. Distinguished from very similar *A. gracilis* and *A. ansorgei* by larger size, less conspicuous eyering, no obvious contrast between head and mantle, also by voice and habits; from *A. virens* by eyering, leg colour and voice. Sexes alike, female on average smaller than male. Juvenile is as adult, but belly more yellow, gape also yellow. Race *leoninus* is slightly darker above than nominate, less reddish on tail, greyer with less yellow below, no visible contrast between throat and breast. VOICE. Song of nominate race a 3-note "wheet-tiuwhee-tuu" or "wheet-tu-wheeu"; also has harsh trill, "trriiiii". Race *leoninus* has unobtrusive but distinctive "tiuwhee-tiu triiiii" or "su-hioo triiii", with stress on final, harsh upslurred trill, which also often given separately. Pitch lower than that of *A. gracilis* and *A. ansorgei*. Also a hard "wrrrrit" and a longer "wrrrrrititit".

Habitat. Primary and secondary evergreen and semi-deciduous forest, gallery forest, old regrowth, clearings and edge habitats. Mainly lowlands, locally at middle altitude, to 1800 m in DRCongo, 1600 m in Sudan and 2300 m in E Africa.

Food and Feeding. Fruits, seeds; also insects, and gastropods. Fruits taken include particularly *Rauwolfia*, also *Allophylus*, *Agelaea*, *Heisteria*, *Harungana*, *Musanga*, *Macaranga*, *Trema*, *Urera*. Insects especially caterpillars, also orthopterans, mantids, moths (Lepidoptera). Usually seen singly, in pairs or in small groups; frequently joins other bulbuls at fruiting trees or in mixed-species flocks. Unobtrusive and fairly shy, preferring to remain concealed in foliage; also perches silently for lengthy periods on low bare branches. Territorial, forages mainly in lower-middle levels, at tops of understorey shrubs and in lianes; mainly at 2–15 m (sometimes higher) in Gabon, 10–30 m in Liberia, 3–10 m in Kenya. Gleans insects from foliage, sometimes while hovering.

Breeding. Nesting recorded in Feb in Ghana and in Jan, Aug and Oct in Sudan; birds in breeding condition in May–Oct and independent young in Dec–Mar and Jun in Liberia; juveniles in Apr in Ivory Coast, and in Aug–Oct and Dec–Jan in Cameroon; increased vocal activity in Sept–Feb and females soliciting copulation Dec–Jan (short dry season) in Gabon; breeding condition in Sept–May in DRCongo, Feb–Mar (and immature in Feb) in Angola, and Jan–Feb, Apr and Jul in E Africa. Territorial. No other information.

Movements. Little information; thought to be sedentary in Gabon and Congo.

Status and Conservation. Not globally threatened. Status somewhat uncertain; considered not uncommon to common. Density in Gabon estimated tentatively at 10–12 pairs/km². Occurs in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, Salonga, in DRCongo, and Bwindi-Impenetrable Forest, in Uganda.

Bibliography. Bannerman (1936, 1953), Bennun (1994), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975, 2000), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1994), Dowsett (1990), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Heyman & Morlion (1980), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Nikolaus (1987, 1989), Pérez del Val (1996), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Smith *et al.* (1996), Stevenson & Fanshawe (2002), Thiollay (1985), Turner & Zimmerman (1979), Waltert & Mühlenberg (1999), Zimmerman (1972), Zimmerman *et al.* (1996).

53. Slender-billed Greenbul

Andropadus gracilirostris

French: Bulbul à bec grêle **German**: Schmalschnabelbülbül **Spanish**: Bulbul Picofino

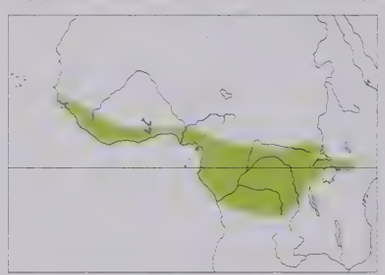
Taxonomy. *Andropadus gracilirostris* Strickland, 1844, island of Bioko (Fernando Póo), Equatorial Guinea.

Genus formerly submerged in *Pycnonotus*. Old name "*Stelgidillas poensis*" is a synonym of present species. Affinities unclear; recent molecular data suggest that this species is remote from all other members of genus and would be better placed in a separate genus. Proposed races *congensis* (Cameroon E to DRCongo and Tanzania) and *chagwensis* (Uganda) exhibit barely perceptible and inconstant differences in colour tone from nominate, and not satisfactorily distinguishable. Two subspecies recognized.

Subspecies and Distribution.

A. g. gracilirostris Strickland, 1844 – SW Senegal and Guinea-Bissau E, including Bioko I, to S Sudan, C Uganda and W Kenya, S to NW Angola, SC DRCongo, Rwanda and N Burundi, also W Tanzania.

A. g. percivali (Neumann, 1903) – C Kenya Highlands.



Descriptive notes. c. 18 cm; male 24–37 g, female 26–40 g. A medium-sized, two-toned, slender, relatively long-tailed greenbul. Nominate race has top of head olive-brown, lores and ear-coverts grey, the latter with some paler streaking, inconspicuous narrow grey eyering; upperparts, including uppertail-coverts and tail, olive-brown; flight-feathers dark olive-brown, edged greenish; pale brownish-grey below, paler than side of face, with throat, centre of belly and undertail-coverts even paler, greyish-white, breast and flanks sometimes washed olive; iris deep red, brick-red or red-brown; bill black; legs black or dark brown. Sexes alike, little difference in size. Juvenile resembles adult, but upperparts browner, breast and flanks washed brown, undertail-coverts cinnamon. Race *percivali* has upperparts more olive-green, less brown, than nominate, underparts paler, more whitish-grey, pale buff towards rear. VOICE. Clear, distinctive, downslurred, extended whistle, "tseeeeu" or "peeuuu", repeated frequently; also has more rarely used song of 4–5 whistled notes, "whee-ti-twheew-ti-whee" or "whuut-héét whuut-héét whuut-héét". Contact call a soft "frue" or "fu-wuwu"; alarm call an agitated "chewi" or "chew-chew".

Habitat. Primary and secondary evergreen and semi-deciduous forest, gallery forest, regenerating farmbush, large trees in farmland, patches of dense woodland in savanna, large gardens. Often in edge habitats, e.g. beside roads and in clearings. Lowlands, up to 1500 m in Liberia and Cameroon, to 2300 m in DRCongo, 2500 m in Rwanda and 2400 m in E Africa.

Food and Feeding. Fruits, including berries, and arils, also seeds; also arthropods, including orthopterans, mantids, bugs (Hemiptera), moths (Lepidoptera), caterpillars, ants (Hymenoptera) and spiders (Araneae). Fruits and arils include, in Gabon and PRCongo, those of *Allophylus*, *Croton*, *Ficus*, *Heisteria*, *Macaranga*, *Morinda*, *Musanga*, *Ochthocosmus*, *Rauwolfia*, *Xylocopia* and, in Rwanda, *Agalaea*, *Bridelia*, *Harungana*, *Ilex*, *Ocotea*, *Podocarpus*, *Syzygium*, *Polyscias*, *Rutidea*, *Sapium*, *Schleffera*, *Trema*, *Urera*. Usually occurs in pairs or small family groups, sometimes singly; large numbers may gather with other bulbuls in fruiting trees and lianes. Also joins mixed-species flocks, usually keeping to highest levels. Very much a species of tree canopies, usually above 25 m in lowland forest; infrequently comes lower, and then staying within crown of smaller trees and bushes. Forages through leaves and inflorescences for insects and fruit. Unobtrusive and quiet, rather than shy, but often calls while sitting upright in canopy. Estimated size of foraging territory in Gabon 8–12 ha.

Breeding. Nesting recorded in Jun and Sept–Jan in Sierra Leone, Oct and Dec in Liberia, Sept, Nov and Jan–Feb (juveniles early Sept) in Cameroon, Nov–Dec in Rwanda, Aug in Sudan; birds in

breeding condition in Feb in Ghana, Jun (young being fed in Jul) in Nigeria, in most months (suspected to breed all year) in DRCongo, Jun in Central African Republic, May and Nov in Uganda, and Jun (fledglings Nov) in Kenya; females soliciting food from males in Dec, Mar and Apr, also copulation observed in Apr, in Gabon. Territorial. Detailed observations only from one site in Sierra Leone. Nest constructed by one individual only, presumably female, accompanied by partner, latter sang at intervals and very occasionally carried nesting material, outer layer of nest built of dead or green leaves, lichens and cobwebs (but no moss), thin lining of petioles, placed in terminal fork of tree (*Dalium*, *Rauwolfia*, *Tecoma*) 6–7 m tall in partial shade, or isolated tree in garden, a little way from scrubby secondary forest. Elsewhere in Sierra Leone, nests often built at 15–20 m; in Gabon, female carrying dead leaves and plant fibres to canopy of tall forest tree, escorted by singing male; in Liberia, observations of nest construction at 7 m, 30 m and 38 m in trees. Clutch 2 eggs; incubation and provisioning, possibly also brooding, by both sexes; no information on incubation and fledging periods. Of four nesting attempts in Sierra Leone study, only one successful, with single young fledged; other three preyed on, possibly by vine snake (*Thelotornis kirtlandii*).

Movements. Little information; thought to be sedentary in Gabon.

Status and Conservation. Not globally threatened. Generally common and widespread. Density in Gabon estimated at 7–9 pairs/km². Adapts well to secondary habitats. Well represented in protected areas.

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54. Yellow-whiskered Greenbul

Andropadus latirostris

French: Bulbul à moustaches jaunes **German**: Gelbbartbülbül **Spanish**: Bulbul Sibá

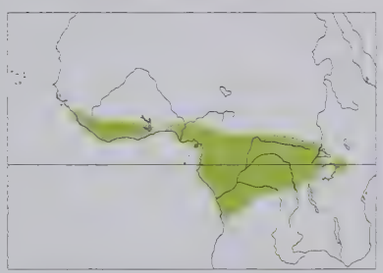
Taxonomy. *Andropadus latirostris* Strickland, 1844, island of Bioko (Fernando Póo), Equatorial Guinea.

Genus formerly submerged in *Pycnonotus*. Isolated population on Ufipa Plateau, in Tanzania, named as *australis*, is considered a synonym of nominate; conversely, has been proposed as a sibling species on basis of its paler underparts and, in particular, vocal differences. Other described races are *saturatus* (R Honi, in Kenya) and *eugenius* (W shore of L Victoria, in NW Tanzania), both poorly differentiated and also synonymized with nominate. Two subspecies recognized.

Subspecies and Distribution.

A. l. congener Reichenow, 1897 – SW Senegal and W Guinea E to SW Nigeria (W of R Niger).

A. l. latirostris Strickland, 1844 –SE Nigeria and Bioko I E to extreme S Sudan and C Kenya, S to N Angola, SC DRCongo and N Burundi, also N, NW & W Tanzania (Loliondo; Kigoma S to Kungwe-Mahare Mts; Ufipa Plateau).



Descriptive notes. c. 17 cm; male 25–35 g, female 23–32 g (nominate), male 24–31 g, female 12·5–25 g (*congener*). Medium-sized greenbul with distinctive yellow throat stripes. Nominate race has head and upperparts dark olive-green, bright yellow stripe on each side of throat; uppertail-coverts and tail dark reddish-brown, wings dark greenish-olive; centre of throat yellowish olive-green, underparts dull olive-green, flanks somewhat browner, centre of lower breast and belly pale yellow, undertail-coverts pale brown; iris dark brown, brown or grey-brown; bill black or dark brown, yellow cutting edges, tip and gape; legs distinctively orange-brown, yellow-brown or brownish-flesh. Sexes alike, female smaller (virtually no overlap in wing-length measurements of sexes in Kenyan Highlands). Juvenile resembles adult, but upperparts washed reddish, underparts dull brown, no malar stripes, basal half of lower mandible yellow, legs pinkish, bright orange or orange-yellow; malar stripes develop progressively, narrow at first, area of full extent intially dark. Race *congener* is slightly smaller than nominate, darker and greyer above, tail very dark, duller and greyer below, centre of belly whitish-yellow. Voice. Song a monotonous series of c. 12 "chruk" notes, slightly increasing in volume, repeated seemingly incessantly with pause of 5–30 seconds pause between each repetition; otherwise rendered "chuk, chik, chuk, chup, chik, tsup, chik-chik-chik tsuk, chik-chik-tsuck". Calls include repeated "chuk", rapid scolding "ditditditditdit" or "tip-tyip-tyip-tyip". Vocalizations of isolated Ufipa Plateau (Tanzania) population apparently highly distinctive, "zik, zik, zik, zik, zik, zik, zik" and monosyllabic "djeurr".

Habitat. Occupies both interior and edge of all types of primary and secondary forest, gallery forest, forest–savanna mosaic, thicket and large gardens; readily enters dense regrowth of abandoned cultivation, overgrown plantations, and regenerating logged forest. Sea-level to 1500 m in Liberia, to 1600 m on Bioko, 2200 m in Cameroon, 2300 m in DRCongo, 2700 m in Sudan, 3000 m in E Africa.

Food and Feeding. Fruit, including berries, and arils, also many arthropods; gastropods and small vertebrates (frogs, geckoes) also recorded as eaten. Fruit, berries and arils include those of *Agalaea*, *Allophylus*, *Bridelia*, *Capsicum*, *Cissus*, *Coelocaryon*, *Dacryodes*, *Ficus*, *Galiniera*, *Harungana*, *Heisteria*, *Ilex*, *Pycnanthus*, *Maesa*, *Morinda*, *Musanga*, *Ocotea*, *Sapium*, *Schleffera*, *Solanum*, *Trema*, *Tricalysia*, *Urera*, *Vitis*. Arthropods taken include orthopterans, mantids, flies (Diptera), beetles (Coleoptera), moths (Lepidoptera), caterpillars, ants (Hymenoptera), alate termites (Isoptera), spiders (Araneae), woodlice (Isopoda). Generally solitary, but will congregate with others, as well as with other pycnonotids, at fruiting trees; regularly attends *Dorylus* ant swarms, but otherwise rarely joins mixed-species parties. Usually shy and hard to see. Forages at all strata, but mainly at lower levels, below 5 m, ascending to lower canopy to visit crowns of fruiting trees. Prefers thin horizontal perches. Gleans insects from the ground, among fallen logs, etc., sometimes digging; frequently makes horizontal sallies to take insects from foliage, trunks and stems and lianes, and from the air. Hovers to pluck fruit. In intraspecific disputes, rivals raise the yellow malar stripes, make buzzy notes and chase each other.

Breeding. Nesting recorded in Oct–Mar (mainly Nov–Dec, in early dry season) in Liberia, May in Nigeria, May–Aug (and birds in breeding condition Feb–Oct) in Cameroon, Dec–Apr in Gabon, Jan, Mar and Sept–Nov in Rwanda, Jan–Feb and May–Jul in Sudan, Jan, Apr–May, Jul and Sept–Nov in Uganda, and Oct and Dec in Kenya; birds in breeding condition in Jun in Central African Republic, throughout year (peak in rains) in DRCongo, and Oct (immature seen in Feb) in Angola. System varies regionally: in some areas (usually where densities high) polygamous and non-territorial, uses leks and may be co-operative breeder; in parts of range where less abundant, e.g. Kenya, monogamous and territorial, remaining on territory in successive years, mean territory size 1·3 ha. In Gabon, males assemble during singing period (Sept–Apr) and sing in chorus at "traditional lekking sites" 100–200 m long, 40–50 m wide, often along roads or rivers, distance between leks 600–1200 m; male chooses songpost in dense undergrowth (from near ground level to canopy), space between singers may be only 10–20 m, males at centre of lek tend to large and heavy (perhaps dominant individuals); male defends area of c. 20 m in diameter, if intruder is female he displays towards her, with yellow moustaches prominent, rapidly beating wings drooped and somewhat curved, tail lowered and spread; females non-territorial, nests to within 2–3 m and in full view of each other, such nests often synchronized, several males may together defend a threatened nest. Nest constructed in 14 days (can be rebuilt in 5 days for second brood), a loosely built cup, outer layer of twigs, rootlets, strips of bark and plant fibres, inner layer of dry leaves, often bound together with cobwebs and hyphae of *Marasmius* fungus, lining of fine rootlets, dry grass or *Marasmius*, external diameter 9–12 cm, internal 5–8 cm, external depth 4–7 cm and cup depth 3–4 cm; placed 0·3–1·9 m above ground in dense undergrowth, often in fork of small bush or sapling and attached by means of vine tendrils. Clutch 1–4 eggs, usually 2; incubation by female only, period not documented; chicks fed by female alone in lek system, otherwise by both parents, nestling period 12–15 days; young largely independent on leaving nest, do not follow parents. Breeding success varies widely, with 45–85% (mean 75%) lost to predation annually; in Gabon, after two years in which no reproduction took place (possibly as anti-predator strategy), predation levels in third year (when breeding resumed) fell to 46% and population increased by 50%, but in succeeding four years nest predation rose to 78%.

Movements. Sedentary in some areas, nomadic in others. Mainly nomadic in areas where lek system used; in Gabon, 90% of population wanders and, of 791 individuals ringed, only 82 were retrapped. Recapture rates higher in other areas, e.g. Ogba Forest (Nigeria), where considered sedentary; sedentary individuals appear to have very small ranges, mostly recaptured where ringed. Reasons for sedentary behaviour by minority unclear; not thought related to age, sexual activity or physical condition. An altitudinal migrant on Mt Kupé, in Cameroon; absent above 1300 m in Apr–Sept, but occurs to 1950 m in dry season, though always less common above 1300 m.

Status and Conservation. Not globally threatened. Generally common to abundant throughout its wide range; often the most numerous bulbul, and sometimes the most abundant bird species, in many forests. Total population in Liberia thought to number at least 1,000,000 pairs. Density very variable, e.g. in Gabon estimated at up to 500 birds/km², in Nigeria at 1 bird/0·7 ha. Recently recorded for first time in Benin. Occurs in numerous national parks and other protected areas throughout its range, from Sapo National Park, in Liberia, E to Bwindi-Impenetrable Forest National Park, in Uganda, and S to Lopé National Park, in Gabon, and Kahuzi-Biéga National Park, in DRCongo.

Bibliography. van den Akker (2003), Bannerman (1936, 1953), Barlow *et al.* (1997), Bennun (1994), Borrow & Demey (2001), Bowden (2001), Britton (1972, 1980), Brosset (1971a, 1981a, 1981b, 1981c, 1982), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett (1990), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool *et al.* (1994a), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Heyman & Morlion (1980), Jackson & Sclater (1938), Johnson, D.N. (1989), Keith *et al.* (1992), Larison *et al.* (2000), Lens *et al.* (1996), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Mattes & Gatter (1989), Morel & Morel (1990), Nikolaus (1987, 1989), Payne (1984), Pérez del Val (1996), Prigogine (1971, 1978, 1984), Ripley & Heinrich (1966), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Selempo (1994), Smith *et al.* (1996), van Someren (1956), Stevenson & Fanshawe (2002), Thiollay (1985), Turner & Zimmerman (1979), Willis (1983), Zimmerman (1972), Zimmerman *et al.* (1996).

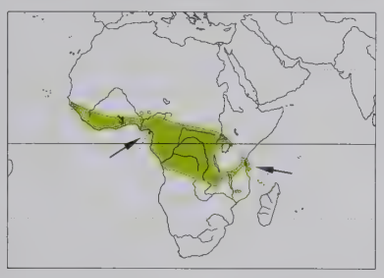

ssp virens
ssp zombensis
55
ssp erythropterus
ssp insularis
ssp importunus
56
57
ssp hypoxanthus
ssp leucurus
ssp indicator
♀
♂
58
59
60
61
ssp laetissima
ssp schoutedeni
62
PLATE 19
inches 3
cm 8
ssp centralis
ssp flaviventris
63
ssp occidentalis
64
65
ssp flavicollis
66
ssp soror
ssp flavigula
67

55. Little Greenbul

Andropadus virens

French: Bulbul verdâtre **German**: Grünbülbül **Spanish**: Bulbul Verde
Other common names: Little Green Bulbul; Hall's Greenbul ("*A. hallae*")

Taxonomy. *Andropadus virens*, Cassin, 1857, Cape Lopez and River Muni, West Africa.
Genus formerly submerged in *Pycnonotus*. Affinities unclear; may be closest to *A. latirostris*, to which it bears some resemblance in several aspects of behaviour. Described taxon *A. hallae*, known only from the single type specimen (from E DRCongo), now considered a melanistic form of present species. Race *amadoni* originally named as *poensis*, but that name preoccupied by "*Stelgidillas poensis*", a synonym of *A. gracilirostris*. Proposed race *holochlorus* (from R Sezibwa, in Uganda) is on average yellower below and slightly larger than nominate, but much individual variation and intergradation, and considered better merged with latter; similarly, *marwitzi* (Mt Kilimanjaro, in Tanzania) is poorly differentiated, merged with *zombensis*. Five subspecies currently recognized.
Subspecies and Distribution.
A. v. erythropterus Hartlaub, 1858 – Gambia E to E Nigeria.
A. v. amadoni Dickerman, 1997 – Bioko I.
A. v. virens Cassin, 1857 – W Cameroon E to extreme S Sudan and W Kenya, S to N Angola and S DRCongo.
A. v. zombensis Shelley, 1894 – SE DRCongo, N Zambia, N & SE Malawi, SE Kenya, Tanzania (Eastern Arc mountains, also Mafia I) and CN Mozambique.
A. v. zanzibaricus (Pakenham, 1935) – Zanzibar.



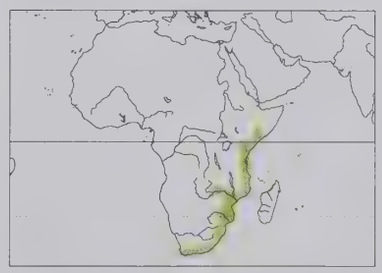
Descriptive notes. c. 16·5 cm; male 21–32 g, female 22–30 g. A small, uniformly plumaged greenbul, lacking any contrasts in plumage. Nominate race has head and upperparts, including wings, dark olive-green, uppertail-coverts and tail brown with brownish wash; eyering very indistinct or absent; throat pale olive-green, breast and flanks dark olive, centre of belly pale yellow, undertail-coverts pale brown; iris dark brown or grey-brown; bill black or dusky, yellow gape (sometimes lacking); legs yellowish-brown or yellowish-orange. Distinguished from *A. curvirostris* by lack of contrasting eyering, also by voice. Sexes alike, female on average smaller than male. Juvenile differs from adult in having wings browner, upperwing-coverts and secondaries with rusty wash, yellow of belly paler and less extensive, lower mandible, tip of upper mandible and gape yellow. Race *erythropterus* is greyer and darker above than nominate, with browner flight-feathers, less yellow on belly; *amadoni* is greener above and somewhat brighter yellow below than nominate; *zombensis* is more grey-green above and paler overall, including olive of underparts and yellow of belly; *zanzibaricus* is less green and darker above than previous, also greyer and less yellow below. Voice. Song, from well-concealed perch 2–3 m above ground, given relentlessly all day and for most of year, starts with a few subdued chuckling notes, succeeded by rapidly ascending series, forming pleasant bubbling warble, increasing in volume, ending on high, clear, rising note, "kwirk kwirk kwirk…chwukawuk-cherchickalee-chuck-chuk-chuk-tuwerrtlii-tuk-tuk-twee". Call a dry "kuk-kuk-kuk".
Habitat. Forest of all types, including primary and secondary evergreen and semi-deciduous forest, gallery forest, forest–savanna mosaic, swamp-forest, mangroves and riparian thicket, even gardens. Shows marked preference for secondary and edge habitats; in many places does not penetrate far inside high forest, and where it does may be in areas where *A. latirostris* less common (e.g. parts of Gabon). Sea-level to 1500 m in Liberia, to 2200 m in Cameroon, 1830 m in DRCongo, 1850 m in E Africa and 2050 m in Zambia.
Food and Feeding. Fruit, including berries, also many arthropods; may be largely frugivorous only seasonally. Fruits taken include those of *Allophylus*, *Asparagus*, *Cleistochlamys*, *Clidemia*, *Ficus*, *Lantana*, *Macaranga*, *Maesopsis*, *Musanga*, *Ochthocosmus*, *Polysphaeria*, *Rhus*, *Solanum*, *Sorindea*, *Tapinanthus*, *Trema*, *Xylotheca*. Arthropods taken include orthopterans, mantids, neuropterans, dipterans, beetles (Coleoptera), bugs (Hemiptera), ants (Hymenoptera), alate termites (Isoptera), spiders (Araneae). Found singly or in pairs; not gregarious, although several may gather at a fruiting tree, including with other bulbul species. Rarely joins mixed-species parties. Shy and skulking; forages mainly within thick cover, usually below 10 m, and down to ground level, particularly when attending *Dorylus* ant swarms. Will catch insects in flight over short distances, sometimes hovering briefly; also gleans from bark and leaves.
Breeding. Nesting recorded in Jun–Jul in Senegambia, Sept–Oct and Dec in Liberia, Feb and Apr–May in Ghana, Jan–Mar in Cameroon, Oct–Mar (especially Jan–Feb short dry season) and occasionally Jul–Aug (when short dry season late) in Gabon, Nov–Dec in PRCongo; in DRCongo, all year near equator and all months except Jun–Aug (short dry season) at Itombwe; Aug–Sept in Sudan, Jan–May and Sept–Oct in Uganda and W Kenya, Oct–Nov in Malawi, and May and Jul–Nov in Zambia; birds in breeding condition May–Jun and Sept in Nigeria, Mar–Sept (also juveniles Feb–Jul, breeding throughout year suspected) in Cameroon, Jan and Aug (juveniles in May) in Angola and Nov–May in coastal Tanzania. Territorial. Groups of 6–10 singing males recorded as collecting seasonally in small areas, may be related to breeding behaviour, but these areas (in contrast to leks of *A. latirostris*) differ from year to year; singing male beats wings, lowers tail and head, and puffs out feathers of throat and body; in probable pre-copulatory behaviour, presumed male sang from perch while presumed female flew silently between adjacent branches, and rapidly fluttered her wings while perched. Nest a shallow cup of dead leaves, twigs and bark fragments, sometimes bound with cobwebs and strips of bark, lined with plant fibres, fine rootlets and grasses and hyphae of *Marasmius* fungus, external diameter 10–11·5 cm, internal 6·5 cm, external depth 7 cm and cup depth 2–3·5 cm; placed low down, from just above ground to 1·5 m, in small shrub or fern tangle or under large leaves, suspended from twigs. Clutch 2 eggs, sometimes 3; incubation by female only, period at least 13 days; fledging period 11–12 days. In Gabon, 60% of nests preyed on.
Movements. Resident; some local wandering, e.g. of 114 birds ringed in Gabon only one retrapped (twice, after 8 and 23 months). Some evidence of altitudinal migration in Cameroon; during wet season on Mt Kupé, absent above 1400 m and scarce above 1100 m.
Status and Conservation. Not globally threatened. Extremely common across almost all of its extensive range. Total population in Liberia thought to be at least 4,000,000 pairs. Densities vary greatly; estimated 1 bird/2·5 ha in Nigeria, 2–6 pairs/10 ha locally in Malawi; in Tanzania, 444 individuals/100 ha in Udzungwa Mts, and in another study in Eastern Arc mountains reported maximum density c. 150 birds/km². Occurs in numerous national parks and other protected areas throughout its range, from Sapo National Park, in Liberia, E to Bwindi-Impenetrable Forest National Park, in Uganda, and S to Lopé National Park, in Gabon, and Kahuzi-Biéga National Park, in DRCongo. Given this species' preference for secondary habitats, its future seems assured.
Bibliography. Bannerman (1936, 1953), Barlow *et al.* (1997), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Bowden (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Carswell (1986), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1994), Dickerman (1994, 1997), Dinesen (1997), Dowsett (1985a), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1989, 1996), Dowsett-Lemaire & Dowsett (1991, 2004), Elgood *et al.* (1994), Fishpool *et al.* (1994a), Gatter (1997), Germain *et al.* (1973), Gore (1990), Grimes (1987), Hall & Moreau (1970), Heyman & Morlion (1980), Jackson & Sclater (1938), Jensen & Brøgger-Jensen (1992), Johnson, D.N. (1989), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Mlingwa (1993), Mlingwa & Bairlein (1998), Morel & Morel (1990), Moyer (1993), Nikolaus (1987, 1989), Pakenham (1979), Pérez del Val (1996), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Romdal (2001), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985), Turner & Zimmerman (1979), Waltert & Mühlenberg (1999), Willis (1983), Zimmerman (1972), Zimmerman *et al.* (1996).

56. Sombre Greenbul

Andropadus importunus

French: Bulbul importun **German**: Schlichtbülbül **Spanish**: Bulbul de Zanzibar
Other common names: Southern Sombre Greenbul (*importunus*); Zanzibar Sombre Greenbul (*insularis*); Frick's Sombre Greenbul ("*A. fricki*")

Taxonomy. *Turdus importunus* Vieillot, 1818, Outeniekwa Forest, Western Cape, South Africa.
Genus formerly submerged in *Pycnonotus*. Affinities of this species uncertain; no obvious close relatives, and generic placement by no means certain. Proposed taxon *A. fricki* (described from C Kenyan Highlands), resembling race *insularis* but with yellow eyering, now considered to be immature of that race. Size (weight) increases clinally from Kenya S to South Africa. Several proposed races too poorly differentiated to be safely distinguishable: thus, *somaliensis* (S Somalia) and *subalaris* (coastal Kenya) merged with *insularis*, *loquax* (SC Mozambique) with *hypoxanthus*, and *noomei* (NE South Africa) and *errolius* (E South Africa) with nominate. Four subspecies recognized.
Subspecies and Distribution.
A. i. insularis Hartlaub, 1861 – extreme S Ethiopia and S Somalia S to coastal C Tanzania (including Zanzibar).
A. i. hypoxanthus Sharpe, 1876 – coastal SE Tanzania (including Mafia I) S to Mozambique (N of R Save), and SC Zambia and Malawi S to Zimbabwe (except along R Limpopo).
A. i. oleaginus W. K. H. Peters, 1868 – S Zimbabwe (along R Limpopo), S Mozambique (S of R Save) and lowland N South Africa (S to N KwaZulu-Natal) and E Swaziland.
A. i. importunus (Vieillot, 1818) – highlands of N South Africa and W Swaziland S along coast to Western Cape.



Descriptive notes. 15–17·5 cm; male 25–30 g, female 22–27·5 g (*insularis*), male 26–40 g, female 24–33 g (other races). A medium-small, plain, pale-eyed greenbul. Nominate race has head and entire upperparts, including wings and tail, dark olive-green; throat and underparts uniform olive-grey, slightly paler on belly; iris white or pale yellow; bill black or slaty; legs black, slaty, grey or dark olive-brown. Sexes alike, female on average smaller than male. Juvenile is as adult, but brighter yellow below, olive-green wash across breast, richer olive-green above; bare-part development gradual, orange gape, brown iris and yellow eyering for first 3 months, by 6–9 months these all yellowish, at 9–12 months very faint yellowish gape, yellow iris and vestigial eyering, at 12–24 months as adult. Race *insularis* is slightly smaller than nominate, paler overall, with brownish-olive upperparts, tail somewhat darker, pale brownish-olive below, belly pale yellow, undertail-coverts pale yellow-brown; *oleaginus* has upperparts somewhat paler than nominate, throat, upper breast and flanks yellowish olive-grey, lower breast to undertail-coverts deeper, richer yellow; *hypoxanthus* resembles previous, but greener above, brighter yellow below. Voice. Loud and persistent vocalizations given throughout year, during breeding season virtually throughout day. Race *insularis* (Kenya) song includes short, rapid, slurred "chwelee-tuweeueet-tuweeuleet", rising at end, also "we-up-tchup-cheu-tew-wééa"; usual call note "cheeerurip" or "wheerúp" with emphasis on final syllable. In nominate race (South Africa), contact call a penetrating, rather ringing "willie"; song consists of "willie" call note followed by rapid jumble of equally loud notes, ending with either wheezing note or, more usually, downslurred whistle, transliterated as "willie, come and have a fight, sca-a-a-ared". Loud, excited "plee-plee-plee-plee" possibly an alarm call.
Habitat. Dense coastal scrub, thicket and forest, extending inland in riverine bush and forest; also occupies other types of bush, scrub and woodland, e.g. thickets in thornveld. In South Africa ascends mountain slopes along wooded valleys to reach evergreen forest in mist belt; in Mozambique in riparian reedbeds; in Kenya penetrates to 1220 m in the Chyulus and to 2000 m in S fringes of C Highlands; in Zambia to 1300 m, mainly below 600 m. Prefers natural vegetation, but occurs in various parts of its range in overgrown cultivation, woodlands of exotic trees, and gardens in well-wooded suburbs.
Food and Feeding. Mostly berries and other fruit, including *Bryoscarpus*, *Chassalia*, *Commiphora*, *Cyphostemma*, *Englerina*, *Ficus*, *Harrisonia*, *Hoslundia*, *Landolphia*, *Lantana*, *Ozoroa*, *Passiflora*, *Phyllanthus*, *Polysphaeria*, *Premna*, *Protea*, *Rhus*, *Securinega*, *Uvaria*. Arthropods and small gastropods also taken. Found singly or in pairs; sometimes larger flocks in non-breeding season. For-

On following pages: 57. Golden Greenbul (*Calyptocichla serina*); 58. Honeyguide Greenbul (*Baeopogon indicator*); 59. Sjöstedt's Greenbul (*Baeopogon clamans*); 60. Spotted Greenbul (*Ixonotus guttatus*); 61. Joyful Greenbul (*Chlorocichla laetissima*); 62. Prigogine's Greenbul (*Chlorocichla prigoginei*); 63. Yellow-bellied Greenbul (*Chlorocichla flaviventris*); 64. Falkenstein's Greenbul (*Chlorocichla falkensteini*); 65. Simple Greenbul (*Chlorocichla simplex*); 66. Yellow-throated Greenbul (*Chlorocichla flavicollis*); 67. Swamp Palm Bulbul (*Thescelocichla leucopleura*).

ages by clambering through foliage in canopy, occasionally feeding in undergrowth or on the ground among leaf litter in low scrub. Shy and inconspicuous, keeping to dense cover, usually in canopy of forest or thicket, but inquisitive, emerges at intervals to sing from top of bush or exposed branch; dives quickly into cover when alarmed. Occasionally hawks aerial insects.
Breeding. Nesting recorded in Apr–Oct and Dec in Kenya, Jan, Mar, May and Oct (birds in breeding condition Nov–Dec and Feb) in Tanzania, in Zanzibar mainly Sept–Jan but also May–Jun; Aug–Feb and Apr in Malawi, Sept, Nov and Mar in Zambia, Sept–Apr (mainly Nov–Dec) in Zimbabwe and KwaZulu Natal; in South Africa, Jul–May in Eastern Cape and Sept–Apr in Western Cape, but mainly Oct–Nov in both provinces; at least some females double-brooded. Monogamous. Solitary nester, territorial. During pre-mating courtship display, partners faced each other on horizontal branch, male rapidly raising and lowering head in elliptical arc, periodically rotating slowly in complete turn while still head-bobbing, all the time with feathers of crown and nape raised, rapidly quivering slightly opened wings, and uttering soft keening call, female also bobbed head (out of phase with male), uttering same call. Nest built by female alone, usually a rather flimsy and thin-walled, shallow open cup made of fine stems of dry grass, twigs, rootlets, lichen and other plant fibres, lined with finer grasses, rootlets, other fine plant fibres, sometimes hair, external diameter 10–11 cm, depth 5–8 cm, internal diameter 5–6 cm and depth 3·7–4 cm; placed 1–4 m, usually 1·5–2·5 m, up and attached by cobwebs in fork of main stem of thickly foliaged slender tree or shrub, or at end of branch (then supported by foliage), often one somewhat isolated from others. Clutch 1–3 eggs, usually 2; incubation by female, male seen to bring food to her, period 12–17 days; chicks fed by both parents, at some nests brooded only by female, at others by both adults, nestling period 10·5–16 days; young fed for c. 3 weeks after leaving nest. Average of 1·73 chicks fledge per successful nest.
Movements. Sedentary; in S Africa, most ringed individuals have been recovered at original ringing sites for up to 10 years, with greatest movement 34 km. Flocks may wander locally in search of fruit during non-breeding season.
Status and Conservation. Not globally threatened. Generally common to abundant through much of its extensive range. Estimated densities of 21 birds/100 ha in acacia (*Acacia*) woodland in S Mozambique, where population for the region thought to exceed 100,000 individuals; densities in Swaziland estimated at 2 birds/100 ha in acacia savanna, 38 birds/100 ha in broadleaf woodland and 92 birds/100 ha in riverine forest. Adaptable; able to thrive in variety of habitats, including secondary ones. Well represented in protected areas.
Bibliography. Ash & Miskell (1983, 1998), Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brown & Britton (1980), Clancey (1964, 1996), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire & Dowsett (2004), Ginn *et al.* (1989), Hall & Moreau (1970), Hanmer (1978, 1984), Harrison *et al.* (1997), Irwin (1981), Jackson & Sclater (1938), Keith *et al.* (1992), Leonard, P.M. (1998), Lewis & Pomeroy (1989), Lloyd (2005d), Longrigg (1978), Mackworth-Praed & Grant (1960, 1963), Maclean (1993), Mlingwa (1993), Mlingwa & Bairlein (1998), Monadjem (2001b, 2002b, 2003), Oatley (2005), Pakenham (1979), Parker (1999), Stevenson & Fanshawe (2002), Tarboton (2001), Turner & Zimmerman (1979), Urban & Brown (1971), Vincent (1947), Zimmerman *et al.* (1996).

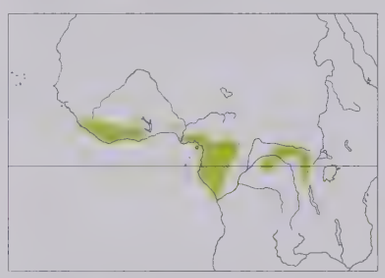
Genus *CALYPTOCICHLA* Oberholser, 1905

57. **Golden Greenbul**

Calyptocichla serina

French: Bulbul doré **German**: Goldbülbül **Spanish**: Bulbul Dorado
Other common names: Serine Greenbul

Taxonomy. *Criniger serinus* J. Verreaux and E. Verreaux, 1855, Gabon.
Distinctive species, with no obvious close relatives. Monotypic.
Distribution. Sierra Leone and SE Guinea E to Togo, and SW Nigeria E to SW Central African Republic and S, including Bioko I, to W PRCongo and N Angola (Cabinda), also extreme W and parts of NC, NE & E DRCongo.



Descriptive notes. c. 18 cm; male 36·4–42 g, female 35–42·5 g. A medium-sized greenbul with distinctive golden coloration and pale bill. Plumage is wholly yellowish olive-green above, including tail and wings, brightest on rump; lores and ear-coverts yellowish-olive, some indistinct paler streaking on ear-coverts; chin and upper throat whitish, lower throat yellow, breast and flanks yellowish-green with some paler yellow shaft streaking, lower breast, belly and undertail-coverts bright golden-yellow; iris dark grey, brown or pale grey-brown; bill pale pinkish or light brown, tip darker, base of lower mandible whitish; legs grey, olive-grey, dark blue, greenish-blue or dull dark red. Sexes alike, female on average smaller than male. Juvenile resembles adult but duller below, throat pale yellow. Voice. Song, given only during nesting period, a short, clear "tiup-chiweew", stress on last syllable; many variations, some introducing third note, "wep-chep, wep-chep", "whit-tu-tiup", "tiu-tu-tip", "tchu tchi-tyu" and similar. Calls include short "tsip" or "tyip" and, in flight, thin, high-pitched "see".
Habitat. Evergreen and semi-deciduous forest, both primary and secondary, isolated forest patches; often in edge habitats. Enters cacao plantations and forest in later stages of regeneration on abandoned farmland; favours young secondary *Sarcophyrnium* forest and secondary growth of Burseraceae and Myristicaceae in Gabon. Sea-level to 1200 m in Liberia, to 1300 m in Cameroon.
Food and Feeding. Fruit, including *Ficus*, *Heisteria*, *Macaranga*, *Morinda*, *Ochthocosmus*, *Rauwolfia*, *Xylopia*, and small seeds. Also insects, including orthopterans, alate termites (Isoptera) and caterpillars. Occurs singly, in pairs or in small family parties; sometimes joins mixed-species flocks. Forages largely in emergent trees, in canopy and subcanopy, usually above 20 m, occasionally coming lower to fruiting bushes; often calls from canopy while sitting erect. Often seen in fruiting trees with *A. gracilirostris*. Gleans insects from leaves; makes aerial sallies after alate termites.
Breeding. Nesting recorded in Mar and Apr in Cameroon, Dec–Feb (and birds in Breeding condition in Sept) in Gabon, and Jan and Nov in DRCongo; in breeding condition in Aug in Nigeria; fledgling being fed by adults in Mar in Liberia, and begging juveniles in Mar and immature in May in Ivory Coast. Territorial; displays of aggressive behaviour during nesting season. Nest built by female, attended by singing male, made of dry leaves and plant fibres, placed in fork surrounded by leaves at end of horizontal branch 30–40 m above ground in tree crown. Clutch size unrecorded; incubation by female only, young fed by both parents.
Movements. Highly mobile, thought to be nomadic over large areas.
Status and Conservation. Not globally threatened. Widespread, but nowhere particularly common. Density in Gabon estimated at 10–12 individuals/km². Occurs in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Cross River, in Nigeria, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, and Salonga, in DRCongo.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Britton (1972), Brosset (1971a), Brosset & Érard (1986), Chapin (1953), Chappuis (1975), Chappuis & Érard (1993), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire (1996), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Pérez del Val (1996), Prigogine (1971, 1978, 1984), Rainey & Lachenaud (2002), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Thiollay (1985).

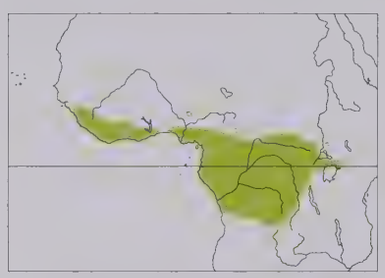
Genus *BAEOPOGON* Heine, 1860

58. **Honeyguide Greenbul**

Baeopogon indicator

French: Bulbul à queue blanche **German**: Weißchwanzbülbül **Spanish**: Bulbul Indicador

Taxonomy. *Criniger indicator* J. Verreaux and E. Verreaux, 1855, Gabon.
Proposed race *togoensis* (E Ghana and Togo) considered not satisfactorily distinguishable from *leucurus*. Two subspecies recognized.
Subspecies and Distribution.
B. i. leucurus (Cassin, 1855) – W Guinea E to Togo.
B. i. indicator (J. Verreaux & E. Verreaux, 1855) – SW & C Nigeria (including isolated population on Jos Plateau) E to extreme S Sudan and W Kenya, S to N Angola, S DRCongo and extreme NW Zambia.



Descriptive notes. c. 19 cm; male 44–53 g, female 40–48 g. A stocky, medium-sized greenbul with pale eyes, mostly white outer tail feathers (flashed conspicuously in flight, possibly as intraspecific recognition signal). Male nominate race has lores, cheeks and ear-coverts uniform grey, washed olive; top of head and upperparts, including wings, greenish-olive, slightly darker on crown and greyer on nape; central two pairs of tail feathers blackish, third pair (T3) blackish on inner web and on terminal 2 cm or so of outer web, remainder of outer web white, outer rectrices (T4–T6) white with creamy edges and dark tips, latter becoming progressively narrower outwards (down to c. 7 mm on outermost); throat grey, breast and flanks dark olive-grey, lower breast, centre of belly and undertail-coverts creamy buff; iris white, creamy or greyish-white; bill black or dark grey; legs grey or slate. Differs from *B. clamans* in having grey (not buffy) breast, throat concolorous with breast, white outer tail feathers tipped dark, pale eye. Female is on average smaller than male, differs also in having eyes brown to grey. Juvenile resembles adult, but duller above, belly grey-white, outer three pairs of tail feathers wholly white, dark tip of T3 much less extensive, eyes of young male dull greyish-buff. Race *leucurus* is greyer, less olive, below than nominate, belly and undertail-coverts brighter, creamy white, and (contrary to published statements) both sexes have eyes creamy white. Voice. Distinctive; main song a clear, vigorous turdid-like whistle comprising a series of 8–10 melodious notes, the last extended and descending, "keerriup keeup kuileep turee tzeeeeew", often abbreviated to rapid "vik-vik-viiieew" or "tiu-liuuw". Also single mewing note, "teeueeep" or "squeeeeueee".
Habitat. Evergreen and semi-deciduous forest, both primary and secondary, gallery forest; fond of edges and clearings, treefall gaps, second growth with *Musanga* along logging roads, isolated forest patches, and strips left beside swampy areas in cultivation, cacao plantations, etc. Mainly lowlands, but recorded to 1000 m in Liberia, 1700 m in DRCongo, 1460 m in Zambia and 2000 m in E Africa.
Food and Feeding. Berries and other fruit, including *Ficus*, *Croton*, *Heisteria*, *Macaranga*, *Musanga*, *Rauwolfia*, *Trema*, *Xylopia*. Also arthropods, including beetles (Coleoptera), caterpillars, ants (Hymenoptera), alate termites (Isoptera) and spiders (Araneae). Found singly, in pairs, or in small family groups of up to seven individuals; sometimes joins mixed-species flocks. Forages mainly in upper strata, from 10 m to canopy, occasionally lured down to 5 m by fruiting bushes, and sometimes to isolated trees and bushes some way from forest edge. Restless, active and often vocal for much of day. Seeks insects in tree canopies, leafy tangles, lianes and similar, sometimes gleaning them from leaves by hovering. Infrequently attends doryline ant swarms, then catching prey on the wing or snatching items from stems and trunks.
Breeding. Nesting observed in Jun (but thought to breed most of year) in DRCongo and Nov in Gabon; nest-building recorded in Mar in E Africa; birds in breeding condition in Feb in Sierra Leone, Nov–Dec and Feb (and independent juvenile in Mar) in Liberia, Feb (and nest-building in Aug) in Ghana, Sept–Mar in Nigeria, and Dec in Central African Republic; in breeding condition Aug–Nov in Zambia. Territorial, in Gabon defending area estimated at 15–18 ha with displays and vocalizations; territory in Kenya at least 4 ha. Male seen to feed female with berries. Only one nest described, a loosely built cup of dead leaves and twigs, lined with thin yellow plant stems (contrasting with drab colour of exterior), external diameter 7·5 cm, depth 5 cm, internal diameter 5·5 cm and cup depth 4 cm, placed c. 8 m above ground and secured to two small twigs of branch of orange tree near road (and c. 20 m from a building). Clutch presumed 2 eggs, as two chicks recorded in the nest; incubation by female only. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Fairly common and widespread across its range. Estimated densities 4–10 pairs/km² in Liberia and 6–8 pairs/km² in Gabon, and 1 bird/10 ha in Nigeria. Recorded in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in

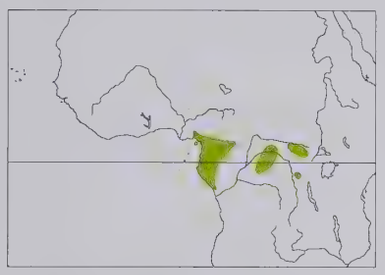
Ivory Coast, Kakum, in Ghana, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, Salonga, in DRCongo, and Kibale Forest, in Uganda.
Bibliography. Bannerman (1936, 1953), Bennun (1994), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975), Chappuis & Érard (1993), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1996), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Gatter (1997), Germain & Cornet (1994), Grimes (1987), Hall & Moreau (1970), Herroelen (1955), Jackson & Sclater (1938), Johnson, D.N. (1989), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Nikolaus (1987, 1989), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985), Turner & Zimmerman (1979), Zimmerman (1972), Zimmerman *et al.* (1996).

59. Sjöstedt's Greenbul

Baeopogon clamans

French: Bulbul bruyant **German**: Sjöstedtbülbül **Spanish**: Bulbul Chillón
Other common names: White-tailed Greenbul, Sjöstedt's Honeyguide Greenbul

Taxonomy. *Xenocichla clamans* Sjöstedt, 1893, Ekundu, Cameroon.
Monotypic.
Distribution. Extreme SE Nigeria S to S PRCongo and E, apparently patchily, to E DRCongo.



Descriptive notes. c. 19 cm. Medium-sized greenbul with conspicuous white outer tail feathers. Forehead is grey-olive, crown to neck olive-green with narrow darker fringed (scaly appearance); lores and ear-coverts grey; upperparts, including wings, bright yellowish-green; central two pairs of tail feathers blackish-brown, third pair (T3) dark on inner web, outer web white except for dark final centimetre or so, three outer pairs wholly white, outer webs broadly edged yellow; chin and upper throat grey, lower throat and side of neck buff (this colour sometimes extending up side of upper throat); breast and upper belly greyish-buff, washed yellowish, flanks grey-olive, lower belly and undertail-coverts rich buff; iris dark reddish-brown or dull red; bill black or dark grey, paler cutting edges and tip; legs grey or blue-grey. Differs from *B. indicator* in having throat colour contrasting with breast, buffy (not grey) breast, no dark tips on white outer tail feathers, eyes dark. Sexes alike, female on average smaller than male. Juvenile is duller than adult, with buffy areas paler. Voice. Emphatic, far-carrying, harsh, nasal "whéw" or "chyaa", or "pyow", much repeated (up to 15 minutes on end) and often running into rapid nasal babble, "teeturuteetutwhee".
Habitat. Primary forest and old secondary forest, particularly near water, along riverbanks and beside small forest streams; mainly in lowlands, reaching 1500 m in DRCongo. Prefers forest interior rather than edge habitats, in contrast to *B. indicator*.
Food and Feeding. Berries and other fruit, including *Heisteria* and *Musanga*. Also insects, such as moths and caterpillars (Lepidoptera), but particularly the immature stages of the small black wasp *Polybioides melaina* and other hymenopterans; young fed exclusively with larvae, pupae and wax from nests of these. Found singly, in pairs or in small groups; sometimes joins mixed-species flocks. Forages from middle level to subcanopy, occasionally lower, gleaning insects from leaves and searching for fruit. Tears apart nests of hymenopterans in order to reach contents.
Breeding. Nesting recorded in Nov–Dec in Cameroon; in Feb (and carrying nest material in Jan) in Gabon, where breeding season suspected as spanning two rainy seasons and intervening dry season; birds in breeding condition in Feb–Mar and Jul in DRCongo. Territorial all year; territory 8–10 ha, defended with song and aggressive displays. Spreads tail to display white outer feathers when calling. Nest a loosely built cup of dead leaves bound together with rootlets and vine stems, suspended hammock-like between small branches and attached by cobwebs, with camouflaging leaves and twigs hanging from underside, attached by hyphae of *Marasmius* fungus; one built 15 m above ground in leaves at end of branch of 25-m tree beside river in small clearing, another at 10 m in a 20-m understorey tree. Clutch size not documented; two young, fully feathered at 15–16 days, fed by female, male watched from nearby and started singing as she approached with food, he approached nest while still singing (female sometimes answered) and waited a few metres from nest while female fed young.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Locally fairly common. Estimated density in Gabon 6–8 pairs/km², similar to that of *B. indicator*. Distribution partially related to that of the wasp *Polybioides melaina*; often found in vicinity of this hymenopteran's large paper nests, which often built close to watercourses. Occurs in a number of national parks, including those of Cross River, in Nigeria, Korup, in Cameroon, Dzanga-Ndoki, in Central African Republic, Lopé, in Gabon, Odzala, in PRCongo, and Salonga, in DRCongo.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Brosset & Érard (1986), Chapin (1953), Chappuis (1975), Christy & Clarke (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Érard (1977), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981, 1984), Mackworth-Praed & Grant (1973), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957).

Genus *IXONOTUS*

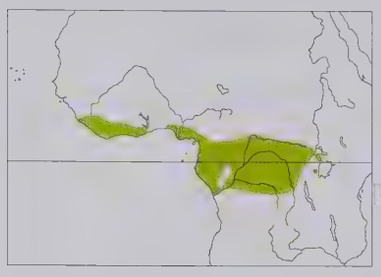
J. Verreaux & E. Verreaux, 1851

60. Spotted Greenbul

Ixonotus guttatus

French: Bulbul tacheté **German**: Fleckenbülbül **Spanish**: Bulbul Moteado

Taxonomy. *Ixonotus guttatus* J. Verreaux and E. Verreaux, 1851, Gabon.
Proposed race *bugoma* (upper DRCongo E to Bugoma Forest, in Uganda), with forehead on average browner, less grey, is considered not satisfactorily distinguishable. Monotypic.
Distribution. Sierra Leone and SE Guinea E to Ghana, and SW Nigeria E to WC & S Uganda and extreme NW Tanzania, S to S PRCongo, N Angola (Cabinda) and SC DRCongo (S as far as Kwango, Kasai, Maniema and Kivu).



Descriptive notes. c 17 cm; male 31–40 g, female 34–38 g. Small greenbul, distinctive in plumage and behaviour. Lores are whitish, periorbital area and ear-coverts grey-brown with some ill-defined paler streaking; top of head and neck greyish-olive with dark feather tips (appearing scaly), mantle and upper back olive; lower back, rump, uppertail-coverts, scapulars, upperwing-coverts and tertials dark olive-brown with large white or yellowish spots at tips; flight-feathers brownish-olive; central two pairs of tail feathers blackish, third pair (T3) with outer web white, inner web blackish, three outer pairs wholly white; chin and throat white, separated from lores by narrow blackish line extending back from gape; underparts, including underwing-coverts, creamy white, tinged yellow, particularly on lower belly and flanks; eye of male brown, red-brown, grey-brown or creamy; upper mandible dark grey, lower mandible grey, pinkish-grey or grey-brown; legs greyish, variable. Female is on average smaller than male, differs also in having eyes pale brown, greyish-white or pale yellow. Juvenile resembles adult. Voice. Distinctive dry chirping or "ticking" call, resembling noise made by electric spark, repeated incessantly; also has double note, "tsi-tsirit", sometimes 3–4 notes together, sometimes single "tsit".
Habitat. Evergreen and semi-deciduous forest, both primary and, less commonly, secondary, also gallery forest, forest–savanna mosaic and cacao plantations. Found both in forest interior and in edge situations, around clearings, etc. Mainly lowlands, but to 1250 m in Uganda and to 1300 in DRCongo.
Food and Feeding. Fruit, particularly figs (*Ficus*), also *Heisteria*, *Macaranga*, *Musanga*, *Ochthocosmus*, *Rauwolfia*; also insects, including caterpillars, alate termites (Isoptera) and ants (Hymenoptera), collected from bark. Nestlings fed with fruit and caterpillars. Most gregarious African bulbul, occurs in monospecific groups of 5–50 (usually 7–15) individuals throughout year. Groups restless, constantly on move, never spending long in one tree, continuously making contact calls; sometimes briefly join other species at fruiting trees, but very rarely with mixed-species flocks. Forages mainly between 10 m and canopy, sometimes lower. Gleans insects energetically from leaves and, especially, from underside of horizontal branches 1–10 cm in diameter; works over branches methodically, peering over one side, then bounding forwards to peer over other side a little way ahead, twisting through c. 70 degrees each time. Will also hover to take prey from beneath a branch. Has distinctive habit, particularly while foraging, of rapidly raising and lowering first one wing and then the other, lifting it towards vertical, bent at "elbow" (white underwing-coverts conspicuous); also flicks tail and fluffs out rump feathers. Several foraging individuals may come together briefly, pausing in groups of up to five, sitting closely side by side, pressed together, each peering around, stretching, flicking tail and one wing, before moving off independently, only to reassemble with same or other individuals farther on.
Breeding. Nesting recorded in Mar–May, Jun and Aug (young in Oct) in Cameroon, and in Dec–Feb, Apr, Jun–Jul and Oct (probably all year) in DRCongo; birds in breeding condition in Aug and dependent young in Sept in Liberia; nest-building in Nov and begging juveniles in Jul–Aug and Oct–Nov in Ivory Coast, and nest-building in Jun–Sept in Nigeria; flying young in Feb and Oct in Gabon. Co-operative breeder, nestling and fledglings fed by group of 4–6 birds. Nest an open, shallow, rounded or oval cup, somewhat frail and crudely constructed from dry leaves, petioles, rootlets and bark fragments, bound together with cobwebs, lined with thin layer of rootlets, external walls decorated with tiny pellets of regurgitated seeds (perhaps for camouflage or strengthening); diameter of round nests 7–7·5 cm externally, 6–6·5 cm internally, oval nests 7·5 × 8·5 cm externally, 6 × 7 cm internally, external depth 2·5–6 cm, cup depth 2–2·5 cm; placed 2·5–8 m above ground in fork of small tree or bush (wild or cultivated), sometimes near a road, once within knot-hole on upper surface of horizontal branch 10 m high in kola nut tree in farmland choked with second growth. Clutch 2 eggs; no information on incubation and nestling periods.
Movements. Uncertain; thought to be sedentary for part of year, nomadic at other times. Largest groups in Gabon in long dry season, when fruiting trees more scattered; groups roam over areas of at least several dozen ha.
Status and Conservation. Not globally threatened. Locally common to scarce across its wide range. Estimated density 1 bird/2 ha in Nigeria. Occurs in numerous national parks, including those of those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Cross River, in Nigeria, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, and Salonga, in DRCongo; also in Budongo Forest, in Uganda.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Carswell (1986), Chapin (1953), Chappuis (1975), Chappuis & Érard (1993), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire (1996), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Gatter (1997), Germain *et al.* (1973), Grimes (1987), Hall & Moreau (1970), Herroelen (1955), Jackson & Sclater (1938), Johnson, D.N. (1989), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Serle (1965b), Stevenson & Fanshawe (2002), Thiollay (1985).

Genus *CHLOROCICHLA* Sharpe, 1882

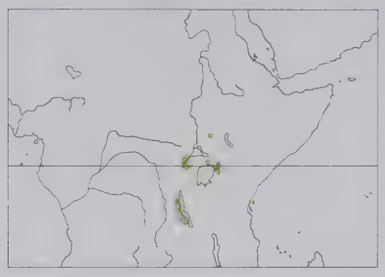
61. Joyful Greenbul

Chlorocichla laetissima

French: Bulbul joyeux **German**: Dotterbülbül **Spanish**: Bulbul Alegre

Taxonomy. *Andropadus laetissimus* Sharpe, 1899, Nandi, Kenya.
May form a species pair with *C. prigoginei*. Two subspecies recognized.

Subspecies and Distribution.
C. l. laetissima (Sharpe, 1899) – extreme S Sudan (Imatong Mts), NE DRCongo (Lendu Plateau S to highlands W of L Edward), W Uganda and SW Kenya.
C. l. schoutedeni Prigogine, 1954 – E DRCongo (Mt Kabobo, Marungu Highlands) and extreme N Zambia (Kasangu).

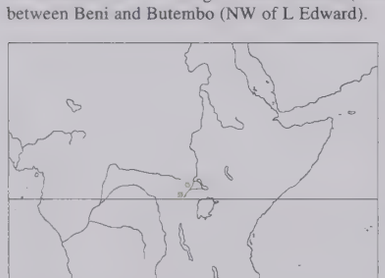


Descriptive notes. 20–21 cm; male 47–54 g, female 43–55 g. A large, distinctive golden-olive greenbul. Nominate race has lores and short stiff feathering around base of upper mandible brownish-yellow, indistinct yellow supercilium and yellow upper eyelid, yellowish-olive cheeks and ear-coverts, rest of head and whole of upperparts bright yellowish-olive, crown feathers dark-centred (appearing scaly at close range); wings feathers dark brown with yellowish olive-green outer webs; tail olive-green, edged yellowish; chin and throat bright yellow, breast and flanks yellow, tinged greenish, belly and undertail-coverts bright yellow; iris bright chestnut, reddish-brown or brown; bill black, cutting edges and tip brown; legs black, blue-grey, greenish-grey or grey-brown. Differs from *C. prigoginei* in larger size, yellow (not white) chin, yellow (not grey) lores and preocular area, absence of contrasting pale eyering. Sexes alike, female on average smaller than male. Juvenile is browner above, greener below. Race *schoutedeni* is darker above than nominate, particularly on neck and side of head, also darker, more olive, on breast and flanks. Voice. Song a boisterous, cheerful, bubbling chatter lasting 4–5 seconds, "chuck-chuck-chweek-kweek-kuardl-chuker-erk-querk"; during courtship, "chukliskéékseu, chwukiliskéékskew" repeatedly. Call a sharp "chik" or "chak".
Habitat. Mid-altitude and montane evergreen primary and secondary forest, gallery forest and isolated forest patches, at 1050–2300 m. Favours more open areas, clearings and edge habitats.
Food and Feeding. Berries and seeds. Nestling of captive pair fed with fruit and "live food", including moth (Lepidoptera). Occurs in monospecific flocks of 4–12 individuals; occasionally joins mixed-species flocks. Forages mainly within lower and middle strata, sometimes in canopy, rarely in undergrowth. Groups vocal and conspicuous; flicks wings while foraging. Two records of flocks accompanied by single *C. prigoginei*.
Breeding. Nesting recorded in Mar in Sudan and Jul in Kenya. Displaying bird pumps tail, droops wings and puffs out throat feathers when singing. No other information from wild. Following details from one pair in captivity: nest an open cup of Spanish moss, rootlets and fine grasses, external depth 6·5 cm; chick almost fully feathered 7 days after hatching, fed by both parents, fully independent by 31 days (but already feeding itself by then).
Movements. No information; probably sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally common; distribution patchy, absent from many seemingly suitable areas. Known from a number of protected areas, including Imatong Mountains Forest Reserve, in Sudan, Okapi Faunal Reserve and Virunga National Park, in DRCongo, Kibale Forest and Mount Elgon National Parks, in Uganda, and Kakamega Nature Reserve, in Kenya.
Bibliography. Bennun (1994), Benson *et al.* (1971), Britton (1972, 1980), Byaruhanga *et al.* (2001), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Everitt (1964a), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Nikolaus (1987, 1989), Stevenson & Fanshawe (2002), Turner & Zimmerman (1979), Zimmerman (1972), Zimmerman *et al.* (1996).

62. Prigogine's Greenbul
Chlorocichla prigoginei

French: Bulbul de Prigogine **German**: Prigoginebülbül **Spanish**: Bulbul de Prigogine
Other common names: Congo/Butembo Greenbul

Taxonomy. *Chlorocichla prigoginei* de Roo, 1967, Maboya, on Upper Luhule River, Kivu, DRCongo.
May form a species pair with *C. laetissima*. Monotypic.
Distribution. NE DRCongo: Lendu Plateau (between Nioka and Djugu) and scattered localities between Beni and Butembo (NW of L Edward).

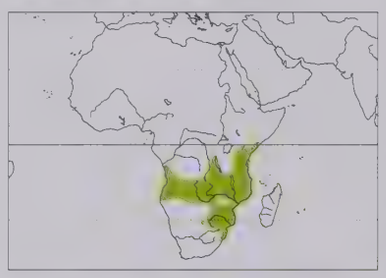


Descriptive notes. 19–20 cm. A medium-sized golden-olive greenbul. Lores and preorbital area are pale grey, feathers short, stiff and forward-pointing; eyering greyish-white, broad and somewhat contrasting; rest of head and whole of upperparts yellowish olive-green, wing feathers dark brown with yellowish olive-green outer webs, tail olive with yellowish olive-green margins; chin white, throat bright yellow; underparts greenish-yellow, side of breast and flanks darker and greener, undertail-coverts yellowish-brown; iris dark red; bill black; legs dull bluish-grey, dark horn or blackish. Differs from similar *C. laetissima* in smaller size, white (not yellow) chin, grey (not yellow) lores and preocular area, pale grey eyering. Sexes alike, female on average smaller than male. Juvenile undescribed. Voice. No information.
Habitat. Isolated forest patches in savanna, gallery forest along upper courses of rivers and thicket, at 1350–1800 m; not found in mature lowland forest.
Food and Feeding. Little information. Stomach of one individual contained seeds, fruit pulp and a caterpillar. One observed alone in understorey. On two occasions, single individual seen with group of *C. laetissima*, once a party of a dozen or so of latter foraging at 1–3 m beside a track, the second a group beside a small stream; on both occasions present species, in contrast to its relative, was silent and undemonstrative, with no wing-flicking. Noted to perch frequently on large leaves of unidentified bush.
Breeding. No information.
Movements. No information.
Status and Conservation. ENDANGERED. Restricted-range species: present in Albertine Rift Mountains EBA. Estimated to number fewer than 10,000 individuals, and to have a range size of only 870 km². Known solely from skins, except for some observations made over a two-day period in 1994 in a forest patch at Djugu (Lendu Plateau). Current status of forest in the Beni–Butembo area is unknown, but likely to be under serious threat from logging and agricultural encroachment. In 1997 only c. 20 ha of forest estimated to remain on the Lendu Plateau, and it is thought that even this may now have gone as a result of encroachment from surrounding villages. None of the localities from which the species has been recorded has any formal protection.
Bibliography. Butchart & Stattersfield (2004), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Demey *et al.* (2000), Dowsett (1985a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Keith *et al.* (1992), Mackworth-Praed & Grant (1973), Pedersen (1997), Prigogine (1985), do Roo (1967), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

63. Yellow-bellied Greenbul
Chlorocichla flaviventris

French: Bulbul à poitrine jaune **German**: Gelbbauchbülbül **Spanish**: Bulbul Pechiamarillo
Other common names: Yellow-bellied Bulbul, Yellow-breasted Greenbul

Taxonomy. *Trichophorus flaviventris* A. Smith, 1834, near Durban, South Africa.
Has in the past been suggested as forming a superspecies with *C. falkensteini*, but subsequent studies have not supported such a relationship. Poorly differentiated race *ortiva* (described from S Mozambique) treated as a synonym of *occidentalis*. Three subspecies recognized.
Subspecies and Distribution.
C. f. centralis Reichenow, 1887 – S Somalia and SC & W Kenya S to E Tanzania and NE Mozambique.
C. f. occidentalis Sharpe, 1882 – NW Angola E to SE DRCongo and W Tanzania, S to extreme NW Namibia, N & E Botswana, N South Africa (S to Northern Province and Mpumulanga) and SC Mozambique.
C. f. flaviventris (A. Smith, 1834) – coastal S Mozambique S to E South Africa (S to KwaZulu-Natal and extreme N Eastern Cape).



Descriptive notes. 20–21·5 cm; male 34·5–52 g, female 32–41 g. A large, dark-headed greenbul with prominent white eyelids; crown feathers often erected into low shaggy crest. Nominate race has lores, cheeks and side of head dull olive-brown, contrasting white upper eyelid, narrower and less conspicuous pale lower eyelid; top of head and upperparts olive-brown, uppertail-coverts tinged rusty; wings olive-brown, flight-feathers edged yellowish-olive; tail olive-brown, sometimes tinged reddish; throat and underparts pale yellow, breast and flanks washed olive-grey; iris dark brown, red-brown or red; bill horn, blackish-horn or purplish-slate, paler cutting edges; legs grey or blackish. Sexes alike, female on average smaller than male. Juvenile is duller and paler than adult, eye grey or brownish; eyes become red after c. 6 months. Race *centralis* is duller and darker brown above than nominate, particularly on head, which contrasts with back; *occidentalis* is brighter overall, light olive-green above, greyer ear-coverts, top of head rather browner and darker, contrasting somewhat with back, rump paler, tail and flight-feathers edged green, brighter yellow below, breast washed brownish. Voice. Song of *centralis* a querulous, nasal "qui quaaa quer qua queree qwa", delivered slowly, notes evenly spaced and sometimes preceded with few low, quiet introductory notes; also "rrreek, rrreek, rrreek, yarr", alternating with continued chattering. Song of other races has similar buzzy quality but different rhythm, 4–6 notes on same pitch, also delivered slowly, "jit-jar-jeer-jeer-jar", "jit-jeer-jar-jui-jeeo", "jit-jeer-jui-jeeo" or "pao-pao-pao-pao", likened to yapping of small dog. Scolding a loud, repeated "pow", "paa" or "neh"; contact call a repeated "quar-tooa, quar-toar", changing to "kerr quar, kerr quar" or "thwank thwank" when summoning mate to food source. Two may call together asynchronously. During display a soft "chaacha".
Habitat. Evergreen and semi-deciduous forest of various types, including coastal forest, *Cryptosepalum* forest, gallery forest, dune forest, as well as riverine bush, coastal scrub, dense bush in wooded savanna; locally, in anthill thicket in miombo and mopane (*Colophospermum mopane*) woodland, drier thickets on hillsides, and even gardens. In forested areas favours thick undergrowth in edge habitats and dense second growth; rarely penetrates interior. Mainly found at low and medium elevations, but reaching 1700 m in Zambia and Malawi, and 2100 m in E Africa.
Food and Feeding. Fruit, including berries, and seeds and flowers; also insects. Nestling diet insects for first 3 days, then also berries and other fruit with hard seeds removed; fruits of *Allophylus*, *Carissa*, *Cissus*, *Clausena*, *Ficus*, *Lantana* and *Teclea* fed to young. Found in pairs or in groups of up to six individuals. Accompanies other bulbul species at fruiting trees; often joins mixed-species parties, and has been recorded as attending doryline ant swarms. Usually noisy, but often retiring and hard to see; will emerge early in morning to sun-bathe. Forages at all levels, but mainly in middle stratum and canopy in Zambia and Malawi; more often in lower strata in South Africa. Hawks insects in flight. Also perches on antelopes and grooms head, ears and eyes, presumably for ectoparasites; usually tolerated by antelope. Has also been recorded as pecking at preorbital glands of klipspringer (*Oreotragus oreotragus*), possibly seeking to ingest secretions.
Breeding. Nesting recorded in Mar–Aug in Kenya, Oct–Jan in W Tanzania, all months in DRCongo, Oct–Mar (mainly Nov–Jan) in Malawi, Sept–Feb in Zambia, Sept–Mar (mainly Oct–Dec) in Zimbabwe, Nov in Botswana, Oct–Jan in Mozambique, and Sept–Jan (mainly Oct–Dec) in South Africa; birds in breeding condition in Jan and Aug–Sept (and juvenile in Jun) in Angola and Mar in Mozambique. Monogamous. Solitary, territorial. In pre-copulatory behaviour following initial chase, female crouches and fans wings, male facing, both make soft calls, erect crown feathers, open bill, and rotate head asynchronously on elliptical course. Nest built by both sexes, in one instance completed in 7 days (in Kenya), a small, shallow, thin, loosely built cup of twigs, pieces of vine, tendrils, plants stems and grass, lined with tendrils, fine rootlets, grass blades and dead leaves, external diameter 8·5–10 cm and depth 4·5–5 cm, internal diameter 5·5–7·5 cm, cup depth 2·5–3·5 cm; placed 1–4 m above ground in fork in middle or canopy of small leafy shrub or near end of horizontal branch or among creepers, sometimes attached to support with cobwebs, usually (not always) well concealed by foliage. Clutch usually 2 eggs, sometimes 1 or 3; incubation by female only, fed at nest by male, period 14 days; chicks fed by both parents, male also broods, nestling period c. 16 days.
Movements. Little information. Thought to be sedentary.
Status and Conservation. Not globally threatened. Widespread and generally common. Population in S Mozambique thought to exceed 40,000 individuals; 4 pairs in 16 ha in C Kenya. Well represented in protected areas.

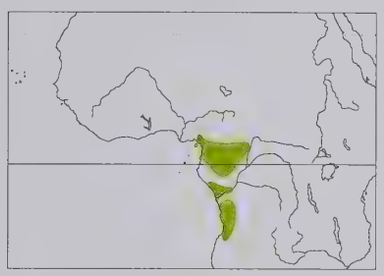
Bibliography. Ash & Miskell (1983, 1998), Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brown & Britton (1980), Buchan *et al.* (2000), Chalton (1976), Chapin (1953), Clancey (1964, 1996), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1989), Dowsett-Lemaire & Dowsett (2004), Frost (1979), Ginn *et al.* (1989), Hall & Moreau (1970), Hanmer (1978), Irwin (1981), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louw (2005b), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993), Mlingwa (1998), Mlingwa & Bairlein (1998), Oatley *et al.* (1997), Parker (1999), Penry (1994), Roberts (1993, 1995), Skinner (1995), van Someren (1956), Stevenson & Fanshawe (2002), Steyn (1975), Tarboton (2001), Turner & Zimmerman (1979), Vernon (1972b), Vincent, A.W. (1947), Vincent, J. (1935a), Willis (1983), Zimmerman *et al.* (1996).

64. Falkenstein's Greenbul

Chlorocichla falkensteini

French: Bulbul de Falkenstein **German**: Falkensteinbülbül **Spanish**: Bulbul de Falkenstein
Other common names: Yellow-necked/Yellow-throated Greenbul

Taxonomy. *Criniger Falkensteini* Reichenow, 1874, Chinchoxo, Loango Coast, Cabinda, Angola.
Has in the past been suggested as forming a superspecies with *C. flaviventris*, but subsequent studies have not supported such a relationship. Monotypic.
Distribution. Three apparently disjunct populations: SW Cameroon E to W Central African Republic and S to SC Gabon; S PRCongo, N Angola (Cabinda) and extreme SW DRCongo; and W Angola (Uige S to Huíla).



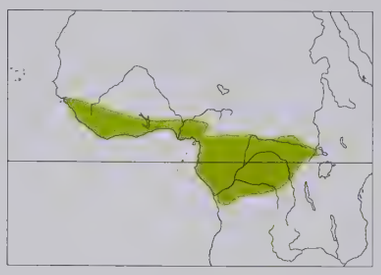
Descriptive notes. 18–20 cm; male 37–41 g, female 29–37 g. A medium-sized greenbul with conspicuous yellow throat. Has lores and fore cheeks darkish grey; rest of head, including rear cheeks and ear-coverts, side of neck and whole of upperparts, including wings and tail, bright olive-green; carpal area yellow; chin and throat bright lemon-yellow, this colour extending a little way onto side of neck; underparts pale grey, becoming creamy on belly, washed yellowish-olive on undertail-coverts and thighs; underwing-coverts and axillaries sulphur-yellow; iris dark red, crimson or orange-red; bill black or dark greenish-grey; legs blue or blue-grey. Distinguished from *C. flaviventris* by being grey (not yellow) below, and by lacking eyering; from *C. flavicollis* by smaller size, green (not brown) upperparts, red (not pale) eyes. Sexes alike, female on average smaller than male. Juvenile resembles adult, but gape yellow, eyes light brown. Voice. Song a string of 6–10 nasal notes, "kik-kuk-ku-kwéé-uk-wik-e-wik-kup", or "kip-kop-ko-kwéé-ko-witawit-kup", with some variations; reminiscent of songs of *C. flaviventris* and *C. simplex* in quality. Chattering calls similar.
Habitat. Isolated forest patches, dense secondary growth, riparian woodland and thicket; avoids forest proper. Favours secondary and anthropogenic habitats, such as clearings and other edge situations, abandoned farmland, fallows, banana plantations, regenerating coffee plantations, deserted villages and gardens.
Food and Feeding. Berries and other fruit, including *Ficus*, *Rauwolfia*, *Solanum*, *Trema* and small peppers; also insects, such as alate termites (Isoptera) and caterpillars. Occurs in pairs or small family parties; occasionally joins mixed-species flocks. Forages in vegetation of small and medium-sized trees and bushes. Often stays hidden, when presence revealed by frequent vocalizations; at other times, will frequently jump out on to exposed perches and call while raising each wing alternately (yellow underwing-coverts) and flicking tail. Territorial all year; in Gabon, present species, *C. flavicollis* and *C. simplex* seem to exclude one another locally.
Breeding. Nesting recorded in May and Jul in Cameroon; Nov in Gabon, where flying young seen Jun, nest-building Jan and Mar, and most vocal Sept–Feb; birds in breeding condition in Oct and juveniles with traces of down in Jan in Angola. Territorial. Only one nest described, built by presumed female, accompanying mate singing, a shallow cup of bark fragments and leaf stems, lined with fine grasses, internal diameter 5·5 × 6·5 cm, in fork of bush. Clutch 2 eggs; incubation by female only; no information on inclubation and nestling periods; fledglings fed with caterpillars by both parents.
Movements. Sedentary, at least in Gabon.
Status and Conservation. Not globally threatened. Locally common to rare. Density in Gabon up to 12–15 birds/ha in places, but often much lower. Occurs in a number of protected areas, including Campo Ma'an National Park, in Cameroon, Dzanga-Ndoki National Park, in Central African Republic, Lopé National Park, in Gabon, Odzala National Park, in PRCongo, Bombo-Lumene Game Reserve, in DRCongo, and Quiçama National Park, in Angola.
Bibliography. Borrow & Demey (2001), Brosset (1971a), Brosset & Érard (1986), Chapin (1953), Chappuis (1975), Christy & Clarke (1994), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Fishpool & Evans (2001), Germain & Cornet (1994), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1963, 1973), Sargeant (1993), Schouteden (1957).

65. Simple Greenbul

Chlorocichla simplex

French: Bulbul modeste **German**: Hartlaubbülbül **Spanish**: Bulbul Sencillo

Taxonomy. *Trichophorus simplex* Hartlaub, 1855, River Boütry, Ghana.
Monotypic.
Distribution. SE Guinea-Bissau E to extreme S Sudan and W Uganda, S to N Angola and C & NE DRCongo.
Descriptive notes. c. 21 cm; male 41–54·5 g, female 40–49 g. A large greenbul with conspicuous white throat and white eyering. Has blackish lores, some indistinct paler streaking on cheeks and ear-coverts, contrasting white broken eyering broader above eye than below it; rest of head and whole of upperparts, including wings and tail, dark brown, tail and flight-feathers edged olive; throat and malar region white, breast and flanks light olive-brown, lower flanks washed buffy, centre of belly creamy white or yellowish-buff, undertail-coverts buff; iris dark brown or reddish-brown; bill black, paler cutting edges; legs dark grey or bluish-slate. Distinguished from *C. flavicollis* (of race *soror*) by contrasting eyering, dark eyes, overall darker coloration above, also by voice. Sexes alike, female on average smaller than male, with redder iris. Juvenile undescribed. Voice. Song a subdued nasal chattering of 8–12 notes, starting quietly and increasing in volume, third note from last typically highest and loudest, "wido, wida-wit-do, wida-kwít-to-kwair". Chattering, burry "kurra-kurra-kurra" thought to be contact call; also has scolding, nasal "churrk-churrk" or "wherr", and short, clipped "kwit!".



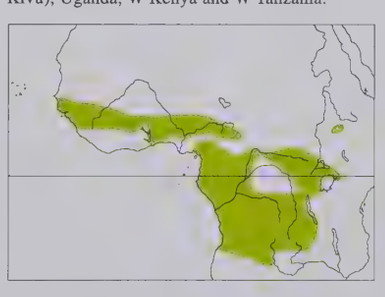
Habitat. Thick bush of various sorts, including orchard-bush, dense shrubs in savanna, thickets, gallery forest, farmbush and forest edge in the forest zone and forest–savanna mosaic; avoids forest proper. Readily adapts to secondary growth around farmland, fallows, cassava fields, large clearings, village margins and other degraded habitats, but not along edges of logging roads in forest. Mainly lowlands, but recorded to 1500 m in Liberia.
Food and Feeding. Fruit, including particularly *Solanum*, also *Rauwolfia*, *Trema*, palms and red peppers; also seeds; also arthropods, such as alate termites (Isoptera), caterpillars, spiders (Araneae). Typically in pairs or small family groups; occasionally joins mixed-species flocks. Generally rather shy and skulking, staying within thick vegetation, and revealing its presence by its voice; will perch in the open at times. Territorial throughout year; defends area of 1–2 ha in Gabon, where present species, *C. flavicollis* and *C. falkensteini* seem to exclude one another locally.
Breeding. Nesting recorded in Mar in Sierra Leone, Feb and Apr (also nest-building Jul, Dec) in Ghana, Jan and Jun–Sept in Nigeria, Jan, Mar, Jun–Sept and Dec in Cameroon, Sept–Feb (peak Jan, once Jul in unusual year) in Gabon, and Aug and Oct–Mar in DRCongo; birds in breeding condition Feb and Jun–Nov (fledglings Oct–Nov, independent young Dec–Feb) in Liberia and Sept–Dec and Feb in Central African Republic. Territorial. Nest a small, shallow cup, thin and compact but strong, made of twigs, rootlets, plant stems, dry grasses, vines and other fibrous matter, bound together with cobwebs and unlined, external diameter 8–11 cm, depth 8–11 cm, internal diameter 5–7 cm and cup depth 4 cm, placed 0·9–2 m above ground in fork of dense clump of bushes or saplings (native or introduced); of twelve nests in Gabon, eight built in *Solanum* and one each in *Trema*, *Harungana*, in middle of cassava crop and in ornamental hedge; elsewhere, nests recorded in *Triumfetta*. Clutch 2 eggs, sometimes 1; incubation by female only; no information on incubation and fledging periods. In Gabon, three eggs of 24 laid were infertile, and seven of eleven nests were robbed.
Movements. Sedentary, at least in Gabon.
Status and Conservation. Not globally threatened. Widespread, and locally common to abundant. This species' propensity for occupying anthropogenic habitats means that it is unlikely to become of conservation concern. Occurs in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Cross River, in Nigeria, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, Virunga, in DRCongo, and Semliki, in Uganda.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Gatter (1997), Germain & Cornet (1994), Grimes (1987), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Nikolaus (1989), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Rodwell (1996), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985).

66. Yellow-throated Greenbul

Chlorocichla flavicollis

French: Bulbul à gorge claire **German**: Gelbkehlbülbül **Spanish**: Bulbul Gorgiamarillo
Other common names: Yellow-throated Leaflove

Taxonomy. *Haematornis flavicollis* Swainson, 1837, West Africa.
Despite generic placement, appears on basis of voice and behaviour to be closest to *Thescelocichla leucopleura* and *Pyrrhurus scandens*. Has been suggested that nominate race and *soror* may represent two different species, as the two occur to within 50 km of each other in Cameroon, but with no intergrades known; in addition, some vocal differences exist, and nominate in Mali recently shown not to respond to playback of song of *soror*; further study needed. Racial identity of population in NW Central African Republic uncertain, tentatively placed in nominate. Proposed race *simplicicolor* (E Cameroon) considered not safely distinguishable from *soror*; *pallidigula* (described from Entebbe, in Uganda) on average rather darker overall than *flavigula*, but not satisfactorily separable from it. Three subspecies recognized.
Subspecies and Distribution.
C. f. flavicollis (Swainson, 1837) – Senegambia and SW Mali E to Nigeria, N Cameroon (Adamaoua Plateau) and NW Central Africa Republic, S to Sierra Leone, N Ivory Coast, SE Ghana and S Benin.
C. f. soror (Neumann, 1914) – NC Cameroon (Tibati) E to S Central African Republic and SW Sudan, S to PRCongo and C DRCongo (S to N Kasai and N Maniema); also WC Ethiopia.
C. f. flavigula (Cabanis, 1880) – Angola, SE & E DRCongo (S from S Kasai, S Maniema and Kivu), Uganda, W Kenya and W Tanzania.



Descriptive notes. c. 22·5 cm; male 46–60 g, female 37–47 g (*flavigula*). A large, noisy non-forest bulbul with conspicuous, contrastingly coloured throat and pale eyes. Male nominate race has lores, cheeks and ear-coverts olive-brown; top of head dark greyish olive-brown with dark feather centres (appearing scaly, most obviously so on forehead and forecrown); upperparts, including wings and tail, dark olive-brown, flight-feathers and tail feathers edged greenish-olive; throat bright sulphur-yellow; underparts greyish olive-brown, paler than upperparts, some scattered yellowish streaking, breast feathers with grey tips, lower belly and undertail-coverts brown; iris dull yellow, creamy-buff, grey-buff or pale brown; bill black; legs grey or dark grey. Female is on average smaller than male. Juvenile is darker overall than adult, but throat whitish. Race *soror* distinctive, has throat white with only a trace of yellow, underparts somewhat greyer, also upperparts on average greyer in N parts of range, browner in S; *flavigula* has paler yellow throat than nominate (brighter in E of range), underparts brownish or

greenish-olive in E, greyer in W, but with whitish shaft streaking throughout, belly centre paler than nominate, pale brown, creamy or pale yellowish, undertail-coverts pale brown. Voice. Song a string of harsh, nasal, grating "chow" or "kio" notes interspersed with shorter notes, similar in quality to that of *Pyrrhurus scandens* and *Thescelocichla leucopleura*; some racial variation, e.g. "kion-kio-kio-kio-kio" (nominate), "chow, chow, ch-ch-chow", "chow, chi-chu-chu, chow, chow" (*soror*) or "skyow-skyow-chyow-chyow, ch-ch-ch-ch-ch-ch" (*flavigula*). Contact calls include loud, rasping, nasal "chow", and "tchwaa, tchwaa" and shorter "kyip", given by group-members while foraging.

Habitat. Wooded and bushy habitats away from forest, including open woodland, gallery forest, orchard-bush, thickets, riparian bushes and scrub. In forested areas may occur in clearings and some drier types of second growth, but does not penetrate interior. Readily adapts to anthropogenic habitats such as abandoned cultivation, *Lantana* thicket, plantations, orchards, parks, wooded gardens and mango trees. Also found at edges of *Papyrus* swamps, sometimes entering them. Lowlands and medium elevations, but to 1800 m in Cameroon, 2000 m in DRCongo; to 2300 m, but mainly below 1500 m, in E Africa.

Food and Feeding. Fruit, including *Rauwolfia*, *Solanum*, *Trema*, guava, mango, red pepper; also some insects, including beetles (Coleoptera) and caterpillars. Almost always found in small family parties, less often in pairs or alone. Members of group often move in close succession, one landing on perch just vacated by another. Forages mostly at low levels, including on ground, but rises to middle and upper middle levels in taller trees. Rather shy, but will emerge on to vantage points periodically to look around. Highly vocal while foraging; scolds frequently, often accompanied by puffing-out of crown and throat feathers and wing-flicking. In Gabon, present species, *C. simplex* and *C. falkensteini* seem to exclude one another locally.

Breeding. Nesting recorded in Jul and Nov–Dec in Gambia, Nov in Mali, May–Aug in Nigeria, Dec in PRCongo, Dec–Jul (breeding condition Sept–Oct) in DRCongo, Oct–Dec in Rwanda, Sept in Sudan, Dec–Jun and Aug–Sept (peaks in long rains and dry season) in Uganda and W Kenya, and Sept–Feb (peak Oct–Nov) in Zambia; birds in breeding condition in Aug–Sept and Jan and juvenile in Jun in Angola. Thought to be co-operative breeder; in Gabon, groups of three individuals, believed not necessarily to comprise a pair and young, jointly defend territory. Nest built by only one of pair, presumed female, while mate watched, construction took 10 days (first egg laid 2 days later), presumed male subsequently drove off all birds approaching site; nest a cup of small twigs, rootlets, leaf stems and dry leaves, bound together with cobwebs, in one case lined with *Casuarina* leaves, placed 2–10 m above ground in tree fork formed by small branches or junction of palm leaves, or suspended between fork twigs of horizontal branch, usually in tree with dense foliage (e.g. mango); frequently in suburban location such as garden or compound, often close to buildings. Clutch 2 eggs; no information on incubation and nestling periods. Known host of Red-chested Cuckoo (*Cuculus solitarius*).

Movements. Sedentary, at least in Gabon.

Status and Conservation. Not globally threatened. Status varies; considered scarce, not uncommon, common or locally abundant in different parts of its extensive range. Given this species' habitat preferences, and the fact that it does not require undisturbed forest, its future seems assured. Well represented in protected areas.

Bibliography. Ash (1973a, 1977), Bannerman (1936, 1953), Barlow *et al.* (1997), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool *et al.* (1994b), Gore (1990), Grimes (1987), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Morel & Morel (1990), Nikolaus (1987, 1989), Prigogine (1971, 1978, 1984), Rand (1958), Rodwell (1996), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985), Turner & Zimmerman (1979), Urban & Brown (1971), Zimmerman *et al.* (1996).

Genus *THESCELOCICHLA* Oberholser, 1905

67. **Swamp Palm Bulbul**

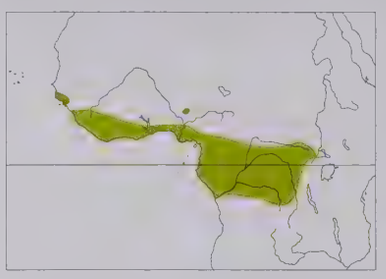
Thescelocichla leucopleura

French: Bulbul des raphias **German**: Raphiabülbül **Spanish**: Bulbul de las Rafias
Other common names: White-tailed/Swamp Greenbul

Taxonomy. *Phyllostrophus* [*sic*] *leucopleurus* Cassin, 1855, Moonda River, Gabon.

A distinctive species; on basis of bill shape, voice and behaviour, appears closest to *Pyrrhurus scandens* and *Chlorocichla flavicollis*. Monotypic.

Distribution. S Senegal, Guinea-Bissau and E Guinea E, including isolated population in C Nigeria (Jos Plateau), to extreme W Uganda, S to PRCongo, N Angola (Cabinda) and E DRCongo.



Descriptive notes. c. 23 cm; male 61–67 g, female 58–60 g. A large, conspicuous and distinctive bulbul. Lores, cheeks and ear-coverts are olive-brown with conspicuous white centres and shaft streaking, giving speckled and streaked effect to side of head, eyering whitish; top of head and entire upperparts, including wings, olive-brown, crown feathers fringed dark (scaly appearance); tail olive-brown, outer four pairs of feathers broadly tipped white, white increasing from c. 15 mm on T3 to 30 mm on T6; throat off-white, upper breast pale grey-buff with white shaft streaking, rest of underparts creamy white; iris brown, red-brown or reddish; bill black, lower mandible paler, tinged greyish or bluish; legs dark grey-brown, grey or bluish-grey. Sexes alike, female on average smaller than male. Juvenile is browner above, throat and breast pale yellow. Voice. Most common vocalization a raucous nasal cackling made by foraging flock, begins quietly, in fairly low register, but rapidly increases in volume and becomes higher and more shrill, "kokoko...eeko-rít-toto-tréé-tu-trít-toro", likened to a tape-recorded conversation played too fast; as one bird starts, it immediately provokes other flock-members to join in; these outbursts end abruptly, but are repeated after silence of c. 10–20 seconds. Song similar, given by single individual, often in two parts, increasing in volume, "ti-tu-to-trít-to...ti-to-réé-to-ráá". Call a penetrating, nasal chattering on even pitch, "cha-cha-cha-cha".

Habitat. Swampy forest areas with palm trees, particularly *Raphia*, to lesser extent, *Elaeis*, in lowland forest zone; also areas outside forest but with palms, less often in drier forest, such as around clearings; sometimes in *Pandanus*. Penetrates forest–savanna mosaic and gallery forest in some places; also cacao plantations, as well as cultivation with mature fruit trees, where close to forest. Sea-level to 800 m in Liberia, to 1050 m in Cameroon and 1100 m in DRCongo.

Food and Feeding. Fruit, including *Ficus*, *Heisteria*, *Macaranga*, *Morinda*, *Musanga*, *Schleffera*, *Trichilia*, peeled palm nuts, bananas, and seeds; also insects such as caterpillars, alate termites (Isoptera), ants (Hymenoptera). Occurs in voluble monospecific groups of 3–10 individuals, sometimes more. Rarely joins multi-species flocks; occasionally follows *Dorylus* ant swarms. Forages at all levels, from ground (occasionally) to tops of palms, and up to 20 m in high forest. Moves rapidly, using vertical to horizontal perches, gleaning items from foliage, tangles of dead leaves, epiphytic plants, lianes, etc., working over bark, often clinging to trunks, or taking prey items off them while hovering.

Breeding. Nesting recorded in Feb in Ghana, Feb, May and Jul (and in breeding condition in Sept–Oct) in Cameroon, and Jan, Mar–Apr and Aug–Sept in Gabon; birds in breeding condition in Jun–Jul in Liberia and Nov in DRCongo. Thought to be a co-operative breeder; in Gabon, 3–4 birds gave alarm calls simultaneously at presence of intruder, and two young leaving nest observed to be fed by four different adults. Territory defended by loud chorusing by all group-members, and displays involving spreading of wings and tail. Only one nest described, made of long strips of half-rotten leaves, built 2 m above ground in banana tree in abandoned plantation; known also to nest in swamp palms; territory a few hectares in palm swamps, 12–15 ha in suboptimal habitat (e.g. edges of cultivation in Gabon). Clutch 2 eggs; incubation by female only, young fed by both parents, no information on duration of incubation and nestling periods.

Movements. Largely sedentary; some nomadism recorded.

Status and Conservation. Not globally threatened. Widespread and, in suitable habitat, common. Recorded in numerous protected areas including Marahoué National Park, in Ivory Coast, Kakum National Park, in Ghana, Okomu National Park, in Nigeria, Mbam-Djerem National Park, in Cameroon, Lopé National Park, in Gabon, Odzala National Park, in PRCongo, Salonga National Park, in DRCongo, and Semliki National Park, in Uganda.

Bibliography. Bannerman (1936, 1953), Barlow *et al.* (1997), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire (1996), Dowsett-Lemaire & Dowsett (1991, 1998b), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Morel & Morel (1990), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Smith *et al.* (1996), Stevenson & Fanshawe (2002), Thiollay (1985), Willis (1983).

PLATE 20 ➤


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ssp debilis

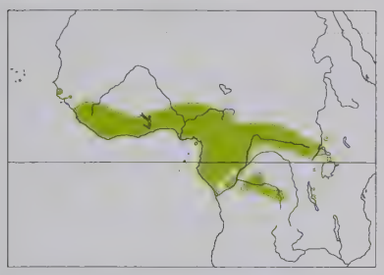
Genus *PYRRHURUS* Cassin, 1859

68. **Leaf-love**

Pyrrhurus scandens

French: Bulbul à queue rousse **German**: Uferbülbül **Spanish**: Bulbul Colirrojizo
Other common names: African/Common Leaflove

Taxonomy. *Phyllastrephus scandens* Swainson, 1837, West Africa.
Often included in *Phyllastrephus*, and has even been suggested as forming a superspecies with two members of that genus (*P. fischeri* and *P. cabanisi*), but relationship seems remote and, further, it differs in plumage and colour pattern. On basis of bill shape, voice and behaviour, appears more closely allied to *Thescelocichla leucopleura* and *Chlorocichla flavicollis*. Until more is known of its affinities, it seems preferable to retain present species in its own, monotypic genus. Proposed races *acedis* (described from R Ogobai, in Gabon) and *upembae* (S DRCongo) considered not satisfactorily distinguishable from *orientalis* (former on average darker above with more rufous tail, latter with paler browner tail). Two subspecies recognized.
Subspecies and Distribution.
P. s. scandens (Swainson, 1837) – Gambia and SW Senegal, E Guinea-Bissau and W Guinea E to N Cameroon.
P. s. orientalis (Hartlaub, 1883) – N Cameroon E to extreme S Sudan, and S to S PRCongo and W & S DRCongo (scattered localities in Kwango, Kasai and Katanga); also C Uganda, extreme NE Rwanda and extreme W Tanzania.



Descriptive notes. c. 22 cm; male 61–67 g (nominate), male 43–53 g, female 33–51 g (*orientalis*). Large, handsome distinctively coloured bulbul, feathers of lower back and rump long and loose. Nominate race has pale grey-olive lores, non-contrasting and rather inconspicuous creamy-white eyering, light brownish-grey ear-coverts with indistinct paler shaft streaking; top of head and neck olive-grey, mantle, back, scapulars and lesser wing-coverts brownish olive-green, rump paler and more chestnut, uppertail-coverts brighter chestnut; wings brown, edged rufous on flight-feathers; tail pale rufous-chestnut ; throat white, breast and flanks dirty buff, lower flanks washed cinnamon, lower breast and belly creamy buff; iris reddish-brown, greyish-brown or bluish-grey; upper mandible dark horn, olive-green or bluish-grey, lower mandible whitish or pale grey, cutting edges and tip whitish to yellowish; legs blue-grey, pale pinkish-grey or pale olive-green. Sexes alike, female on average smaller than male. Juvenile resembles adult, but upperparts washed russet, throat washed grey, underparts white. Race *orientalis* is smaller than nominate, greyer above, slightly paler below. Voice. Song begins with a few subdued nasal notes, "kawp, kawpa", then bursts into loud, rapid, exuberant, pleasing, conversational cackling, "kyop-kee-kyop-kyop-ke-kyop", is uttered repeatedly by family groups in chorus. Variations include sharp, high-pitched "chip-chip-chip-chip-chip" repeated by one or more individuals, others joining occasionally with hoarse "karp" or "koko".
Habitat. Marked preference for waterside habitats; forest fringing rivers, gallery forest and thicket, also forest patches in savanna and orchard-bush. In forest zone proper, normally found only in areas of *Raphia* swamp; absent from wetter forest types in some areas (e.g. Upper Guinea and parts of DRCongo). From sea-level to 1200 m; to 1500 m on Mt Nimba, in Liberia.
Food and Feeding. Arthropods, including grasshoppers (Orthoptera), beetles (Coleoptera), caterpillars, termites (Isoptera); also small gastropods, berries and seeds. Occurs in pairs or, more usually, small groups; regularly joins mixed-species parties. Forages energetically and acrobatically at all levels, but mainly in middle and upper strata. Gleans from foliage, clumps of dead leaves, crevices, tree trunks, lianes, etc., and makes short aerial sorties to catch flushed prey and alate termites; also explores leaf litter and exposed roots on ground. Flicks and shivers tail.
Breeding. Nesting recorded in Oct in Sudan, Jan in Liberia, Dec–Feb in Ghana, Dec–Jan in Cameroon and Oct–Nov in DRCongo; carrying nesting material in Mar in Togo; birds in breeding condition in Oct–Nov in Nigeria, Jun in Central African Republic and Apr and Jul in Uganda. Territorial. Nest cup-shaped, made of dry leaves, grass and strips of palm frond, unlined, one had internal dimensions of 6 × 7 cm; suspended from small branches of bush or tree overhanging stream, attached by cobwebs and black hair-like fibres which form net around exterior of nest. Clutch 2–3 eggs; incubation by female only; no information available on incubation and nestling periods.
Movements. Resident, so far as known.
Status and Conservation. Not globally threatened. Locally common; has large range, but distribution fragmented. At least some gaps in its distribution are real, as it is not an easy species to overlook. Density estimated at 1 group/3 ha of gallery forest in Semliki (Uganda). Occurs in numerous national parks, including those of Haute Niger, in Guinea, Marahoué, in Ivory Coast, Kakum, in Ghana, Okomu, in Nigeria, Mbam-Djerem, in Cameroon, Lopé, in Gabon, Odzala, in PRCongo, Salonga, in DRCongo, and Semliki, in Uganda.
Bibliography. Bannerman (1936, 1953), Barlow *et al.* (1997), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Claffey (1995), Colston & Curry-Lindahl (1986), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Gatter (1997), Gore (1990), Grimes (1987), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Morel & Morel (1990), Nikolaus (1987, 1989), Rossouw (2001), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985).

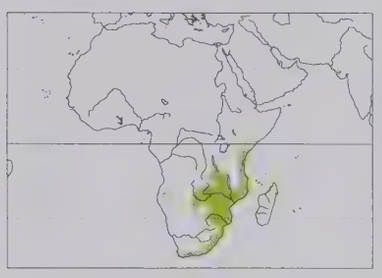
Genus *PHYLLASTREPHUS* Swainson, 1831

69. **Terrestrial Brownbul**

Phyllastrephus terrestris

French: Bulbul jaboteur **German**: Laubbülbül **Spanish**: Bulbul Terrestre
Other common names: Terrestrial Bulbul, Bristle-necked Brownbul

Taxonomy. *Phyllastrephus terrestris* Swainson, 1837, Outeniekwa Forest, Western Cape, South Africa.
Race *suahelicus* intergrades clinally with *intermedius* in Malawi and N Mozambique. Poorly marked race *bensoni* (described from lower Meru Forest, in Kenya) is treated as a synonym of *suahelicus*; similarly, *katangae* (extreme SE DRCongo) synonymized with *intermedius*. Three subspecies currently recognized.
Subspecies and Distribution.
P. t. suahelicus Reichenow, 1904 – S Somalia and C & E Kenya (Meru and Chuka forests, Mt Kenya, coast) S to N Mozambique.
P. t. intermedius Gunning & Roberts, 1911 – SE DRCongo, Zambia, Malawi and N Mozambique S to N Botswana, Zimbabwe and NE South Africa (S to E KwaZulu-Natal); isolated population in SW Angola.
P. t. terrestris Swainson, 1837 – Swaziland and E & S South Africa (W KwaZulu-Natal S along coastal fringe to Western Cape).



Descriptive notes. 20–22 cm, 33–47 g (nominate); 17–19 cm, male 29·5–44 g, female 24·5–38 g (*intermedius*); 17–19 cm, male 31–40 g, female 25–34 g (*suahelicus*). A large brown and white bulbul. Nominate race has ill-defined blackish line from lores to behind eye, olive-brown cheeks and ear-coverts with some paler streaking, narrow, relatively inconspicuous whitish broken eyering; top of head and upperparts, including wings, dark olive-brown, lower back to uppertail-coverts and tail warm gingery brown; throat white, upper breast and flanks olive-brown, lower breast and belly creamy, lower flanks and undertail-coverts buffy olive; iris red, red-brown or golden-brown; bill blackish-horn, paler lower mandible and cutting edges; legs slate-grey to silvery grey or brownish-horn. Differs from *P. strepitans* in duller, more olive-tinged upperparts, lacking reddish tones, and paler legs. Sexes alike, female on average smaller than male. Juvenile is somewhat paler and brighter. Race *intermedius* is smaller than nominate, has paler, brownish-olive upperparts, rusty-tinged brown rump, uppertail-coverts and tail, paler below, side of breast and flanks less contrasting, lower breast and belly white; *suahelicus* is same size as previous, but differs in having flanks browner, less grey, white underparts with faint buffy wash, upperparts with slight reddish wash, rump and tail slightly darker red, legs pale greyish-lavender, greyish-pink or light purplish-grey. Voice. Song a rough chattering of 4–10 low, burry, husky notes, all on one pitch (lower than that of *P. strepitans*), e.g. "chrrrrk, chrrk-chrrk, chrrrrk", "tchr tchr tcheerr tcheerr tchr tchr", or similar; intervals between phrases 4–10 seconds, sometimes punctuated by quiet, conversational "chut" or "chudut". When foraging, a continuous chattering of harsh churring notes, e.g. "prrrp-prrrp-prrrp-prrrrp", "warrarak-warra" or "wark-wark wárk"; foraging pair may from time to time break into rough duet, the churring notes speeding up and rising in pitch to become a short, harsh trill interspersed with some pure, shrill notes.
Habitat. Variety of thickly vegetated habitats, including evergreen forest (mostly lowland and coastal, occasionally montane), riparian forest, riverine bush, thickets, thick scrub, dense woodland and abandoned cultivation. From sea-level to 1500 m in South Africa (KwaZulu Natal); to 1750 m, exceptionally 2050 m, in Malawi, and 1400 m in Kenya.
Food and Feeding. Arthropods, particularly ants (Hymentoptera), grasshoppers (Orthoptera), beetles (Coleoptera), termites (Isoptera); also gastropods, small lizards; some fruit and seeds. Usually found in small groups; attends *Dorylus* ant swarms, and joins mixed-species flocks. Skulking and often hard to see, generally staying within cover; members of group cross open spaces reluctantly, one by one. Generally at or near ground level, where scratches about in leaf litter with the bill and feet and probes into vegetable debris. Also forages in bunches of dead leaves in creeper tangles to height of 7–12 m. Frequently flicks both wings together, combined with rapid tail-pumping. Has been recorded as gleaning ticks off red duiker (*Cephalophus natalensis*).
Breeding. Nesting recorded in Jan and Aug in Kenya, Oct–Apr (mainly Nov–Jan) in Zambia, Sept and Dec–Apr (mainly Dec–Feb) in Malawi, Oct–Apr in Mozambique, Sept–Feb and Apr (mainly Nov–Dec) in Zimbabwe, Oct and Dec in Botswana and Oct–Jan in South Africa; birds in breeding condition in Nov–Dec in Angola; possibly double-brooded. Monogamous. Solitary nester; territorial. Nest, reportedly built by both sexes, a shallow, flimsy and untidy cup of dark twigs, skeletonized leaves, dark stringy tendrils, roots, bark, moss and lichen, lined with rootlets, fine fibres and a few leaves, external diameter 8·5–9 cm, depth 3·5–6 cm, internal diameter 5–6·5 cm, depth 2–3 cm; usually 1–2 m above ground on branch or slung in fork, usually in dark tangle near edge of bush or thicket; nests in successive years built within c. 1–2 m of previous year's site. Clutch 1–4 eggs, usually 2; incubation by both sexes, period 13 days; chicks fed by both parents, at one nest only one adult seen to brood very young chicks (for periods of up to half an hour between foraging trips); no information on duration of nestling period.
Movements. Thought to be largely sedentary; of 62 individuals ringed in Zimbabwe, 38 recaptured at same place c. 7–8 times. Suspected that birds at highest altitudes in Malawi (2050 m) and Zimbabwe are wanderers.
Status and Conservation. Not globally threatened. Generally common, but local in parts of its range. Estimated densities in Swaziland 3 birds/100 ha in acacia (*Acacia*) savanna, 19 birds/100 ha in broadleaf woodland and 330 birds/100 ha in riverine forest; in Knysna Forest, in South Africa,

On following pages: 70. Northern Brownbul (*Phyllastrephus strepitans*); 71. Pale Olive Greenbul (*Phyllastrephus fulviventris*); 72. Grey-olive Greenbul (*Phyllastrephus cerviniventris*); 73. Baumann's Greenbul (*Phyllastrephus baumanni*); 74. Toro Olive Greenbul (*Phyllastrephus hypochloris*); 75. Fischer's Greenbul (*Phyllastrephus fischeri*); 76. Cabanis's Greenbul (*Phyllastrephus cabanisi*); 77. Cameroon Olive Greenbul (*Phyllastrephus poensis*); 78. Icterine Greenbul (*Phyllastrephus icterinus*); 79. Liberian Greenbul (*Phyllastrephus leucolepis*); 80. Sassi's Olive Greenbul (*Phyllastrephus lorenzi*); 81. Xavier's Greenbul (*Phyllastrephus xavieri*); 82. White-throated Greenbul (*Phyllastrephus albigularis*); 83. Yellow-streaked Greenbul (*Phyllastrephus flavostriatus*); 84. Grey-headed Greenbul (*Phyllastrephus poliocephalus*); 85. Tiny Greenbul (*Phyllastrephus debilis*).

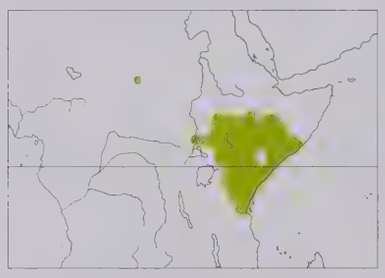
average 4·3 birds/24·5ha over a five-year period; 17 birds/100 ha in acacia woodland in S Mozambique, where population for the region thought to exceed 100,000 individuals. Well represented in protected areas.
Bibliography. Ash & Miskell (1983, 1998), Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brown & Britton (1980), Chapin (1953), Clancey (1964, 1996), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1989), Dowsett-Lemaire & Dowsett (2004), Ginn *et al.* (1989), Hall & Moreau (1970), Hanmer (1978, 1984), Hanmer & Manson (1988), Harrison *et al.* (1997), Harwin & Manson (1989), Irwin (1979, 1981), Jackson & Sclater (1938), Keith *et al.* (1992), Koen (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Lloyd (2005e), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993), Monadjem (2001b, 2002b, 2003), Parker (1999), Penry (1994), Sinclair & Hockey (1996), Skinner (1995), van Someren (1956), Stevenson & Fanshawe (2002), Tarboton (2001), Turner & Zimmerman (1979), Tyler & Lewis (1997), White & Mckenzie (2001), Zimmerman *et al.* (1996).

70. **Northern Brownbul**

Phyllastrephus strepitans

French: Bulbul brun **German**: Schillingsbülbül **Spanish**: Bulbul Pardo

Taxonomy. *Criniger strepitans* Reichenow, 1879, Malindi, Kenya.
Monotypic.
Distribution. SE Sudan, S Ethiopia, S Somalia, N & NE Uganda, Kenya and NE Tanzania; isolated population in W Sudan (Jebel Marra).



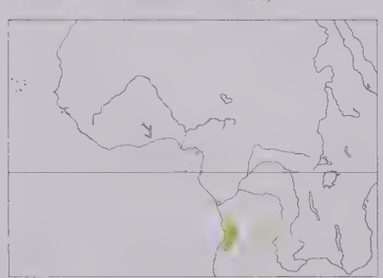
Descriptive notes. 15–18 cm; male 19–29 g, female 17–24 g. A medium-sized, predominantly brown pycnonotid, undistinguished in appearance, tail rather more graduated than that of most congeners. Lores and cheeks are pale grey-brown, ear-coverts pale brown with ill-defined narrow paler streaking; obscure darker line immediately in front of and behind eye, contrasting narrow white broken eyering; top of head and upperparts warm reddish-brown, rump and uppertail-coverts bright rufous, tail reddish brown; wings rufous-brown; throat white or pale buff, breast and flanks grey-brown, variably washed buff, lower breast and belly white, lower flanks, undertail-coverts and thighs buff; iris brown, red-brown or pale stone; bill black, paler lower mandible, cutting edges and tip; legs bluish-black or bluish-grey. Differs from *P. terrestris* in smaller size, brighter and more reddish-brown upperparts lacking olive tones, duller throat, darker legs; from *P. cerviniventris* also in warmer reddish upperparts, paler underparts, dark bill, legs and eye; from *P. cabanisi* in concolorous tail and back, dark eyes; from *P. fischeri* in dark eyes. Sexes alike, female on average smaller than male. Juvenile has top of head and back duller, eye dull brown. Voice. Song a harsh, rapid chatter, penetrating and insistent, "skrrrk-skrrrk-kk-kk-kk-kk-kk…" or "chichichichichichi-chk, chik-chik-chik…", often by pair in duet or by several together, often preceded and concluded by some slower, softer notes; reminiscent of *Turdoides* babbler, higher-pitched and faster than that of *P. terrestris*, often extended, interrupted with brief pauses every 10 seconds or so. Quieter contact calls when foraging.
Habitat. Forest edge, open woodland, wooded grassland, evergreen and deciduous thicket, riverine bush and scrub; from sea-level to 1600 m, mainly below 1000 m.
Food and Feeding. Insects and fruit, including *Lantana* and *Rhus*. Occurs in pairs or small groups; members of group cross open spaces one after the other. Has been recorded in mixed flocks with *P. cerviniventris*. Shy, forages low down in undergrowth; mean height of 1·2 m recorded in study in Kenya. Gleans from leaves, plant stems, the ground; also makes aerial sallies. Flicks wings tail constantly, both when foraging and when perched.
Breeding. Nesting recorded in Jan–Feb in Sudan, May in Ethiopia, Jan and Jun in Kenya; birds in breeding condition in May in Uganda and in Aug and Oct–Mar in coastal Tanzania. One nest reported as in "an acacia". No other information.
Movements. No information.
Status and Conservation. Not globally threatened. Common to locally abundant. Across much of its range inhabits dry scrub, a habitat under little threat. Well represented in protected areas, including Kidepo Valley National Park, in Uganda, and Meru and Tsavo National Parks, in Kenya.
Bibliography. Ash & Miskell (1983, 1998), Britton (1972, 1980), Cave & MacDonald (1955), Cordeiro *et al.* (1995), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Mlingwa (1993), Nikolaus (1987, 1989), Stevenson & Fanshawe (2002), Turner & Zimmerman (1979), Urban & Brown (1971), Wilson & Wilson (1994), Wood (1989), Zimmerman *et al.* (1996).

71. **Pale Olive Greenbul**

Phyllastrephus fulviventris

French: Bulbul à ventre roux **German**: Angolabülbül **Spanish**: Bulbul Ventrirrufo

Taxonomy. *Phyllostrephus* [*sic*] *fulviventris* Cabanis, 1876, Chinchoxo, Loango Coast, Cabinda, Angola.
Forms a superspecies with *P. cerviniventris*. Monotypic.
Distribution. Extreme W DRCongo and NW & W Angola (Cabinda, and from Uíge and Cuanza Norte S to W Huíla and N Namibe).



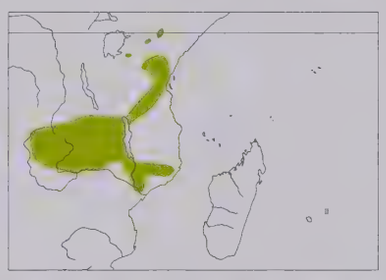
Descriptive notes. c. 19 cm; male 32–38 g, female 27–30 g. Undistinguished-looking greenbul. Head is olive-grey, palest on forehead, lores pale, conspicuous white broken eyering merging with area of pale feathering above and behind eye; ear-coverts light olive-brown with whitish streaking; upperparts slightly paler than head, brown-tinged olive, uppertail-coverts and tail rufous; wings olive brown; throat creamy white; underparts pale yellow-brown, washed more olive-brown on breast and, especially, lower flanks, undertail-coverts pale yellowish-tawny; iris light brown, reddish-brown or dark brown; upper mandible blackish, lower mandible whitish-horn, pinkish-grey or grey, cutting edges pale, tip darker; legs pale purplish, flesh, bluish-grey or greenish-grey. Distinguished from similar *P. cabanisi* by being less green both above and below. Sexes alike, female on average smaller than male. Juvenile is as adult, but head concolorous with upperparts, more ginger on tail and uppertail-coverts, tail feathers more pointed, brighter yellow below, including throat. Voice. Burry, nasal chattering; alarm call said to be loud, sharp "tsik-tschirr-tschirr".
Habitat. Gallery forest, riparian thicket in dry *Croton* woodland, forest patches in savanna, secondary forest patches and coffee forest.
Food and Feeding. Little information; eats insects, including orthopterans. Forages mostly at low levels, including on ground, where searches in dead leaves; also recorded higher, including into canopy.
Breeding. Birds in breeding condition recorded in Aug–Sept. No other information.
Movements. No information.
Status and Conservation. Not globally threatened. Poorly known; considered not uncommon overall, but its status is unclear. Reports that it occurs in coastal SW Gabon are unconfirmed. Known to to present in Quiçama National Park, in Angola, but not recorded in other protected areas. Despite its relatively small range, this species' habitat preferences and apparent ability to adapt to secondary habitats suggest that it is unlikely to become threatened in the near future.
Bibliography. Borrow & Demey (2001), Chapin (1953), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Sargeant (1993).

72. **Grey-olive Greenbul**

Phyllastrephus cerviniventris

French: Bulbul vert-olive **German**: Fahlbauchbülbül **Spanish**: Bulbul Verdioliva

Taxonomy. *Phyllostrophus* [*sic*] *cerviniventris* Shelley, 1894, Zomba and Tschiromo, Malawi.
Forms a superspecies with *P. fulviventris*. Birds from SE DRCongo described as race *schoutedeni* on basis of darker and greyer underparts and less rufous tail feathers, but considered not satisfactorily distinguishable. Monotypic.
Distribution. Scattered localities across C & S Kenya, N & E Tanzania, extreme SE DRCongo, N & C Zambia, extreme E Angola, much of Malawi and parts of N Mozambique.



Descriptive notes. c. 18 cm; male 28·5–33 g, female 23·5 g. Medium-sized greenbul with striking orange or yellow eyes and pale legs. Lores are pale grey, side of face and ear-coverts brownish olive-grey with some indistinct paler streaking; indistinct pale broken eyering, darker line on lores and extending behind eye on some individuals; top of head and upperparts olive-grey, tinged brown, paler on lower back and rump; uppertail-coverts and tail rufous; wings olive-brown; throat pale whitish-buff, breast brownish olive-grey, flanks washed tawny, belly creamy buff, undertail-coverts pale tawny; iris orange, orange-yellow, golden-brown, salmon-pink or yellow, red rim; upper mandible dark horn, horn-grey, brownish or pinkish, lower mandible pale horn or whitish, pale cutting edges; legs pinkish-flesh, greyish-white or brownish-white. Distinguished from *P. strepitans* and *P. terrestris* by eye and leg colours; from *P. cabanisi* and *P. fischeri* by smaller size, duller throat, pale legs. Sexes alike; female on average smaller than male, possibly also with eye paler and lacking darker (red or reddish) outer ring of male. Juvenile is browner, less olive, above, secondary coverts edged tawny; eye pale grey, becoming greenish-grey. Voice. Calls include rasping, nasal "yekk-yekk-yekk", "ke-wek, wek wek wark" or continuous "zer-zer-zer-zer", a repeated "cherkiyeck" and a rapid "chewki-chiki-chew-chew".
Habitat. Riparian thicket, gallery forest, groundwater forest, bamboo thicket and moist evergreen forest; from 400 m to 1900 m.
Food and Feeding. Arthropods, including beetles (Coleoptera) and grasshoppers (Orthoptera); also some fruit. Occurs in pairs or small groups; has been recorded in mixed flocks with *P. strepitans*. Shy and unobtrusive. Forages in low tangles of dense vegetation, up to 4 m; gleans from leaves and bark, particularly of fallen logs, from the ground and, occasionally, in aerial sallies. Flicks wings and tail.
Breeding. Nesting recorded in Dec in Kenya, Sept–Nov and Apr (and in breeding condition in Oct) in Zambia, and Apr–May, Aug and Oct–Nov in Malawi; birds in breeding condition and juvenile in Apr in Mozambique. Nest an untidy, fairly deep cup, made of fine rootlets, dead leaves and moss, lined with rootlets, external diameter 10 cm, external depth 5·5 cm. Clutch 2 eggs; no information available on incubation and nestling periods; fledged young out of nest fed by both parents.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally scarce; may be locally fairly common. Known to occur in a number of protected areas.
Bibliography. Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brooks *et al.* (1998), Chapin (1953), Cordeiro *et al.* (1995), Dean (2000), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire & Dowsett (2004), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Mallalieu (2001), Nalianya (2000), Stevenson & Fanshawe (2002), Turner & Zimmerman (1979), Vincent (1935a), Zimmerman *et al.* (1996).

73. **Baumann's Greenbul**

Phyllastrephus baumanni

French: Bulbul de Baumann **German**: Baumannbülbül **Spanish**: Bulbul de Baumann
Other common names: Baumann's Olive Greenbul

Taxonomy. *Phyllostrephus* [*sic*] *baumanni* Reichenow, 1895, Misahohé, Togo.
Has been thought possibly to form a superspecies with *P. hypochloris*, and sometimes considered conspecific, but morphological and vocal differences suggest that they are better treated as distinct species. Also, both sometimes considered to form a superspecies with *P. poensis* and *P. lorenzi*, but this seems implausible, and relationship with latter, at least, of these two does not seem close. Monotypic.
Distribution. NW Sierra Leone and SE Guinea E, apparently discontinuously, to SE Nigeria.



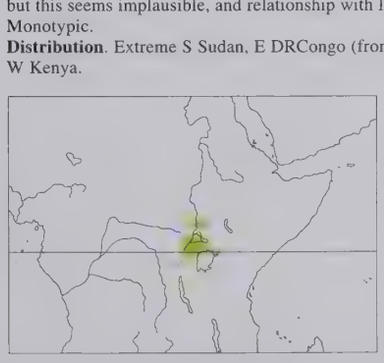
Descriptive notes. c. 18 cm; male 27·5–33 g, female 23·5–26·5 g. Plain bulbul with stout bill, few distinguishing features. Side of head is grey-brown with narrow pale shaft streaking, weakly contrasting indistinct darkish eyestripe from lores to rear of ear-coverts; top of head and upperparts dark olive-brown, rump, uppertail-coverts and tail rather more rusty brown (at most, only weakly contrasting); entirely pale olive-grey below, sometimes washed brownish on breast; iris dark brown, yellow-brown or reddish; bill dark brown above, greyish-horn below, pale cutting edges; legs greyish. Distinguished from *P. albigularis* by brown (not grey) head, olive-brown (not olive-green) upperparts, no contrasting white throat, no yellow tones below. Sexes alike, female on average somewhat smaller than male. Juvenile undescribed. Voice. Calls include series of "week" or "wik" notes, some loud, others fainter, and scolding "cherrr" note. Songs consists of 2–4 slightly nasal, rising notes, "whu whee wheew", followed by some harsh "wik" or "chewik" notes.
Habitat. Habitat preferences appear to be narrow; apparently tied to forest–savanna ecotone across much of its range, entering more deeply into lowland rainforest–secondary grassland mosaic only in far W. Mid-altitude forest and associated clearings and farmbush at 500–1100 m, often on hill and mountain slopes both within and beyond limits of lowland forest zone; also at lower altitudes, down to sea-level, in gallery forest and thicket, including in particular exotic *Lantana* and *Chromolaena*, on fringes of forest zone. Despite reports in the literature, no evidence that it occurs in lowland rainforest.
Food and Feeding. No information on diet; likely to be essentially insectivorous. Usually found in pairs or in small groups of 3–6 individuals; joins mixed-species feeding flocks. Very skulking and shy; forages mainly at or near ground level, occasionally up to 12–15 m. Depresses tail and flicks wings; raises crown feathers when agitated.
Breeding. No information.
Movements. No information; likely resident.
Status and Conservation. Not globally threatened. Data-deficient. Very poorly known; apparently rare, or rarely reported, throughout its wide range. Situation confused by published statements based on incorrect field identification. Known from relatively few localities; given its habitat requirements, however, likely to be more common and widespread than records suggest. Often overlooked or misidentified owing to its skulking behaviour, lack of obvious field characters, and frequent occurrence in degraded habitats. Occurs in some protected areas, including Mont Sangbé National Park, in Ivory Coast, and Bia and Digya National Parks, in Ghana. It is known from the Liberian section of Mt Nimba, and its presence in the newly created Nimba Nature Reserve is likely; expected to occur also in the protected parts of the mountain in Guinea and Ivory Coast. Occurs in Tingi Hills Non-hunting Forest Reserve, in Sierra Leone, Misahöhe Forest Reserve, in Togo, and IITA Forest Reserve, Ibadan, in Nigeria; has recently been found in Pic de Fon and Mont Béro Forest Reserves, in Guinea.
Bibliography. Allen (1930), Bannerman (1921, 1923, 1932, 1936, 1953), Bannerman & Lowe (1923), Bates & Bannerman (1931), Borrow & Demey (2001), Britton (1972), Butchart & Stattersfield (2004), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), Demey (2001, 2002), Demey & Rainey (2004), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood (1977), Elgood & Sibley (1964), Elgood *et al.* (1994), Fishpool (1999, 2000), Fishpool *et al.* (1994b), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Karr (1976), Keith *et al.* (1992), Lowe (1937), Mackworth-Praed & Grant (1973), Marchant (1953), Rand (1951), de Roo (1970), de Roo, de Vree & van der Straeten (1972), de Roo, de Vree & Verheyen (1969), Serle (1950a, 1957), Thiollay (1985).

74. Toro Olive Greenbul

Phyllastrephus hypochloris

French: Bulbul du Toro **German**: Torobülbül **Spanish**: Bulbul de Toro

Taxonomy. *Stelgidillas hypochloris* Jackson, 1906, Kibirau, Toro, Uganda.
Has been thought possibly to form a superspecies with *P. baumanni*, and sometimes considered conspecific, but morphological and vocal differences suggest that they are better treated as distinct species. Further, both sometimes considered to form a superspecies with *P. poensis* and *P. lorenzi*, but this seems implausible, and relationship with latter, at least, of these two does not seem close. Monotypic.
Distribution. Extreme S Sudan, E DRCongo (from Beni area S to Itombwe), W & S Uganda and W Kenya.



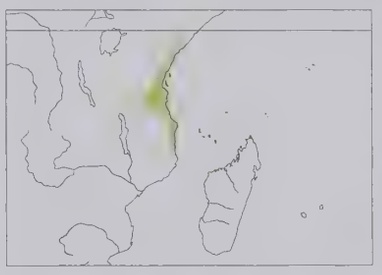
Descriptive notes. c. 17 cm; male 19–30 g, female 17–24 g. Smallish sombre greenbul with few distinguishing features. Entire head, including lores and ear-coverts, is brownish olive-green, appearing flecked (narrow dark fringes), ear-coverts with little streaking, indistinct pale broken eyering; upperparts olive-green, uppertail-coverts and tail dull rufous; wing feathers olive brown; throat pale grey, washed yellow, breast and flanks pale olive-green or yellowish-olive with faint greenish-yellow streaking, belly pale creamy yellow, undertail-coverts dull olive; iris brownish-orange, female rust-brown (Kenya); bill black, pale cutting edges and underside of lower mandible, yellowish gape; legs greenish-grey or bluish-grey. Distinguished from *P. cabanisi* by dark eye, duller plumage above and below, more uniformly olive on breast, pale throat less contrasting. Sexes alike, female on average smaller than male. Juvenile has head and underparts paler, light rufous undertail-coverts, bill dark brown. Voice. Song begins with several emphatic, raspy "whee-oo whéé" notes, usually followed by loud, scolding, descending "shree-shree-shree-shree".
Habitat. Evergreen and semi-deciduous forest. Usually in dense undergrowth and scrub at forest edge, beside rivers, and around clearings and adjacent farmbush, rather than deep within forest. Lowlands and middle altitudes, up to 1440 m in DRCongo, to 1600 m in Sudan, and to 2400 m in Uganda.
Food and Feeding. Largely insectivorous, but also some fruit. Found in pairs or in small (family?) groups; occasionally joins mixed-species flocks. Extremely skulking, forages in dense undergrowth, on low branches, tangles of dead leaves, fallen wood, creepers, etc.; mainly low down, occasionally ascending to middle levels. Wags tail slowly up and down, flicks wings.
Breeding. Birds in breeding condition in May in Sudan and in Dec–Mar in DRCongo (Itombe); pair seen while nest-building in creeper-clad tree. No other information.
Movements. No information; likely resident.
Status and Conservation. Not globally threatened. Locally common, but generally considered to be rare; probably under-recorded owing to its skulking behaviour and poorly known vocalizations. Known from several protected areas, including Virunga National Park, in DRCongo, and Bwindi-Impenetrable Forest, Kibale Forest, Semliki and Mount Elgon National Parks, in Uganda, Imatong Mountains Forest Reserve, in Sudan, and Kakamega Nature Reserve, in Kenya.
Bibliography. Bennun (1994), Britton (1972, 1980), Byaruhanga *et al.* (2001), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Dehn & Christiansen (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Friedmann & Williams (1969, 1971), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1973), Mann (1985), Nikolaus (1987, 1989), Prigogine (1971, 1978, 1980b, 1984), Schouteden (1957), Stevenson & Fanshawe (2002), Turner & Zimmerman (1979), Zimmerman (1972), Zimmerman *et al.* (1996).

75. Fischer's Greenbul

Phyllastrephus fischeri

French: Bulbul de Fischer **German**: Fischerbülbül **Spanish**: Bulbul de Fischer

Taxonomy. *Criniger Fischeri* Reichenow, 1879, Muniuni, near mouth of Tana River, Kenya.
Forms a superspecies with *P. cabanisi*; has in the past been treated as conspecific, but differs in morphology (plumage, eye colour, bill structure) and voice, and the two recently found to occur together in Tanzania (parts of the Udzungwas). Has also been suggested that both form a superspecies with *Pyrrhurus scandens* (which sometimes included in present genus), but relationship seems remote. Biometric data for present species indicate a N–S cline of increasing size and weight. Monotypic.
Distribution. Extreme S Somalia (lower R Jubba), coastal Kenya (extending inland along lower R Tana and to Rabai and Shimba), E Tanzania (coastal region, inland to E Usambaras, E Ulugurus and Udzungwas) and NE Mozambique.



Descriptive notes. 17–18 cm; male 29–39 g, female 22–33 g. A distinctive white-throated, pale-eyed greenbul. Lores and ear-coverts are light olive-brown, some light streaking on ear-coverts, inconspicuous narrow white broken eyering; top of head and upperparts brownish-olive, rump, uppertail-coverts and tail dull rufous; wings greenish-brown; throat white, contrasting with greyish or brownish-olive breast and flanks, lower breast with some creamy-yellow streaks, belly creamy white to yellowish, undertail-coverts pale brown; iris white, cream, yellowish or tan; bill black or brownish-black, paler cutting edges; legs grey, tinged bluish or flesh. Distinguished from *P. cabanisi* by eye colour, white (not creamy) throat, also by voice; from *P. terrestris* and *P. strepitans* by pale eye, more olive coloration. Sexes alike, female on average smaller than male and with bill shorter and less fine. Juvenile resembles adult, but upperparts, breast and flanks darker, belly more yellow, eye grey. Voice. Calls include harsh scolding "churr" notes and explosive "pidi-tit"; contact call "prurrit prurrit"; other vocalizations include dry chattering "cherrrrh-cherrrh-cherrrh", sharper "chicck-chiccck-chiccck" and repeated rapid descending "chweeeeeeeeoh, chreeeeeeeeoh". The "churr" often quickens into distinctive phrase of 4–5 notes in which first note longest, loudest and highest, following notes on descending scale, "wréé-ga-ga-ga-ga", often answered by a neighbour.
Habitat. Lowland evergreen forest (including small patches is savanna), dense woodland and coastal thicket; mainly below 300 m, but in Tanzania reaching 750 m in Usambaras and Udzungwas and 850 m in Ulugurus.
Food and Feeding. Arthropods. Found in pairs or in small groups of 3–7 individuals; sometimes joins mixed flocks, and recently found in parts of Udzungwa Mts (Tanzania) in mixed-species flocks with *P. cabanisi*, but more often in single-species flocks. Unobtrusive and shy. Forages at low levels in dense tangles and on the ground; gleans from vegetation and by turning over leaf litter. Flicks tail and wings.
Breeding. Birds in breeding condition in Apr and Dec in Kenya, and in Jan–May and Oct–Nov (from beginning of short rains until end of long rains) in Tanzania. No other information.
Movements. No information.
Status and Conservation. Not globally threatened. Common to abundant over much of its range. No recent records from Somalia, possibly now extinct. No recent information from N Mozambique. Protected in Arabuko-Sokoke and Shimba Hills Forest Reserves, in Kenya; in Tanzania, occurs in the Selous Game Reserve as well as numerous forest reserves.
Bibliography. Ash & Miskell (1983, 1998), Britton (1972, 1980), Brown & Britton (1980), Dowsett (1972), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Hall & Moreau (1970), Jackson & Sclater (1938), Jensen & Brøgger-Jensen (1992), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Mlingwa (1996a), Stevenson & Fanshawe (2002), Svendsen & Hansen (1995), Turner & Zimmerman (1979), Zimmerman *et al.* (1996).

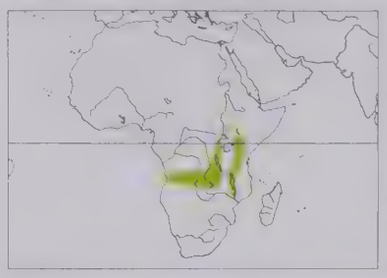
76. Cabanis's Greenbul

Phyllastrephus cabanisi

French: Bulbul de Cabanis **German**: Cabanisbülbül **Spanish**: Bulbul de Cabanis
Other common names: Kenya Highlands/Olive Mountain/Shelley's/Placid Greenbul (*placidus*)

Taxonomy. *Criniger cabanisi* Sharpe, 1882, Angola.
Forms a superspecies with *P. fischeri*; has in the past been treated as conspecific, but differs in morphology (plumage, eye colour, bill structure) and voice, and the two recently found to occur together in Tanzania (parts of the Udzungwas). Has also been suggested that both form a superspecies with *Pyrrhurus scandens* (which sometimes included in present genus), but relationship seems remote. Race *placidus* sometimes treated as a separate species on grounds of differences in size, coloration and habitat; studies have shown, however, that its vocalizations are very similar to those of nominate (in Malawi, reacts strongly to playback of nominate from Zambia). Additional Kenyan races *nandensis* (from N Nandi Forest) and *ngurumanensis* (Nguruman Range) treated as synonyms of *sucosus*, as differences in coloration on which descriptions were based are small and within range of variation of last-mentioned (although birds from Nandi rather greener above, with yellow margins of flight-feathers). Three subspecies recognized.

Subspecies and Distribution.
P. c. sucosus Reichenow, 1903 – extreme S Sudan, Kenya (W of Rift Valley), N, SW & E Uganda, E DRCongo (S to Mt Kabobo), Rwanda and NW Tanzania.
P. c. cabanisi (Sharpe, 1882) – NC Angola, SE DRCongo, N Zambia (except extreme NW) and W & SW Tanzania (S to Ufipa).
P. c. placidus (Shelley, 1889) – Kenya (E of Rift Valley), N, E & S Tanzania (W to Rungwe in S), extreme NE Zambia (Mafinga Mts), Malawi and NW Mozambique.



Descriptive notes. 16·5–19 cm; male 33–42 g, female 27–39 g (*cabanisi*), male 22–31 g, female 19–26 g (*sucosus*), male 21–32 g, female 19–31 g (*placidus*). A large long-tailed, slender-billed greenbul. Nominate race has lores and ear-coverts greyish olive-green, ear-coverts with faint paler streaking, narrow pale broken eyering, indistinct darker line in front of and behind eye; top of head and upperparts olive-green, uppertail-coverts and tail bright rufous, wings olive-green; throat and underparts yellowish, side of neck, breast and flanks washed greenish-olive, undertail-coverts pale brown; iris pale greyish-tan or pale grey; bill dusky horn, paler cutting edges; legs bright blue-grey. Distinguished from *P. fischeri* by yellower throat, from *P. cerviniventris* by bare-part colours, from both also by voice. Sexes alike, female on average smaller than male. Juvenile is bright olive above, pale yellow below, more olive on flanks and breast, bill black with yellow tip, eye pale olive-brown, feet greenish-grey. Race *sucosus* is smaller than nominate, brighter yellow below; *placidus* is also smaller, and browner overall, olive-brown above, throat creamy white, breast and flanks greyish-olive, bill horn-brown to horn-grey or yellowish-grey, paler base of lower mandible, eye brown, grey or dull yellowish-grey, legs slate-coloured. Voice. Race *placidus* contact call a harsh, low grating "churr" or "prrp-prrp"; song often in duet, one individual giving "churr", the other a whistled series of continuous double notes, "chirry, chorry, chirry, chorry" or "chrrrk, chrrrk, chrrrk-chrrrk, chwert-chwert", single bird may also sing unaccompanied; male call in pre-copulatory display a low "pruit-pruit-pri-pri, pri-pri-cho" or "prrp-prrp-perrup-perrup"; alarm a high-pitched "squii, squii" or " ziew-ziew-ziew". Voice of nominate very similar.
Habitat. Lowland, mid-altitude and montane primary and secondary forest of various types, gallery forest, riparian thicket, and dense woodland. Race *placidus* in Eastern Arc mountains of Tanzania commonest at c. 1500 m, ranges from 600 m in Usambaras (Tanzania) to 2000 m in Sudan, 2700 m in E Africa; nominate to 1700 m in Zambia; *sucosus* to 2400 m in Rwanda (Nyungwe).
Food and Feeding. Arthropods, including grasshoppers (Orthoptera), beetles (Coleoptera), mantids, caterpillars, ants (Hymenoptera), spiders (Araneae); also molluscs, some fruit. Found in pairs or in small groups of up to six individuals; sometimes joins mixed flocks, and recently found in parts of Udzungwa Mts (Tanzania) in mixed-species parties with *P. fischeri*, but seen more often in monospecific groups. Shy but inquisitive. Usually forages low down in dense undergrowth, on vertical to horizontal perches and on the ground, only occasionally moving higher than c. 2–4 m; rarely above 2 m where *P. flavostriatus* present, but in high forest where latter is absent regularly forages to 6–7 m above ground, sometimes to 16 m. Sometimes attends *Dorylus* ant swarms, but does not follow them into open understorey; remains within dense undergrowth. Gleans items from the ground among leaf litter, fallen wood, moss, also from leaves and from tree trunks, where it clings to bark while fluttering wings; also makes occasional short sallies. Flicks tail and wings, one wing at a time.
Breeding. Nesting recorded in Dec–Jan, Mar–May and Jul (thought to occur all year) in DRCongo, Dec–Mar in Sudan, Sept–Jan in Rwanda, and Dec–Aug (mainly in rains) in E Kenya and NE Tanzania; birds in breeding condition in Jun and Aug–Sept in Angola and Oct–Dec in Uganda; Oct–Feb (and juveniles also Sept) in Malawi, and Mar, Jul and Aug–Oct (breeding condition also Oct–Nov) in Zambia; double-brooded. Monogamous. Male in pre-copulatory display intermittently flicks wings and fans tail, erects crown feathers and fluffs throat and rump feathers, while hopping in circle through undergrowth while making low bubbling call. Nest, built by both sexes in 7–10 days, a shallow, elliptical cup of dead leaves, bark fibres, moss, tendrils, etc., bound together with cobwebs, outer layer with dead leaves and bark as camouflage, the whole appearing as bunch of trapped leaf debris, one measured 8·9 × 6·4 cm externally, 5·7 × 4·4 cm internally, outside depth 5·1 cm, inside depth 1·9 cm; placed 1·5–5 m above ground in vertical or lateral fork in dense undergrowth or low bush. Clutch 2 eggs, sometimes 3; incubation by both sexes, mainly female, period 11–12 days, longer in cold weather; nestling period 16–18 days; when surprised at nest, sitting bird may drop to ground and feign death, with wing half open, head limp, if approached will repeatedly stagger a few metres, trailing a wing and with spread tail, before collapsing.
Movements. Resident. One territory in Malawi was occupied by same group of birds for at least seven years, but some local altitudinal movement also recorded in that country.
Status and Conservation. Not globally threatened. Common and widespread. In Tanzania, density of 120 individuals/100 ha recorded Udzungwa Mts, and another study in Eastern Arc range reported a maximum density c. 25 individuals/km². Well represented in protected areas.
Bibliography. Bennun (1994), Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brown & Britton (1980), Carswell (1986), Chapin (1953), Cordeiro (1994a), Cordeiro & Kiure (1995), Dean (2000), Dickinson, E.C. (2003), Dinesen (1997), Dowsett (1972, 1990), Dowsett & Dowsett-Lemaire (1980, 1993), Dowsett & Forbes-Watson (1993), Dowsett & Prigogine (1974), Dowsett *et al.* (2004), Dowsett-Lemaire (1989), Dowsett-Lemaire & Dowsett (2004), Hall & Moreau (1970), Jackson & Sclater (1938), Jensen & Brøgger-Jensen (1992), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Moyer (1993), Nikolaus (1987, 1989), Romdal (2001), van Someren (1956), Stevenson & Fanshawe (2002), Turner & Zimmerman (1979), Willis (1983), Zimmerman (1972), Zimmerman *et al.* (1996).

77. Cameroon Olive Greenbul

Phyllastrephus poensis

French: Bulbul olivâtre **German**: Bamendabülbül **Spanish**: Bulbul de Fernando Póo

Taxonomy. *Phyllostrophus* [*sic*] *poensis* Alexander, 1903, Bakaki, Bioko (Fernando Póo).
Affinities unclear. Has been suggested that it forms a superspecies with *P. baumanni*, *P. hypochloris* and *P. lorenzi*, but relationships with these species, especially the last-mentioned, seem remote. Monotypic.
Distribution. Highlands of SW Nigeria (Obudu and Mambilla Plateaux) and CW Cameroon (Tchabal Mbabo S to Mt Cameroon), and Bioko I.
Descriptive notes. c. 18 cm; male 28–32 g, female 24–25 g. Medium-sized, relatively long-tailed, plain-looking greenbul with relatively long and fine bill. Lores and side of face are grey with some



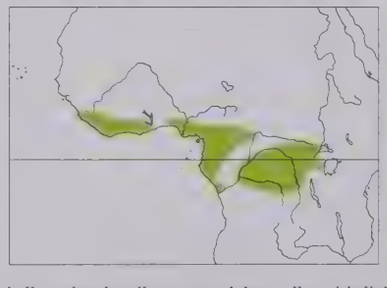
paler streaking on ear-coverts, indistinct pale grey broken eyering, faint darker line running through eye. Crown and upperparts, including wings, olive-brown, uppertail-coverts and tail dark rufous; throat dirty white, breast and flanks pale olive-brown, belly pale with some yellowish-white streaking, undertail-coverts pale rufous-brown; iris dark brown or chestnut; bill black, paler cutting edges; legs blue-grey. Sexes alike, female on average smaller than male. Juvenile has chestnut wash on upperparts, dull brownish band across breast, some rusty feathers on belly, flanks and undertail-coverts. Voice. Song a series of unmusical notes, "chewp chop chop chip chewp chip cher", and loud, scolding "kweep-kweep-kwerr-kweep-krr-kweep". Call a low "tchrr-tchrr-tchrr".
Habitat. Mid-altitude and montane forest between 750 m and 2200 m.
Food and Feeding. Insectivorous; some fruit also eaten. Occurs in pairs or small (family?) groups; regularly joins mixed-species parties e.g. at *Dorylus* ant swarms. Generally shy and unobtrusive. Forages in thick undershrubs and lianes, keeping to dense vegetation for most of the time, occasionally moving higher into upper levels. Gleans from leaves, tree trunks and branches. Depresses tail and flicks wings.
Breeding. Nesting recorded in Nov–Apr (mainly Nov–Jan, in dry season) in Cameroon, in Dec (and immature noted in Jun) in Nigeria, and Nov in Bioko. Nest an open cup of loose moss, leaf skeletons and leaves, intermediate layer of tendrils and lining of fibres, external diameter 8·5 cm, depth 9 cm, internal diameter 5·5 cm and cup depth 4 cm; c. 1·5 m above ground in low bush, attached by cobwebs to two or three moss-covered twigs, well camouflaged with moss. One nest had clutch of 2 eggs; no information on incubation and nestling periods.
Movements. No information.
Status and Conservation. Not globally threatened. Restricted-range species: present in Cameroon Mountains EBA. Fairly widespread and not uncommon within its small range; recently rediscovered to be not uncommon on Bioko, after many decades without any records. Occurs in a number of protected areas, including Basilé Peak National Park, in Bioko, Gashaka-Gumti Reserve, in Nigeria, and Banyang-Mbo Wildlife Sanctuary and Mount Oku Community Forest Reserve, in Cameroon; also present in other forest reserves in Cameroon.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Bowden (2001), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1998b, 2001a, 2001b), Eisentraut (1963, 1973), Elgood *et al.* (1994), Fishpool & Evans (2001), Fotso (1996), Hall & Moreau (1970), Keith *et al.* (1992), Larison *et al.* (2000), Louette (1981), Mackworth-Praed & Grant (1973), Pérez del Val (1996), Serle (1954), Stattersfield *et al.* (1998), Stuart (1986).

78. Icterine Greenbul

Phyllastrephus icterinus

French: Bulbul ictérin **German**: Zeisigbülbül **Spanish**: Bulbul Icterino
Other common names: Lesser Icterine Greenbul

Taxonomy. *Trichophorus icterinus* Bonaparte, 1850, Guinea.
Sibling species of *P. xavieri*, widely sympatric and very similar in appearance; difficulties in distinguishing the two have in the past led to some taxonomic confusion, and continue to hinder understanding of their respective distributions and ecologies. Relationship with *P. lorenzi* requires analysis; the two are almost entirely sympatric, closely similar in structure, overlap in dimensions, and appear also to intergrade in crown colour; latter is possibly a melanistic form of present species. Birds in E of range (Cameroon E to Uganda) described as race *tricolor*, on average somewhat greener above and duller yellow below, but not satisfactorily distinguishable as similarly coloured specimens occur elsewhere in species' range. Monotypic.
Distribution. W Sierra Leone and SE Guinea E to Ghana (one record Togo), and from SW Nigeria and Bioko E to SW Central African Republic and S to Gabon, W PRCongo, N Angola (Cabinda) and extreme W DRCongo (Mayombe); also across most of central DRCongo (S to S to Kasai and Kivu) and E to parts of W & S Uganda and extreme NW Tanzania.



Descriptive notes. 15–16 cm; 16·5–24·5 g, 15–22 g. Small, slender greenbul with conspicuous yellow throat. Lores and ear-coverts are pale olive-green with some yellowish streaking; inconspicuous yellowish eyering, obscure greenish-yellow line extending from in front of eye to a little way behind it (forming ill-defined supercilium); top of head and upperparts dull olive-green, uppertail-coverts and tail dull rufous; greater and median upperwing-coverts and flight-feathers dull olive-brown; throat sulphur-yellow, side of breast and flanks pale greenish or yellowish-olive, centre of breast yellow with olive wash, lower breast, belly and undertail-coverts sulphur-yellow; iris light brown or grey-brown; bill black or brownish-black above, grey or greenish-grey below, pale cutting edges and tip, yellow gape; legs bluish-grey or bluish-green. Distinguished from extremely similar *P. xavieri* by slightly smaller size and weaker bill, and in parts of range slightly brighter uppertail-coverts and tail; reliably separated in the field only by voice. Sexes alike, female on average smaller than male. Juvenile is greener above, breast and throat washed brownish. Voice. Song an unobtrusive, fast nasal chattering, slowing towards end, "chirrrup-chup-chup-chup-chup-chup"; alarm a nasal trill.
Habitat. Primary and old secondary evergreen and semi-deciduous forest, swamp-forest, forest–savanna mosaic; mostly in forest interior, infrequently coming to edge habitats. Mainly in lowlands, but recorded up to 900 m in Liberia, 1260 in Cameroon, 1250 m in Uganda and 1430 m in DRCongo.
Food and Feeding. Arthropods, including orthopterans, neuropterans, mantids, bugs (Hemiptera), beetles (Coleoptera), moths (Lepidoptera), caterpillars, termites (Isoptera), ants (Hymenoptera), spiders (Araneae); also some fruit and seeds. Usually occurs in small family groups of 3–5 individuals, thought to comprise a pair and previous brood (in Gabon, one bird ringed as a juvenile was recaptured 10 months later still with same two adults); groups of up to15 also recorded. Fairly shy. Forages in undergrowth and low bushes, mainly at 2–15 m (Liberia), 1–20 m (PRCongo). Gleans items from small branches, twigs, leaves, dense tangles, often flying after disturbed prey. Very

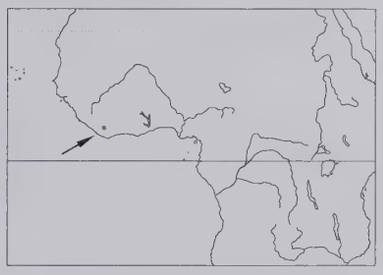
common component of mixed-species flocks, in which it may play role of leader, attracting other species to discovered food sources. Often, however, a follower, including of diurnal mammals, such as squirrels and small antelopes, capturing insects disturbed by the mammals' movements. Sometimes attends *Dorylus* ant swarms.
Breeding. Pair collecting nest material in Oct, fledglings Oct–Nov and independent juveniles Dec–Mar and May in Liberia; begging juveniles in May, Jul and Oct in Ivory Coast; in breeding condition in Sept in Ghana and Nov in Bioko; nest-building in Jan in Nigeria, and eggs in Jan, Jun and Sept and dependent fledglings Dec–Feb in Cameroon; nests with eggs Oct–Apr and newly fledged young Jun and Aug (probably breeds all year, with peak at end of rainy season and in short dry season) in Gabon; breeds all year in DRCongo; in breeding condition in Uganda in Jan–Feb. Monogamous; pair-bond long-lasting, both members of pair captured in same net in Gabon on several occasions, up to 61 months after ringing. Territorial, territory defended mostly by song, also by display with spread wings and tail, occasionally by fighting. Nest a small cup of dried leaves, a few twigs and rootlets, bound together by and sometimes also lined with hyphae of *Marasmius* fungus, outside camouflaged with dead leaves, external diameter 5–9 cm, depth 4–7 cm, internal depth 3–6 cm; suspended in hammock fashion, using cobwebs and *Marasmius*, 0·65–11 m above ground near end of horizontal branch of bush, shrub or liane, either in full view or hidden under large leaf. Clutch 2 eggs, rarely 1; incubation by female, when surprised she may fall to ground and perform distraction display, resembling running rodent, incubation period 14 days; chicks fed by both parents, leave nest after 12 days when still unable to fly, remain hidden in cover, where fed by parents; after 20–25 days, young join adults in mixed flocks. Of 38 nests watched in Gabon, 27 were preyed on, eight of remaining eleven each produced one young only (one egg infertile in four cases, one young disappeared in three).
Movements. Resident. Of 64 birds ringed in Gabon, 36 recaptured at least once at same site over period of up to 90 months; individuals observed up to 800 m from site of ringing.
Status and Conservation. Not globally threatened. Widespread, and generally common to abundant. Densities of up to 25–30 groups/km² in Gabon, 1 bird/5 ha in Nigeria, and 1 bird/ha in optimal habitat in N PRCongo. Occurs in many national parks across its large range, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Korup, in Cameroon, Nouabalé-Ndoki, in PRCongo, Salonga, in DRCongo, and Semliki, in Uganda.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Chapin (1953), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991, 2001a), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Friedmann (1968), Gatter (1997), Germain & Cornet (1994), Grimes (1987), Hall & Moreau (1970), Jackson & Sclater (1938), Johnson, D.N. (1989), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Pérez del Val (1996), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985), Willis (1983).

79. **Liberian Greenbul**

Phyllastrephus leucolepis

French: Bulbul du Libéria **German**: Fleckflügelbülbül **Spanish**: Bulbul de Liberia
Other common names: Spot-winged Greenbul

Taxonomy. *Phyllastrephus leucolepis* Gatter, 1985, 20 km NW of Zwedru, near Cavalla River, Grand Gedeh County, Liberia.
Status unclear; relationship with *P. icterinus*, to which it is identical except for whitish spots on wings, requires investigation. Monotypic.
Distribution. Two forest patches 20 km NW of Zwedru, in E Liberia.



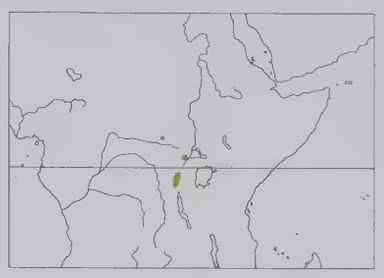
Descriptive notes. c. 16 cm. Small greenbul with yellow throat. Lores and ear-coverts are palish olive-green with some yellowish streaking, inconspicuous yellowish eyering; top of head and upperparts dull olive-green, uppertail-coverts and tail dull rufous; wings dull olive-brown, subterminal row of whitish spots (7–12 mm broad) on flight-feathers, another subterminal row of spots (3–4 mm broad) on greater wing-coverts, greater and median primary coverts and alula; throat and underparts sulphur-yellow, breast and flanks washed olive; eye colour not documented; bill black above, dark horn below, pale cutting edges and tip; legs pale grey. Distinguished from otherwise identical *P. icterinus* by spots on wing. Sexes probably similar. Juvenile undescribed. Voice. Unknown.
Habitat. Forest in transition zone between evergreen and semi-deciduous types.
Food and Feeding. Little information. Observed singly or in pairs; joins mixed-species flocks. Forages mainly between 4 m and 8 m, often in branches close to trunk; reported as flicking both wings, held partly open, simultaneously, this thought to act as a visual signal.
Breeding. No information.
Movements. No information; likely resident.
Status and Conservation. CRITICAL. Restricted-range species: present in Upper Guinea Forests EBA. Known only from the damaged type specimen (sex unknown), and from other individuals seen in same localities by the collector of the type. Forest in the type locality is unprotected and highly fragmented; logging is continuing, and the cleared land being settled for smallholder agriculture. Civil unrest in the area has undoubtedly added to the short-term exploitation of these resources.
Bibliography. Allport (1991), Borrow & Demey (2001), Butchart & Stattersfield (2004), Collar & Andrew (1988), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Gatter (1985, 1997), Keith *et al.* (1992), Morel & Chappuis (1992), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

80. **Sassi's Olive Greenbul**

Phyllastrephus lorenzi

French: Bulbul de Lorenz **German**: Lorenzbülbül **Spanish**: Bulbul de Lorenz
Other common names: Sassi's/Lorenz's Greenbul

Taxonomy. *Phyllastrephus lorenzi* Sassi, 1914, Moera, near Beni, eastern DRCongo.
Taxonomic status unclear; vocal and molecular data needed. Has been suggested that it forms a superspecies with *P. baumanni*, *P. hypochloris* and *P. poensis*, but affinities with these seem remote. Relationship with *P. icterinus* requires analysis; the two are almost entirely sympatric, closely similar in structure, overlap in dimensions, and appear also to intergrade in crown colour; possibly a melanistic form of that species. Monotypic.
Distribution. Scattered localities in NE & E DRCongo; one record from extreme W Uganda (Bwamba).



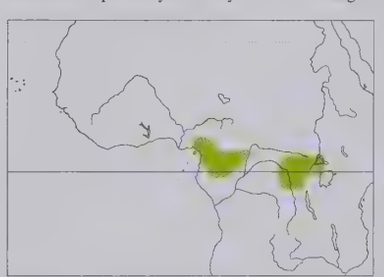
Descriptive notes. c. 15–16 cm; one female 19 g. A small greenbul with distinctive black cap. Lores and ear-coverts are dull olive, some faint darker streaking on ear-coverts, inconspicuous narrow olive eyering, obscure dirty yellowish line from in front of eye to a little way behind it (vague supercilium); forehead olive-brown, forecrown to nape variably mottled black and olive, blackest on crown, sometimes appearing as well-defined black cap, sometimes merely as less distinct darker area; upperparts dark dull olive-brown, uppertail-coverts slightly more rufous, tail dark reddish-brown; wings blackish-brown, outer margins of primaries light greenish-brown, bend of wing olive-yellow; throat olive-yellow, underparts dirty yellowish olive-green, paler olive-yellow in centre of belly, undertail-coverts brownish-yellow; two aberrant museum specimens with irregular warm brown patches on crown, mantle, back, wing-coverts, breast side and lower flanks; iris dark brown; bill blackish-brown, paler lower mandible, cutting edges and tip; legs greyish, greyish-brown or blackish. Distinguished from *P. icterinus* by darker overall coloration, black cap diagnostic. Sexes alike, female on average smaller than male. Juvenile said have blackish area on crown poorly developed. Voice. No information.
Habitat. Primary forest at c. 600–1580 m; record at 1820 m requires confirmation. Not recorded from secondary habitats.
Food and Feeding. Little information; likely to be mainly insectivorous. Occurs in small groups in lower and lower-middle strata; joins mixed-species flocks.
Breeding. Birds in breeding condition in Jan, Mar–May and Aug. No other information.
Movements. No information.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Eastern Zaïre Lowlands EBA. Poorly known. Recorded from Kibali-Ituri District (from Bondo Mabe and Irumu S to Beni, including Ituri and Semliki forests), with a single record just over the border in Uganda (at Bwamba); in South Kivu, one record from Hombo (W of Mt Kahuzi) and another from around Kamituga (Itombwe); also, a single record from Bambesa, in Uele District. Potentially threatened by clearance of habitat for shifting cultivation, and degradation through the removal of understorey trees to create cocoa plantations; situation exacerbated by this species' apparent inability to tolerate secondary habitats. Has been recorded from Kahuzi-Biéga National Park, Okapi Faunal Reserve and Mount Hoyo Reserve, but the degree to which its habitat can currently be considered protected is questionable.
Bibliography. Britton (1972, 1980), Butchart & Stattersfield (2004), Byaruhanga *et al.* (2001), Chapin (1953), Dowsett (1985a), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Friedmann & Williams (1968), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Mackworth-Praed & Grant (1973), Plumptre (1997), Plumptre & Mutungire (1996), Prigogine (1971, 1978, 1980b, 1984, 1985), Schouteden (1957), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002).

81. **Xavier's Greenbul**

Phyllastrephus xavieri

French: Bulbul de Xavier **German**: Xavierbülbül **Spanish**: Bulbul de Xavier
Other common names: Greater Icterine Greenbul

Taxonomy. *Xenocichla Xavieri* Oustalet, 1892, Bangui, on Ubangi River, Central African Republic.
Sibling species of *P. icterinus*, widely sympatric and very similar in appearance; difficulties in distinguishing the two have in the past led to some taxonomic confusion, and continue to hinder understanding of their respective distributions and ecologies. Birds from Cameroon (N & W of Mt Cameroon) described as race *serlei* on basis of paler and duller yellow underparts, with darker olive wash on breast, but these characters fall within range of variation of the species elsewhere. Monotypic.
Distribution. Extreme SE Nigeria and W Cameroon E to SW Central African Republic, S to C Gabon and NE PRCongo; also EC DRCongo E to W & S Uganda and extreme NW Tanzania. Distribution probably not fully resolved owing to confusion with *P. icterinus*.



Descriptive notes. 16–18 cm; male 23–31 g, female 16–22 g. Smallish greenbul with conspicuous yellow throat. Has lores and ear-coverts pale olive-green with some yellowish streaking, inconspicuous yellowish eyering, obscure greenish-yellow line extending from in front of eye to a little way behind it (ill-defined supercilium); top of head and upperparts dull olive-green, uppertail-coverts rufous sometimes with greenish wash, tail dull rufous; greater and median upperwing-coverts and flight-feathers dull olive-brown; throat sulphur-yellow, side of breast and flanks pale greenish or yellowish-olive, centre of breast yellow with olive wash, lower breast, belly and undertail-coverts sulphur-yellow; iris dark brown, light brown or pale grey; bill black or dark brown above, light grey or greenish-grey below, pale cutting edges and tip, yellow gape; legs bluish-grey, brown, pale mauve-brown or flesh. Distinguished from extremely similar *P. icterinus* by slightly larger size and heavier bill, and in parts of range slightly duller uppertail-coverts and tail; reliably separated in the field only by voice. Sexes alike, female on average smaller than male. Juvenile is greener above, paler below, more olive on breast. Voice. Short, nasal "kwah, kwah, kwah…kwahkwah" and more drawn-out, squeaky "kwèèèh" or "kèèh", uttered in shorter or longer series of either similar or combined notes, "kwah-kèèh".
Habitat. Primary and old secondary evergreen and semi-deciduous forest, and swamp-forest; occurs both in forest interior and, to lesser extent, in edge habitats. Mainly lowlands, but recorded to 900 in Cameroon, 1500 m in Uganda and 1470 m in DRCongo.

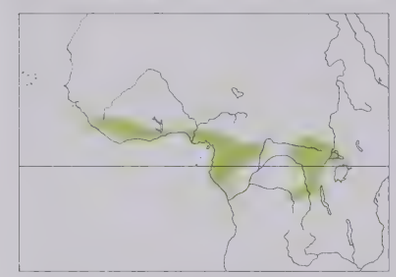
Food and Feeding. Arthropods, including orthopterans, beetles (Coleoptera), moths (Lepidoptera), caterpillars, mantids, spiders (Araneae); also some fruit and seeds. Usually found in pairs or in family groups of 4–6 individuals; regular member of mixed-species flocks, often with *P. icterinus*. Appears to forage at most levels, in Gabon reportedly mainly from 15 m up to canopy; elsewhere, said to be found more often in understorey. Gleans from leaves, tangles and similar sites; pursues disturbed prey in flight.
Breeding. Birds in breeding condition in Jan–Mar and Aug and dependent fledglings in Jan–Feb in Cameroon; nest thought to be of this species found in Feb in Gabon; in DRCongo, nesting recorded Nov–Jun in Itombwe, probably breeds throughout year at equator; in breeding condition Feb, Apr and Jun–Jul and juvenile in May in Uganda. Territorial. Nest a cup of dry leaves lined with rootlets, external diameter 8 cm, depth 5·5–6 cm, internal depth 3·5–4 cm, built 1–2·5 m above ground in fork of thin branch, or placed between two small branches, in bush in dense undergrowth. Clutch 2 eggs; no information on incubation and nestling periods.
Movements. Resident, so far as known. Ringed individual in Gabon retrapped at same site after 68 months.
Status and Conservation. Not globally threatened. Status obscured owing to confusion with the more widespread and common *P. icterinus*; considered locally common to uncommon. Occurs in many protected areas across its large range, including Korup National Park, in Cameroon, Nouabalé-Ndoki National Park, in PRCongo, Okapi Faunal Reserve, in DRCongo, and Semliki National Park, in Uganda.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Bowden (2001), Britton (1972, 1980), Brosset & Érard (1986), Chapin (1953), Christy & Clarke (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991, 2001a), Fishpool & Evans (2001), Friedmann (1968), Germain & Cornet (1994), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Manu & Demey (1999), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Smith *et al.* (1996), Stevenson & Fanshawe (2002).

82. White-throated Greenbul

Phyllastrephus albigularis

French: Bulbul à gorge blanche **German**: Schuppenstirnbülbül **Spanish**: Bulbul Gorgiblanco

Taxonomy. *Xenocichla albigularis* Sharpe, 1882, Fantee, Ghana.
Distinctive species of unclear affinities; not obviously closely related to any other member of genus. Two subspecies recognized.
Subspecies and Distribution.
P. a. albigularis (Sharpe, 1882) – SW Senegal, and Sierra Leone and SE Guinea E through C Nigeria to SW Central African Republic and S to S PRCongo; also NW, W & E DRCongo (Duma, lower R Congo at Kunungu, and E from Sankuru and Kasai), SE Central African Republic, extreme S Sudan, and NW, W & C Uganda.
P. a. viridiceps Rand, 1955 – NW Angola (Cuanza Norte, N Cuanza Sul).



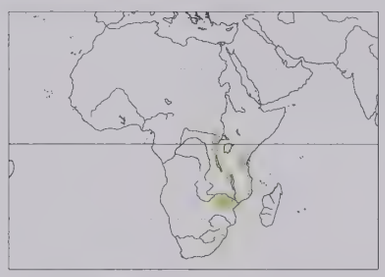
Descriptive notes. c. 17 cm; male 24–31 g, female 17–28 g. Small pale-eyed greenbul with relatively long, dagger-like bill. Nominate race has head and neck olive-grey, darker feather fringes producing scaly appearance; lores and periorbital area grey (paler than crown), ear-coverts slightly darker grey-brown with some paler streaks and darker fringes (appearing scaly, like rest of head); upperparts, including wings, dark olive-green, uppertail-coverts and tail olive-rufous; throat white, breast and flanks olive-green to olive-grey, lower breast and belly pale yellow, deeper yellow on lower belly and yellow-olive on undertail-coverts; iris dirty white, pale grey or cream; bill black, dark blue-horn or dark grey, yellowish cutting edges and tip, lower mandible paler on underside; legs grey or bluish-flesh. Sexes alike, female on average smaller than male. Juvenile resembles adult, but with yellow gape, light brownish-grey eyes. Race *viridiceps* has crown washed green, upperparts on average greener than nominate, throat washed pale yellowish-buff, underparts on average yellower, eyes greyish-brown. Voice. A series of rapid, clear scolding notes, usually rising in pitch and then dying way, usually preceded by loud "turrr'. Contact calls include low, monotonous "prrp-prrp", "trr-trrp" or "prrchurrup".
Habitat. Primary and old secondary forest and gallery forest; in W of range at least, more common in drier, semi-deciduous forest than in wetter forest types. Favours edge habitats rather than forest interior. Lowlands, to 1000 m in Liberia and 1850 m in Uganda.
Food and Feeding. Arthropods, including orthopterans, neuropterans, bugs (Hemiptera), beetles (Coleoptera), moths and their caterpillars (Lepidoptera), ants (Hymenoptera), spiders (Araneae); also small gastropods, and some fruit. Occurs in pairs and small family groups; joins mixed-species parties, but at least equally likely to be found in small monospecific flocks. Unobtrusive and shy. Forages mostly very low down, but will move into middle and upper strata on occasion. Gleans food from leaves, stems and branches in dense vegetation tangles, particularly around edges of clearings, along rivers, and around treefalls and similar places. Flicks wings and tail while foraging.
Breeding. Nesting recorded in Mar–May in Uganda; juvenile seen in Jul in Gabon, where singing activity increases at beginning of rainy seasons and during short dry season, and breeding condition recorded in Dec; birds in breeding condition in Aug–Nov in Nigeria, Aug in Cameroon and DRCongo, May in Central African Republic and Feb in Angola. Territorial throughout year. Nest built in fork of branch or slung between two branches in low forest bush. Clutch 2 eggs; incubation by female only; no information on incubation and nestling periods.
Movements. Resident. Individuals ringed in Gabon retrapped at same site after 11 and 72 months.
Status and Conservation. Not globally threatened. Widespread, but distribution strangely patchy; assessed as common to abundant in some parts of its range, scarce and rare in others. Probably overlooked in some areas. Densities estimated at 10–12 pairs/km² in Gabon and 1 bird/10 ha in Nigeria. Known to occur in a number of national parks, such as those of Taï Forest, in Ivory Coast, Bia, in Ghana, Mbam-Djerem, in Cameroon, Minkébé, in Gabon, Nouabalé-Ndoki, in PRCongo, and Kibale Forest, in Uganda; occurs also in Okapi Faunal Reserve, in DRCongo.
Bibliography. Bannerman (1936, 1953), Barlow *et al.* (1997), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Forbes-Watson (1994), Gatter (1997), Germain & Cornet (1994), Grimes (1987), Hall & Moreau (1970), Jackson & Sclater (1938), Johnson, D.N. (1989), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Morel & Morel (1990), Nikolaus (1987), Rand *et al.* (1959), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Smith *et al.* (1996), Stevenson & Fanshawe (2002), Thiollay (1985).

83. Yellow-streaked Greenbul

Phyllastrephus flavostriatus

French: Bulbul à stries jaunes **German**: Gelbstreifenbülbül **Spanish**: Bulbul Listado
Other common names: Yellow-streaked Bulbul, Yellow-striped Greenbul; Sharpe's/Malawi Greenbul (*alfredi*)

Taxonomy. *Andropadus flavostriatus* Sharpe, 1876, Macamac, Gauteng, South Africa.
Forms a superspecies with *P. poliocephalus*; has been considered conspecific by some authors, but is much smaller, differs significantly in plumage characters and has distinctive song. Has been suggested that brown-headed race *alfredi* merits treatment as full species, but no significant vocal differences from other races. Several poorly differentiated races merged: thus, *itombwensis* (E DRCongo) and *ruwenzori* (W Uganda) treated as synonyms of *olivaceogriseus*, and *dendrophilus* (E Zimbabwe), *distans* (E Eastern Cape, in South Africa) and *dryobates* (Mt Gorongosa, in Mozambique) synonymized with nominate. Eight subspecies recognized.
Subspecies and Distribution.
P. f. olivaceogriseus Reichenow, 1908 – R DRCongo (Ruwenzori Mts, Itombwe and Mt Kabobo), W & SW Uganda, W Rwanda and N Burundi.
P. f. graueri Neumann, 1908 – highlands W of L Albert, L Edward and L Kivu, in E DRCongo.
P. f. kungwensis Moreau, 1941 – Kungwe-Mahari Mts, in W Tanzania.
P. f. tenuirostris (Fischer & Reichenow, 1884) – SE Kenya and E Tanzania S to E Mozambique lowlands (N of R Zambezi).
P. f. uzungwensis Jensen & Stuart, 1982 – E escarpment of Udzungwa Mts, in Tanzania.
P. f. alfredi (Shelley, 1903) – SW Tanzania, NE Zambia and N Malawi.
P. f. vincenti C. H. B. Grant & Mackworth-Praed, 1940 – SE Malawi (E of R Shire) and adjacent N Mozambique.
P. f. flavostriatus (Sharpe, 1876) – S Mozambique lowlands (S of R Zambezi), E Zimbabwe, NE & E South Africa and NW Swaziland.



Descriptive notes. 18–20 cm; male 31–40 g, female 26–30 g, male 32–42 g and female 23–34 g (*olivaceogriseus*). Nominate race has top and side of head and neck brownish-grey, lores slightly paler, ill-defined blackish line immediately before eye and extending behind it, conspicuous, fairly wide whitish broken eyering, some indistinct paler and darker streaking on ear-coverts; upperparts, including wings and tail, olive-brown; throat white; underparts whitish, grey-brown wash on breast and flanks, lightly streaked pale yellow from lower breast to undertail-coverts; iris grey to blue-grey, bill black or dark brown, paler base of lower mandible, yellow cutting edges; legs light grey or lead-grey. Sexes alike, female on average smaller than male. Juvenile has breast tinged dusky olive, centre of belly pale yellow. Race *olivaceogriseus* has head and neck grey, is more olive-green above, wings bright greenish, underparts washed grey, amount of yellow on belly as nominate; *graueri* is greener on back, with rump and uppertail-coverts gingerish, wing-coverts and edges of flight-feathers greenish-rufous, underparts less grey, yellow streaking extending to breast and upper belly, lower belly wholly yellow; *kungwensis* resembles previous, but crown somewhat darker grey, belly and undertail-coverts paler yellow; *tenuirostris* differs from last in having wings brownish-olive, underparts pale yellow, flanks olive-green, undertail-coverts brownish-yellow; *vincenti* is duller below than previous, throat more dirty white, underparts more grey, yellow streaking narrow and dull; *uzungwensis* has belly wholly and conspicuously yellow; *alfredi* is distinctive, top of head and neck brown (not grey), upperparts olive-tinged brown, uppertail-coverts dark rust, tail reddish-brown with greenish edging, wing-coverts and edges of secondaries and inner primaries rufous-brown, underparts whitish, breast side brown, undertail-coverts light brown. Voice. Song in E Africa a series of loud, distinct, descending notes, somewhat increasing in tempo towards end, "tchwik tchwerk tchk tchee tchow tchow tchichick -tcherk tchikikik", or 4–5 whistled downslurred notes followed by 3–4 faster ones on same pitch, "chip cher cher choy chewy tu-tu-tu"; in S part of range, often a longer series of initial downslurred notes with no faster ones at end; song usually preceded by variety of trills and call notes. Contact call a nasal, twangy "tyer-tyer" or "chow".
Habitat. Lowland, mid-altitude and, especially, montane forest, riverine forest, thick bush, small forest patches, sometimes bamboo. Occurs from sea-level to 3000 m; in Eastern Arc mountains of Tanzania, most common at 1100–1500 m.
Food and Feeding. Arthropods, including grasshoppers (Orthoptera), beetles (Coleoptera), bugs (Hemiptera), caterpillars, spiders (Araneae); also small gastropods, and some fruit. Occurs typically in groups of 5–6 individuals, occasionally in pairs or alone; a frequent and conspicuous member of mixed-species parties, but may also occur in monospecific flocks. Forages at all levels, usually above 4 m in middle and upper strata, but also in undergrowth down to 1–2 m. Noisy and conspicuous. Gleans from leaves and bark, peers into holes, climbs up vertical lianes; often favours epiphyte-clad branches, which it works over methodically, probing into moss, ferns, bundles of dead leaves, bark crevices, etc. On horizontal branches, often peers alternately over one side and then the other as it works along, sometimes hanging off sideways or upside-down to reach prey. Often progresses by working steadily upwards from low within a tree, sometimes switching trees, but on reaching canopy flies to base of nearby tree and repeats process. Has distinctive habit of deliberately but rapidly raising and lowering one wing at a time (exposing yellow underwing-coverts), both when foraging, as when peering beneath a branch, and in agitation; also pumps tail slowly upwards and quickly down.
Breeding. Nesting recorded in Feb–Oct and juveniles in Jan in DRCongo; in Jul and Nov, and nest-building in Jan, in Uganda; in Aug and Oct–Jan (birds on coast in breeding condition Jan–Jun, Oct–Nov) in Tanzania; Aug–Jan in Zambia and Sept–Jan in Malawi; Sept and Nov (in breeding condition Jul, and nest-building in Jan) in Mozambique; Oct–Jan (peak Nov–Dec) in Zimbabwe and Oct–Mar in South Africa. Monogamous. Solitary nester, territorial. Nest a flimsy cup of dark rootlets, twigs, tendrils, dried leaves, bark fragments, hyphae of *Marasmius* fungus, bound together with cobwebs, lined with fine grass inflorescences and rootlets (e.g. of epiphytic fern *Microsorum*) or unlined, outside decorated with moss, underside usually encased and concealed by 2–3 large dead leaves; shape often asymmetrical (longer axis parallel with supporting twigs), external diameter 6–12 cm, depth 5–8 cm, internal diameter 4·5–6·5 cm, depth 2·5–4·5 cm; built 1–2 m above ground in dense vegetation, e.g. among fern fronds or in bunch of dead leaves or

creepers, or hung from horizontal fork of small branch such that rim does not extend above supporting stems. Clutch 2 eggs, sometimes 3; incubation by female only; no information on incubation and nestling periods. Estimated mean annual mortality rates in Malawi 35% for males, 60% for females.
Movements. Largely sedentary; 14 ringed individuals in Malawi retrapped only 20–380 m from site of ringing. Some evidence of altitudinal movement in Malawi; also some wandering, as individuals occasionally appear at isolated forest patches 10 km from nearest regular habitat; one estimated to have travelled at least 32 km across woodland.
Status and Conservation. Not globally threatened. Race *alfredi*, sometimes treated as a separate species, is a restricted-range taxon: present in Tanzania-Malawi Mountains EBA. Common to locally abundant. No recent records from SE Kenya (race *tenuirostris*). Estimated density in N Malawi 3–4 pairs/10 ha; in Tanzania, 105 individuals/100 ha in Udzungwa Mts, and maximum density of c. 70 individuals/km² reported in another study in Eastern Arc mountains. Occurs in a number of national parks, including those of Ruwenzori, in Uganda, Volcans, in Rwanda, Virunga, in DRCongo, Udzungwa, in Tanzania, and Nyika, in Malawi; present also in numerous forest reserves and other protected areas.
Bibliography. Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brown & Britton (1980), Chapin (1953), Clancey (1964, 1996), Dinesen (1997), Dowsett (1990), Dowsett & Dowsett-Lemaire (1980, 1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1983, 1989), Dowsett-Lemaire & Dowsett (2004), Ginn *et al.* (1989), Hall & Moreau (1970), Harrison *et al.* (1997), Irwin (1981), Jackson & Sclater (1938), Jensen & Brøgger-Jensen (1992), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louw (2005c), Mackworth-Praed & Grant (1960, 1963, 1973), Maclean (1993), Mlingwa (1996a), Moyer (1993), Romdal (2001), Sclater & Moreau (1932), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Tarboton (2001), Turner & Zimmerman (1979), Vernon *et al.* (1990), Zimmerman *et al.* (1996).

84. Grey-headed Greenbul

Phyllastrephus poliocephalus

French: Bulbul à ventre jaune **German**: Goldbauchbülbül **Spanish**: Bulbul Ventriamarillo
Other common names: Yellow-bellied Greenbul

Taxonomy. *Xenocichla poliocephala* Reichenow, 1892, Buea, 1200 m, Mount Cameroon, Cameroon.
Forms a superspecies with *P. flavostriatus*; has been considered conspecific by some authors, but is much larger, differs significantly in plumage characters, and lacks the distinctive song of that species. Monotypic.
Distribution. Extreme SE Nigeria (Obudu Plateau) and W Cameroon (Banyang Mbo and Mt Manengouba S to Mt Cameroon).



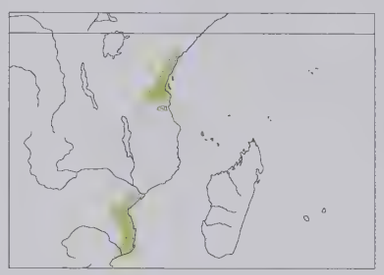
Descriptive notes. 20–23 cm; male c. 54·5–65 g, female c. 37·8 g. Large, distinctive montane greenbul. Top of head and neck are grey, side of face grey, indistinct pale loral line, narrow inconspicuous white eyering; mantle grey-green, becoming green on back and scapulars, brighter green on rump and upper-tail-coverts; upperwing-coverts olive-brown, flight-feathers yellow-olive; tail olive-brown, edged green, with narrow yellow tips of all except central feather pair; throat white, underparts, including undertail-coverts, bright yellow; iris dark brown, grey-brown or grey; upper mandible grey or blackish, lower mandible paler, yellowish, pale horn cutting edges and tip; legs grey. Sexes alike, female on average considerably smaller than male. Juvenile undescribed. Voice. Calls include loud, sharp, repeated "churp" or "tyow", often repeated, and fast "churp-p-p" or "chrititit", sometimes combined as "ti-ti-ti-ti-tyow"; similar to calls of *P. flavostriatus*.
Habitat. Mature mid-altitude forest between 500 m and 1800 m, rarely to 2000 m; on Mt Kupé (Cameroon) most numerous at 1200–1800 m. Less frequent in secondary forest.
Food and Feeding. Insectivorous. Usually occurs in small, noisy, boisterous, mobile groups, more rarely singly; frequent and conspicuous member of mixed-species parties. Forages mainly in middle strata and canopy, but periodically descending to 3–4 m. Gleans from mossy trunks, epiphytes, lianes, loose bark, etc.; hops rapidly along horizontal moss-clad, branches, peering first over one side and then over the other, pausing periodically to probe. Pumps tail and flicks wings frequently.
Breeding. In Cameroon, nest with young (Mt Kupé, at 2000 m) in Apr, dependent juvenile in Mar and immatures Jan–Feb, and birds in breeding condition in Nov and Jan–Mar. No other information.
Movements. No information.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Cameroon Mountains EBA. Common in suitable habitat within its small range. Earlier reports of its occurrence in the Bamenda Highlands (Cameroon) are incorrect. Potential threats include unsustainable exploitation of timber, uncontrolled burning, and clearance of habitat for agriculture. Occurs in the Banyang-Mbo Wildlife Sanctuary and Rumpi Hills Forest Reserve, both in Cameroon. The other Cameroon localities where it is known to be present, Mt Manengouba, Mt Nlonako, Bakossi Mountains, Mt Kupé and Mt Cameroon, are not formally protected in any way, nor is the Obudu Plateau, the species' single Nigerian site.
Bibliography. Bannerman (1936, 1953), Borrow & Demey (2001), Bowden (2001), Butchart & Stattersfield (2004), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1998b, 1999, 2000), Eisentraut (1963, 1973), Elgood *et al.* (1994), Fishpool & Evans (2001), Hall & Moreau (1970), Keith *et al.* (1992), Louette (1981), Mackworth-Praed & Grant (1973), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stuart (1986).

85. Tiny Greenbul

Phyllastrephus debilis

French: Bulbul minute **German**: Schlankbülbül **Spanish**: Bulbul Chico
Other common names: Slender Bulbul, Smaller Yellow-throated/Miniature Greenbul; Usambara/Green-headed Greenbul (*albigula*)

Taxonomy. *Xenocichla debilis* W. L. Sclater, 1899, north of Inhambane, south Mozambique.
No close relatives; conspicuously smaller than any of its congeners. Race *albigula* considered by some to be possibly an incipient species, but intergrades with other races reported. Three subspecies recognized.
Subspecies and Distribution.
P. d. rabai Hartert & van Someren, 1921 – C & S coastal Kenya and NE coastal Tanzania (S to R Rufiji).
P. d. albigula (Grote, 1919) – Usambara Mts, Nguru Mts and Nguu Mts, in E Tanzania.
P. d. debilis (W. L. Sclater, 1899) – SE Tanzania, S Mozambique and extreme E Zimbabwe (Haroni-Rusitu).



Descriptive notes. 13–14 cm; male 13·5–17 g, female 12·5–15 g. Smallest African bulbul and smallest member of genus, differs from others in lacking nail on upper mandible; sharply defined grey head and pale eyes. Nominate race has top of head and neck grey, lightly washed olive; lores and ear-coverts grey, slightly paler than crown, some indistinct paler streaking; upperparts dull olive-green, tail slightly browner but not contrasting, wings olive-green; throat white, breast and belly pale grey-white, washed greyer on flanks and across breast, some pale yellow streaking; lower belly and undertail-coverts light yellow-olive; iris white or creamy to pale yellow or golden; bill grey or blue-grey, paler lower mandible and cutting edges; legs black or grey. Sexes alike, female on average smaller than male. Juvenile has top of head greener, similar to back. Race *albigula* differs from nominate in having strong olive-green wash on crown and nape, upperparts darker, throat greyish, underparts darker and greyer with little yellow, upper mandible blackish, eye yellow or yellowish-orange; *rabai* has head and neck grey without greenish tones, upperparts bright olive-green, resembles nominate below but yellow tones brighter, belly yellowish-white, undertail-coverts pale greenish-yellow, bill variable, sometimes greyish-horn or brownish, eye sometimes red-brown or dark grey-brown (possibly age-related). Voice. Alarm or contact call of race *albigula* a gurgling "chrrrrrr", of *rabai* a rasping "chicidididididi", rising in pitch, also low "churr" and nasal "nnyeh nnyeh"; *albigula* has soft but explosive "tut" as contact when foraging in group. Song a series of short "chit" or "tut" notes mixed with lower, more nasal "nya" or "dya" sounds, e.g. "chitchitchit, chit-nya-nya-nya".
Habitat. Lowland evergreen forest, forest–woodland mosaic, thick coastal scrub, gallery forest; sometimes woodland, including miombo. Appears to tolerate disturbed forest in parts of range, but recorded only in intact forest in others. Sea-level to 1550 m; race *albigula* above 300 m in E Tanzania mountains.
Food and Feeding. Insectivorous. Usually seen in pairs or in small parties, sometimes singly; often joins mixed-species parties. Forages mostly in lower and middle strata (mostly below 4 m), but does sometimes ascend to canopy; generally keeps to dense undergrowth and lianes, and prefers thin branches and creepers; group-members constantly call to each other. Gleans insects from leaves with agility, reminiscent more of a warbler (Sylviidae) than of a bulbul; flicks wings.
Breeding. Nesting recorded in Dec and May; birds in breeding condition in Oct–May in coastal Tanzania and Oct–Jan in Zimbabwe. Monogamous. Solitary nester, territorial. Nest a small neat cup of dark fibres, tendrils, black hyphae of *Marasmius* fungus, ferns, lichens and dry leaves, bound together with cobwebs, lined with fine plant stems; often asymmetrical (longer axis parallel with supporting twigs), external diameter 6–7 cm, depth 4–6 cm, internal diameter 3·5–5 cm, cup depth 2·2 cm; usually c. 1 m (range 0·4–5 m) above ground in horizontal fork of small tree, or where two or more horizontal twigs cross, often where a few large dead leaves trapped and which serve to conceal nest. Clutch 2 eggs; no information on incubation and nestling periods.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Generally common; apparent declines in N & S parts of range, implying that it is less common than it used to be in parts of Kenya and S Mozambique. Occurs in a number of protected areas, including Arabuko-Sokoke and Shimba Hills Forest Reserves, in Kenya, East and West Usambara Forest Reserves (and numerous coastal forest reserves) and the Selous Game Reserve, in Tanzania, and Gorongosa National Park, in Mozambique.
Bibliography. Britton (1972, 1980), Brown & Britton (1980), Caldwell-Barr (2002), Clancey (1996), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Ginn *et al.* (1989), Hall & Moreau (1970), Harrison *et al.* (1997), Irwin (1981, 2004), Jackson & Sclater (1938), Karr (1976), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960, 1963), Maclean (1993), Mlingwa (1993), Parker (1999), Romdal (2001), Sclater & Moreau (1932), Seddon *et al.* (1995), Stevenson & Fanshawe (2002), Tarboton (2001), Turner & Zimmerman (1979), Vernon & Dean (2005a), Vernon *et al.* (1990), Zimmerman *et al.* (1996).



Genus *BLEDA* Bonaparte, 1857

86. **Red-tailed Bristlebill**

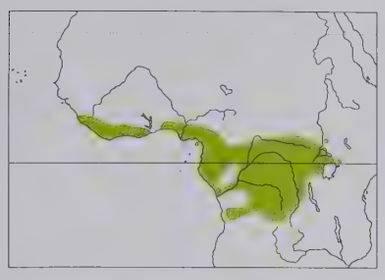
Bleda syndactylus

French: Bulbul moustac **German**: Rotschwanzbleda **Spanish**: Bulbul Bigotudo
Other common names: (Common) Bristlebill

Taxonomy. *Dasycephala syndactyla* Swainson, 1837, Sierra Leone.
Proposal that present species forms a species pair with *B. eximius* undermined by recent molecular evidence, which suggests that it is sister-taxon to the rest of genus. Moreover, these data do not support the traditional subspecific treatment as listed below, but indicate a more complex situation; pending further study, however, it is considered better to adopt an orthodox approach. Racial affiliation of birds in Angola uncertain, provisionally included in *woosnami*. Otherwise, race *nandensis* (described from N Nandi Forest, in W Kenya), is only very slightly more yellow below than *woosnami*, and regarded as a synonym of latter; *multicolor* (SE Nigeria E to W DRCongo) is not satisfactorily distinguishable from nominate. Species name sometimes given as *syndactyla*, but genus is masculine. Two subspecies recognized.

Subspecies and Distribution.
B. s. syndactylus (Swainson, 1837) – Sierra Leone E to W DRCongo (Bangui, Lukolela, Tshuapa).
B. s. woosnami Ogilvie-Grant, 1907 – E DRCongo (Kasai, Lualaba, Upper Congo), S Sudan, Uganda, W Kenya, N Angola and extreme NW Zambia.

Descriptive notes. 20·5–23 cm; male 36–57 g, female 35–49·5 g. Striking, robust bulbul with strong bill, well-developed rictal bristles. Nominate has side of face olive-green, darker stripe running from base of bill down side of throat, sweeping up onto lower rear edge of ear-coverts; lores dirty olive-yellow, half-moon of bare blue-grey skin above eye (equally wide in front and



behind eye); rest of head, and upperparts, olive-green to olive-brown, bright rufous uppertail-coverts and tail contrasting with back; bright yellow below, slightly paler on undertail-coverts, washed olivaceous on breast and flanks; iris red, red-brown or chestnut-brown; bill blue-black or dark brown above, paler grey or bluish below; legs pale blue-grey, red-brown or greyish-pink. Distinguished from other members of genus by tail colour, also voice. Sexes alike, female on average smaller than male. Juvenile is largely russet above and on flanks, with yellow orbital skin, yellow cutting edges of bill and gape, dull yellowish legs. Race *woosnami* is more intensely yellow below than nominate. Voice. Song in W of range a series of melancholy, vibrant syllables on same pitch, ending with "turrrruuuu-turrrruuuu-turrruuuu"; in E a series of 4–5 quavering, descending notes, "kweee-kweee-kweee-kweee". Calls include nasal "kyow" or "pyeeuw" and hard "chup". Less vocal than *B. canicapillus* and *B. eximius*.

Habitat. Lowland evergreen and semi-deciduous forest, gallery forest, dense thicket and forest–savanna mosaic, and old secondary forest; mainly in lowlands, but recorded to 2150 m in E Africa and 1450 m in Liberia.

Food and Feeding. Arthropods, including orthopterans, beetles (Coleoptera), mantids, termites (Isoptera), cockroaches (Blattodae), cicadas (Cicadidae), centipedes (Chilopoda), millipedes (Diplopoda) and spiders (Araneae); also frogs and toads, and some fruit. Found in pairs or small family groups; frequently found in mixed-species parties, and regularly attracted by *Dorylus* ant swarms. Large size and heavy bill enable it to take relatively large prey and to dominate in many interspecific encounters, e.g. around ant columns. Shy and retiring. Forages at or near ground level, rarely above 3–5 m, and keeps largely to undergrowth. Feeds from low vegetation, trunks and fallen wood, and at ground level, turning over leaves and other debris; also makes short aerial sallies. Uses horizontal to vertical perches. Extent of territoriality unclear; more than one pair or family group can be found around ant swarms, where a dominance hierarchy is apparently established, dominance at any one time determined by the pair the home range of which is occupied by the ants; ringed individuals did not follow ants for more than 200 m. Where or when ant swarms are few, may be more strictly territorial.

Breeding. Birds in breeding condition in Mar–Apr, Aug–Sept and Nov and fledgling in Oct in Liberia; dependent juvenile in Jan in Ivory Coast; laying Oct–Dec (breeding condition also Mar, Jul–Aug) in Cameroon, Oct–Mar (peak Jan–Feb) in Gabon, Sept–Oct (breeding condition also Jul) in DRCongo, and Jan, Mar, Jun, Aug and Oct in Sudan; breeding condition Sept–Oct and juveniles Jan–Feb in Angola; nesting recorded Apr–May and Aug, in breeding condition Jan–Feb and Jun and fledgling in Dec in Uganda. Monogamous. Territorial. Nest c. 10 cm in diameter and 5 cm deep, resembles bundle of dead leaves, internal cup shallow or more funnel-shaped, outer layer built from supple twigs and cobwebs, inner layer of large dead leaves, lined with slender twigs, fibres and tendrils, bottom in particular lined with hyphae of *Marasmius* fungus (helps to bind structure together); placed 1–3·5 m above ground in dense foliage of low understorey bush. Clutch 2 eggs, rarely 1; incubation by female; no information on incubation and nestling periods. Of 14 nests in Gabon, 11 were destroyed, one young fledged from each of the three surviving nests.

Movements. Resident. Marked site-fidelity recorded in Gabon: 16 of 20 ringed individuals retrapped at same site at least once over a 6-month period following ringing.

Status and Conservation. Not globally threatened. Variously rare, uncommon or common within its large range. Probably under-recorded in at least some areas as a result of its secretive behaviour and the fact that it is not particularly vocal (compared with *B. canicapillus* and *B. notatus*). Estimated densities of 15–18 pairs/km² in Gabon. Occurs in numerous protected areas, such as Sapo National Park, in Liberia, Taï Forest National Park, in Ivory Coast, Kakum National Park, in Ghana, Korup National Park, in Cameroon, Nouabalé-Ndoki National Park, in PRCongo, Salonga National Park, in DRCongo, and Semliki National Park, in Uganda.

Bibliography. Bannerman (1936, 1953), Bennun (1994), Benson *et al.* (1971), Beresford (2002), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975), Chappuis & Érard (1993), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), David & Gosselin (2002b), Dean (2000), Demey & Fishpool (1994), Dickinson, E.C. (2003), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Mann (1985), Nikolaus (1987, 1989), Prigogine (1971), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985), Turner & Zimmerman (1979), Waltert & Mühlenberg (1999), Willis (1983), Zimmerman (1972), Zimmerman *et al.* (1996).

87. Green-tailed Bristlebill

Bleda eximius

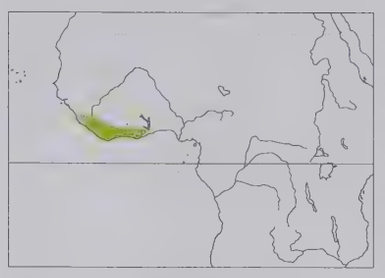
French: Bulbul à queue verte **German**: Grünschwanzbleda **Spanish**: Bulbul Coliverde

Taxonomy. *Trichophorus eximius* Hartlaub, 1855, Dabocrom, Ghana.

Suggestion that this forms a species pair with *B. syndactylus* undermined by recent molecular evidence. Was previously treated as conspecific with *B. notatus*, but recent acoustic and morphological studies indicate that the two are separate species; taxonomic confusion resulted in uncertainty over which of the two was involved in published observations in some of the earlier literature. Species name sometimes given as *eximia*, but genus is masculine. Monotypic.

Distribution. Sierra Leone E to SW Ghana.

Descriptive notes. 21·5–23 cm; male 46–52·5 g, female 42–46·5 g. Stocky, handsome bulbul, with strong bill, well-developed rictal bristles. Side of face is olive-green, darker stripe from base of bill down side of throat, sweeping up onto lower rear edge of ear-coverts; lores dull olive-yellow, half-moon of blue-grey skin above eye (widest behind eye), small feathered yellowish postocular spot; uniform olive-green above, including tail, except for narrow yellow tips of outer three pairs of rectrices, extent of yellow greatest (c. 10 mm) on outer pair and decreasing inwards; bright rich yellow below, except for olive wash on breast side and flanks; iris chestnut-brown; bill dark blue-grey, paler or bluish below; legs whitish-flesh, tinged blue. Distinguished from *B. syndactylus* by



yellow-tipped green tail, and from *B. canicapillus* by green head and neck, bare skin around eye, yellowish lores, narrower yellow tail tips, from both also by voice. Sexes alike, female on average smaller than male. Juvenile undescribed. Voice. Song a series of pure, vibrant whistled notes, "hee-huu-huu-hu-heeu", rather similar in tone to those of *B. syndactylus*. Calls include abrupt, nasal "kyop", sometimes followed by fast "kiuwkiuwkiuwkiuwkiu".

Habitat. Lowland evergreen and semi-deciduous forest and older secondary forest; rarely to 1450 m in Liberia.

Food and Feeding. Arthropods, including beetles (Coleoptera), ants (Hymenoptera), caterpillars, spiders (Araneae) and millipedes (Diplopoda); also small frogs. Singly or in pairs; often joins mixed-species parties, and regularly attends *Dorylus* ant swarms. Very shy and unobtrusive; forages at or near ground level, rarely above 3 m.

Breeding. In Liberia, fledgling observed in Oct, peak vocal activity Aug–Oct and birds in breeding condition in Jun–Aug, Oct and Dec; in breeding condition in Sept in Ivory Coast. No other information.

Movements. Resident.

Status and Conservation. VULNERABLE. Restricted-range species: present in Upper Guinea Forests EBA. Generally rare throughout its range; locally common in Liberia. The least common bristlebill within the region; certainly the least vocal, which probably results in its being under-recorded; most often detected through use of mist-nets. Forest habitat in region is subject to logging and to consequent settlement and smallholder agriculture. Occurs in several protected areas, including Western Area Peninsula Non-hunting Forest Reserve, in Sierra Leone, Sapo National Park, in Liberia, Nimba Nature Reserve, in Guinea, Taï Forest National Park, in Ivory Coast, and Kakum National Park, in Ghana.

Bibliography. Bannerman (1936, 1953), Beresford (2002), Borrow & Demey (2001), Britton (1972), Butchart & Stattersfield (2004), Chappuis & Érard (1993), Collar *et al.* (1994), Colston & Curry-Lindahl (1986), David & Gosselin (2002b), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Gartshore *et al.* (1995), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Karr (1976), Keith *et al.* (1992), Mackworth-Praed & Grant (1973), Rainey & Lachenaud (2002), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Thiollay (1985), Waltert *et al.* (1999), Willis (1983).

88. Lesser Bristlebill

Bleda notatus

French: Bulbul jaunelore **German**: Kleiner Grünschwanzbleda **Spanish**: Bulbul Manchado

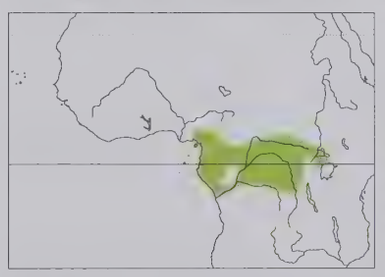
Taxonomy. *Trichophorus notatus* Cassin, 1856, Moonda River, Gabon.

Until recently treated as a race of *B. eximius*, but acoustic and morphological data indicate that it is a separate species; taxonomic confusion resulted in uncertainty over which of the two was involved in published observations in some of the earlier literature. As a consequence of these findings, considered to form a superspecies with *B. canicapillus*. Molecular evidence from more recent work supports these treatments. It further suggests that race *ugandae* may also merit species rank, a view reinforced by some morphological and (less convincingly) acoustic data; additional study required. Species name sometimes given as *notata*, but genus is masculine. Two subspecies recognized.

Subspecies and Distribution.

B. n. notatus (Cassin, 1856) – extreme SE Nigeria and Bioko I E to SW Central African Republic, S to lower R Congo.

B. n. ugandae van Someren, 1915 – SE Central African Republic, DRCongo (except lower reaches of R Congo), extreme SW Sudan and Uganda.



Descriptive notes. 19·5–21 cm; 28·5–40·7 g (nominate), male 37–48 g, female 33–39 g (*ugandae*). Stocky, handsome bulbul, with fairly strong bill, well-developed rictal bristles. Nominate race has lores and preorbital area yellow, ill-defined postorbital area grey or yellowish-grey, narrow grey feathered eyering, dark olive-green cheeks and ear-coverts; small patch of yellow feathering at base of lower mandible, abruptly becoming almost blackish and forming indistinct blackish moustachial stripe extending from near gape, sweeping up onto lower rear edge of ear-coverts; rest of head and entire upperparts olive-green; tail olive-green, outer four (sometimes three) pairs of rectrices with broad yellow tips, depth of yellow greatest on outermost (c. 20–23 mm), decreasing inwards (10 mm on T3, restricted to outer web); rich, bright yellow below, dark olive-green wash on flanks and side of breast (sometimes extending fully across breast); iris brown, dark brown or red-brown; bill blackish above, blue-grey below; legs grey, blue-grey or pinkish-grey. Distinguished from *B. canicapillus* by green (not grey head), yellow (not grey) loral spot. Sexes alike, female on average smaller than male. Juvenile is mostly dark rufous, base and cutting edges of bill yellow, legs yellowish, iris dull brown. Race *ugandae* is larger than nominate (male wing on average c. 10 mm longer), has bright yellow eyes, duller dirty olive-yellow lores, and in at least some populations broader yellow tips of outer tail feathers (c. 22–30 mm on outermost, decreasing to c. 12–15 mm on T3). Voice. Song of nominate race tremulous and descending in pitch, somewhat reminiscent of that of *B. syndactylus* but lacking latter's melancholy quality; calls include hard, repeated "chup" and "chiup", sometimes followed by "trrrrrrrtttt" rattle, and "whew", in combination may become "chup chup whéé chuw chuw". Song of *ugandae* less well known, but includes sharp "chup-chup-chup" notes followed by clear rolling series of cheerful "whéé-oo-whéo-o-whéé-oo" notes on descending scale, reminiscent of *B. canicapillus*; also includes lively phrases such as "chup-chwe-chwe-we-we-chóówe-chóówe".

Habitat. Lowland evergreen and semi-deciduous forest, swamp-forest, forest–savanna mosaic and secondary forest; mainly in lowlands, to 1250 m in Uganda.

Food and Feeding. Arthropods, including orthopterans, beetles (Coleoptera), butterflies (Lepidoptera), caterpillars, ants (Hymenoptera), spiders (Araneae); also small frogs, and some fruit. Mainly

On following pages: 89. Grey-headed Bristlebill (*Bleda canicapillus*); 90. Western Bearded Greenbul (*Criniger barbatus*); 91. Eastern Bearded Greenbul (*Criniger chloronotus*); 92. Red-tailed Greenbul (*Criniger calurus*); 93. Yellow-bearded Greenbul (*Criniger olivaceus*); 94. White-bearded Greenbul (*Criniger ndussumensis*).

in small family groups, typically of a pair and one young; often joins mixed-species flocks. Generally skulking and secretive, but vocal. Forages mostly at or near ground level, usually below 3 m. Prefers mostly horizontal perches. Takes food mostly from the ground, in short sallies or by hopping; also from tree trunks and low vegetation. Pecks at ground prey and tosses leaves. Regularly attends *Dorylus* ant swarms; more than one pair or group may be attracted to large columns; in studies, ringed individuals were replaced by unringed ones once the column had moved 200 m. Spreads tail to show yellow corners in interactions.

Breeding. Breeds in all months in DRCongo, probably also in Cameroon; in most months, peak in Jan–Feb short dry season (only long dry season of Jun–Sept avoided) in Gabon. Monogamous. Estimated territory size in PRCongo 2 ha under closed canopy; pairs in Gabon live in overlapping home ranges, do not defend territories. Nest built by both sexes, a simple bundle of dried leaves held together and attached to supporting branch with living strands of *Marasmius* fungus, lined with skeletonized leaves and more *Marasmius*, generally hidden in larger bundle of dead leaves 0·5–3 m above ground in shrub in open forest. Clutch 2 eggs, rarely 1; incubation by female only, period 14 days; young brooded and fed by both parents, nestling period 13–14 days; usually only one chick fledges, remains with parents for at least 8–9 months. In Gabon, 82% of nests were destroyed, of 15 successful nests average 1·3 young raised per nest.

Movements. Resident; striking site-fidelity in Gabon, where 76% of ringed individuals recaptured at ringing site and none caught more than a few hundred metres distant. Young apparently do not disperse far; two adults recaptured at site where reared one year earlier.

Status and Conservation. Not globally threatened. Generally widespread and common across its range. Density in Gabon estimated at 1·2 birds/ha. Adapts to secondary habitats. Occurs in a number of protected areas, such as Korup National Park, in Cameroon, Nouabalé-Ndoki National Park, in PRCongo, Salonga National Park, in DRCongo, and Semliki National Park, in Uganda.

Bibliography. Bannerman (1936, 1953), Beresford (2002), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a, 1971b, 1981c), Brosset & Érard (1986), Carswell (1986), Cave & MacDonald (1955), Chapin (1953), Chappuis (1975), Chappuis & Érard (1993), Christy & Clarke (1994), David & Gosselin (2002b), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Hall & Moreau (1970), Jackson & Sclater (1938), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Nikolaus (1987, 1989), Pérez del Val (1996), Prigogine (1971), Rand *et al.* (1959), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Willis (1983).

89. **Grey-headed Bristlebill**

Bleda canicapillus

French: Bulbul fourmilier **German**: Graukopfbleda **Spanish**: Bulbul Hormiguero

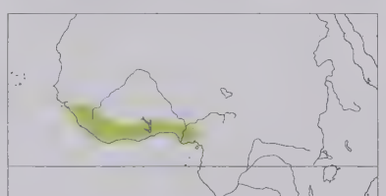
Taxonomy. *Trichophorus canicapillus* Hartlaub, 1854, Sierra Leone.

Recently shown by acoustic and morphological studies to form a superspecies with *B. notatus*, a relationship hitherto unrecognized; the two appear to meet in SE Nigeria (Cross River National Park region) and SW Cameroon (Takamanda Forest Reserve). Species name sometimes given as *canicapilla*, but genus is masculine, and in any case this species name is invariable. Two subspecies recognized.

Subspecies and Distribution.

B. c. morelorum Érard, 1992 – W Gambia and SW Senegal.

B. c. canicapillus (Hartlaub, 1854) – Guinea-Bissau E to SE Nigeria (also isolated population on Jos Plateau) and extreme SW Cameroon (Takamanda).



Descriptive notes. 20·5–22 cm; male 39·5–46·5 g, female 36–40·5 g. Stocky bulbul with fairly strong bill, well-developed rictal bristles. Nominate race has slate-grey head and neck, contrastingly paler grey lores and small postorbital area, narrow grey (non-contrasting) feathered eyering; small patch of whitish feathering at base of lower mandible, abruptly becoming almost blackish and forming indistinct moustachial stripe, sweeping up onto lower rear edge of ear-coverts; upperparts and tail olive-green, yellow tips on outer three pairs of rectrices, depth of yellow 12–15 mm, greatest on outermost pair; chin and throat pale yellowish, underparts brighter yellow, breast side and flanks washed olive-green; iris brown to reddish; bill blackish above, blue-grey below; legs pale blue-grey, sometimes tinged pinkish. Distinguished from *B. notatus* by grey (not green) head, grey (not yellow) loral spot; from *B. eximius* also by wider yellow tail tips, no bare skin around eye. Sexes alike, female on average smaller than male. Juvenile poorly known, has cutting edges and base of bill yellow, legs grey-pink. Race *morelorum* is paler yellow below than nominate, head also paler grey, upperparts browner, less green. Voice. Song far-carrying, with cheerful, ringing quality, typically consisting of loud initial note, brief pause, followed by a series of "chéépo" notes on descending scale. Other characteristic notes include loud "chéép" or "chríup" and "kyuw" or "peeuw", often repeated in long series.

Habitat. Lowland evergreen and semi-deciduous forest, gallery forest, forest–savanna mosaic, woodland thicket and secondary forest; to at least 1000 m.

Food and Feeding. Arthropods, including orthopterans, termites (Isoptera), ants (Hymenoptera), millipedes (Diplopoda), spiders (Araneae) and similar; small frogs and fruit also recorded as taken. Mainly in pairs or small family groups; often joins mixed-species flocks, and regularly attends *Dorylus* ant swarms. Generally skulking and shy, but usually vocal. Forages mostly at or near ground level, usually below 2 m, occasionally to 5 m. Prefers angled perches, from where makes sallies for insects to the ground, dead wood, tree trunks and low vegetation; also gleans from vegetation. Flicks wings and flicks tail up to horizontal (tail spots conspicuous).

Breeding. Birds in breeding condition in Jan in Senegal, Jun in Gambia, May, Aug–Sept and Dec in Sierra Leone, Jul–Aug (and nest-building observed in Nov) in Liberia, May–Jun in Ivory Coast and Jun in Nigeria. Only one nest described, an insubstantial, fibre-lined, open cup of dead leaves, on base of dry twigs, externally 11 cm in diameter and 9 cm deep, hanging 1·6 m above ground among trailing vines in low bush. Clutch 2 eggs; no information on incubation and nestling periods.

Movements. Largely sedentary; individual found in a building in Ghana may indicate some local movement.

Status and Conservation. Not globally threatened. Generally common; the commonest and most widespread bristlebill in W Africa. Liberian population estimated to be at least 120,000 pairs. Apparently adapting well to secondary habitats. Occurs in numerous protected areas, including Loma Mountains Non-hunting Forest Reserve, in Sierra Leone, Sapo National Park, in Liberia, Nimba Nature Reserve, in Guinea, Taï Forest National Park, in Ivory Coast, Bia National Park, in Ghana, and Okomu National Park, in Nigeria.

Bibliography. Bannerman (1936, 1953), Barlow *et al.* (1997), Beresford (2002), Borrow & Demey (2001), Britton (1972), Chappuis (1975), Chappuis & Érard (1993), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), David & Gosselin (2002b), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Érard (1992), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Gartshore *et al.* (1995), Gatter (1997), Gore (1990), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Johnson, D.N. (1989), Karr (1976), Keith *et al.* (1992), Languy & Motombe (2003), Languy *et al.* (2005), Mackworth-Praed & Grant (1973), Morel & Chappuis (1992), Morel & Morel (1990), Thiollay (1985), Waltert & Mühlenberg (1999), Willis (1983).

Genus *CRINIGER* Temminck, 1820

90. **Western Bearded Greenbul**

Criniger barbatus

French: Bulbul crinon **German**: Westlicher Haarbülbülm **Spanish**: Bulbul Barbado

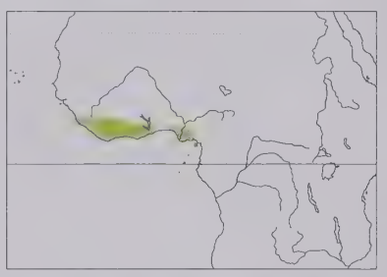
Taxonomy. *Trichophorus barbatus* Temminck, 1821, Sierra Leone.

Genus previously considered close to *Alophoixus*, and latter often merged with it; recent molecular evidence, however, strongly supports the view that the relationship between the two groups is remote, despite close similarity in appearance. Forms a superspecies with *C. chloronotus*, and often considered conspecific, but exhibits appreciable vocal as well as plumage differences. Race *ansorgeanus* is morphologically and geographically intermediate between nominate race and *C. chloronotus* and could arguably, on current knowledge, equally be placed with latter; better knowledge of its vocalizations would help to resolve its true taxonomic position. Two subspecies recognized.

Subspecies and Distribution.

C. b. barbatus (Temminck, 1821) – Sierra Leone and SE Guinea E to SW Togo and S Benin.

C. b. ansorgeanus Hartert, 1907 – S Nigeria.



Descriptive notes. c. 22 cm; male 41–48 g female 38–43 g. Large bulbul with heavy bill, conspicuous yellow throat feathers frequently puffed out, lax crown feathers raised in display; upperside appearing rather untidy, mottled grey-brown. Nominate race has grey lores, inconspicuous pale grey narrow feathered eyering, olive-brown ear-coverts with conspicuous whitish feather shafts; feathers of head grey centrally with green feather fringes, upperparts olive-green, with grey feather centres on mantle; tail slightly browner-tinged than back but not obviously contrasting; upperwing-coverts and flight-feathers olive-green, browner on inner webs of primaries and outer secondaries; conspicuous yellow throat, contrasting with rest of plumage; breast grey with green feather fringes and pale shaft streaks, belly, flanks and undertail-coverts olive-yellow with buffy tinge; iris dark brown; bill black, slightly paler lower mandible; legs dark grey to black. Distinguished from *C. olivaceus* by larger size, more mottled appearance, greyer underparts, no blue orbital ring. Sexes alike, female on average smaller than male. Juvenile is browner above than adult, plain brownish below, throat paler yellow, gape yellow. Race *ansorgeanus* is smaller on average than nominate, has throat much paler yellow (feather bases white), more yellow on belly, gingery undertail-coverts, rufous uppertail (contrasting with back), wider blue-grey eyering contrasting with more olive-green head, juvenile with rusty-brown secondary coverts and secondary tips, paler throat, yellower breast, cinnamon undertail-coverts, grey-brown iris, greyish-olive legs, olive-yellow lower mandible. Voice. Most common song a frequent, clear, far-carrying, disyllabic whistle, "teruu twéééur"; calls include loud "kyuw" and hard "tsik". Voice of race *ansorgeanus* less well known, but includes lively "chew-cheeuw-chéééúw-eer".

Habitat. Lowland evergreen and semi-deciduous forest, swamp-forest, gallery forest and larger forest patches in forest–savanna mosaic; found in older secondary growth, but not in younger regrowth. Recorded to 1250 m in Liberia.

Food and Feeding. Mainly insectivorous, but berries and seeds also regularly taken. Usually in small, noisy groups; often a conspicuous component of mixed-species parties, and frequently attends *Dorylus* ant swarms. Forages mainly in lower stratum, but not on the ground, up to 10 m, mainly below 5 m, and usually in relatively open areas. Favours sloping perches in shrubs and small trees. Gleans from leaves and makes short aerial sallies to take berries and other items. Frequently puffs out throat feathers, thought possibly to be a contact signal.

Breeding. Laying recorded in Jan in Nigeria; dependent fledglings in Jan and juveniles in Oct and Mar–Apr in Liberia; juveniles in Jul in Ghana; birds in breeding condition recorded in Dec–Apr. No other information.

Movements. No information; thought to be sedentary.

Status and Conservation. Not globally threatened. Not uncommon to common throughout most of range, wherever suitable habitat remains; rare in extreme SW Togo. Recently recorded for first time in S Benin. Occurs in a number of national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, and Bia and Kakum, in Ghana; also in other protected areas, such as Loma Mountains Non-hunting Forest Reserve, in Sierra Leone, and Omo Forest Reserve (part of which is a Strict Nature Reserve), in Nigeria.

Bibliography. van den Akker (2003), Bannerman (1936, 1953), Beresford (2002), Borrow & Demey (2001), Britton (1972), Chappuis (1975), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Gartshore *et al.* (1995), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Karr (1976), Keith *et al.* (1992), Louette (1981), Mackworth-Praed & Grant (1973), Marchant (1953), Pasquet *et al.* (2001), Serle (1957), Thiollay (1985), Waltert *et al.* (1999).

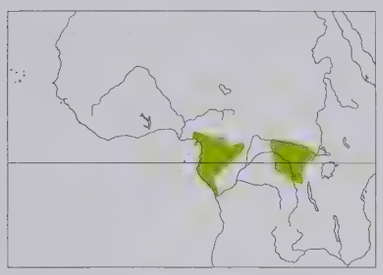
91. **Eastern Bearded Greenbul**

Criniger chloronotus

French: Bulbul à dos vert **German**: Östlicher Haarbülbül **Spanish**: Bulbul Dorsiverde

Other common names: Green-backed/Congo/White-throated Bulbul

Taxonomy. *Trichophorus chloronotus* Cassin, 1859, Camma River, Gabon.
Genus previously considered close to *Alophoixus*, and latter often merged with it; recent molecular evidence, however, strongly supports the view that the relationship between the two groups is remote, despite close similarity in appearance. Forms a superspecies with *C. barbatus*, and often considered conspecific, but exhibits appreciable vocal and plumage differences. Race *ansorgeanus* of latter is morphologically and geographically intermediate between nominate race of that species and present species and could arguably, on current knowledge, equally be placed with this species; better knowledge of its vocalizations would help to resolve its true taxonomic position. Proposed race *weileri* (from Ituri, in NE DRCongo) described on basis of somewhat darker overall coloration, but not satisfactorily distinguishable, as variation not constant. Monotypic.
Distribution. Extreme SE Nigeria E to W Central African Republic, S to W PRCongo and N Angola (Cabinda); also N & E DRCongo (S to Itombwe) E to extreme W Uganda.



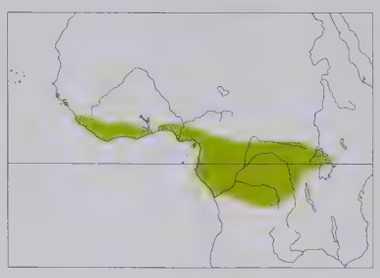
Descriptive notes. c. 22 cm; 39–54 g. Large bulbul with heavy bill, conspicuous long white throat feathers often puffed out, lax crown feathers raised in display. Head feathers are dark grey with black centres (appearing darker and more mottled than nape), feathers of ear-coverts with obvious white shafts, giving scaly appearance; lores grey, paler than rest of head, non-contrasting narrow grey feathered eyering; upperparts olive-green, contrasting bright rufous uppertail-coverts and tail; wings olive-green, primaries and secondaries browner on inner webs; throat white, contrasting conspicuously; breast pale grey, becoming yellowish-olive on belly and flanks, and gingery-yellow on undertail-coverts; iris dark brown or dark red; bill dark blue-grey, slightly paler lower mandible; legs dark grey to black. Differs from *C. calurus* in larger size, more brightly rufous tail, grey (not olivaceous) breast, duller yellow belly. Sexes alike, female on average smaller than male. Juvenile has yellow gape. Voice. Soft, quavering, mournful 2-note song, "houuu-wuuuuuuuh", second note higher-pitched and extended.
Habitat. Evergreen and semi-deciduous forest and swamp-forest; mainly in lowlands, but recorded to 1800 m in E DRCongo.
Food and Feeding. Arthropods, including orthopterans and beetles (Coleoptera); also some fruit. Usually in shy but noisy groups of 3–5 individuals, in dry season up to 7–8; more rarely, solitary or in pairs. Sometimes joins mixed-species parties, and often follows *Dorylus* ant swarms. Forages mainly in lower stratum, usually below 15 m, sometimes higher during dry season. Gleans insects from leaves and, especially, from cracks in bark; likes matted vines and tangles of small branches. Frequently puffs out throat feathers, thought possibly to be a contact signal.
Breeding. Aug and Nov–Mar (mainly in Dec–Mar short dry season) in Gabon; laying recorded Dec–May, but breeding throughout year suspected, in DRCongo; birds in breeding condition in Mar and Aug in Cameroon. May breed co-operatively. Territorial. Nest a sturdy shallow cup, outer wall of twigs and moss, inner wall of thin plant stems, lined with hyphae of *Marasmius* fungus, stems up to 30 cm long of epiphytic fern *Microgramma owariensis* incorporated into rim (leaves are left on stem, remain green throughout), one nest had external diameter 9·2 cm and internal 7 cm; built 0·5–2 m above ground, often on terminal shoot of the understorey shrub *Alchornea floribunda*, nest becomes bound to base of wood fragments and dead leaves by growth of a fungal mycelium. Clutch 2 eggs, rarely 1; incubation by female only, period at least 14 days; no information on nestling period. Of 35 nests observed, 74% were preyed on; of nine successful nests, three produced two fledglings each and six produced only one each.
Movements. Sedentary within apparently large home range; of 23 individuals ringed in Gabon, only five were retrapped, over intervals of up to 49 months.
Status and Conservation. Not globally threatened. Widespread and generally fairly common. Estimated density in Gabon 7–8 groups/km². Occurs in a number of national parks, including those of Cross River, in Nigeria, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, and Semliki, in Uganda; present also in Okapi Faunal Reserve, in DRCongo.
Bibliography. Bannerman (1936, 1953), Beresford (2002), Borrow & Demey (2001), Britton (1980), Brosset (1971a, 1971b), Brosset & Érard (1986), Chapin (1953), Chappuis (1975), Christy & Clarke (1994), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Hall & Moreau (1970), Karr (1976), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Pasquet *et al.* (2001), Prigogine (1971), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002).

92. Red-tailed Greenbul

Criniger calurus

French: Bulbul à barbe blanche **German**: Swainsonbülbül **Spanish**: Bulbul Colirrojo
Other common names: White-bearded Greenbul

Taxonomy. *Trichophorus calurus* Cassin, 1856, Moonda River, Gabon.
Genus previously considered close to *Alophoixus*, and latter often merged with it; recent molecular evidence, however, strongly supports the view that the relationship between the two groups is remote, despite close similarity in appearance. Has often been regarded as conspecific with *C. ndussumensis* owing to similarity in appearance, but the two differ both vocally and morphologically. Published reports of hybridization between latter and race *emini* of present species in NE DRCongo seem to be based on observation of individuals apparently showing combination of characters then thought to be restricted to each form. Three subspecies recognized.
Subspecies and Distribution.
C. c. verreauxi Sharpe, 1871 – SW Senegal and SE Guinea-Bissau E to SW Nigeria.
C. c. calurus (Cassin, 1856) – SW Nigeria E to W DRCongo, also Bioko I.
C. c. emini Chapin, 1948 – W DRCongo and NE Angola E to Uganda and W Tanzania.
Descriptive notes. c. 20 cm; 26–32·5 g (nominate); male 33–40·5 g, female 33–37·5 g (*verreauxi*), male 22–34 g, female 25–30 g (*emini*). Handsome bulbul with conspicuous tufted white throat feathers, often puffed in display. Nominate race has crown dark olive-brown, slightly greyer on hindneck; ear-coverts with white feather shafts (slightly scaly effect); wide area in front of, above and behind eye sparsely feathered pale blue-grey, lores similarly coloured, creating conspicuous spectacled appearance; upperparts olive-green, contrasting rufous uppertail-coverts and tail; throat white; breast side, flanks and narrow band across upper breast dull olive-green, remainder of breast and belly much brighter yellow, undertail-coverts sometimes slightly more rufous; iris red-brown; bill blue-grey, darker dorsally; legs blue-grey. Distinguished from very similar *C. ndussumensis* by marginally brighter tail, slightly longer and broader bill, but mainly by voice; from *C. chloronotus* by smaller size, brighter underparts, duller tail. Sexes alike, female on average smaller than male.



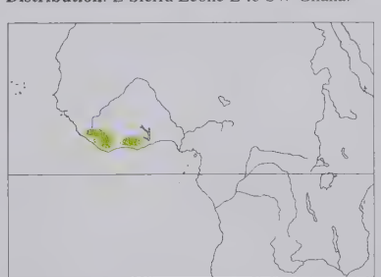
Juvenile differs from adult in having dull cinnamon fringes on upperwing-coverts. Race *verreauxi* is darker green above than nominate, uppertail-coverts and tail with little rufous (in the field appearing concolorous with back); *emini* is intermediate, similar to nominate but with tail-coverts and tail duller rufous. Voice. Song a cheerful, rising "chup-chup-chwirulup" or "tsik-tyu-tyip"; also a rapid series, "tyutyu-tyutyu-tyip-tyiptyip", and alarm a sharp "tsik".
Habitat. Evergreen and semi-deciduous forest, gallery forest and forest–savanna mosaic; also older secondary forest and edge habitats. Mainly lowlands, but recorded to 1000 m in Liberia, 950 m in Cameroon, 1750 in DRCongo and 1500 in Uganda.
Food and Feeding. Arthropods, including beetles (Coleoptera), bugs (Hemiptera), orthopterans, lepidopterans (including caterpillars), ants (Hymenoptera), spiders (Aranea); also small lizards; some berries and other fruit (including *Ficus*) and seeds. Occurs in groups of 3–10 individuals, sometimes a dozen. A conspicuous and constant component of mixed-species parties; sometimes attends *Dorylus* ant swarms. Forages from low to middle levels, 4–20 m; uses relatively narrow, more or less horizontal branches and twigs as perches from which to glean food from leaf surfaces, crevices, tangles of dead leaves and vines, etc. Also makes aerial sallies to pick berries and to take insects off leaves.
Breeding. Juveniles in Nov–Jan and birds in breeding condition Jun–Jul, Sept and Nov in Liberia; dependent juvenile in May in Ivory Coast; laying in Feb, Apr–Aug and Dec in Cameroon and in Feb–Mar and Nov (and breeding condition Aug) in Bioko; laying in Dec–Feb short dry season (and breeding condition Aug) in Gabon; in breeding condition in Jun in Central African Republic; breeding recorded in all months in DRCongo; laying in Jun, juveniles in Apr and Jul and birds in breeding condition in May and Nov in Uganda. Strongly territorial. Nest a cup made of rootlets and twiglets built on base of stiff dry leaves, and attached by a dense network of cobwebs, one had external diameter 11 cm and internal 6·5 cm; placed 1·8–2·8 m above ground in fork between petiole of a large leaf and main stem of bush. Clutch 2 eggs; incubation by female only, no information on period; chicks fed by both parents, leave nest at 14 days; one newly fledged young seen both to feed itself and to receive food repeatedly from several members of its group. Of four nests in Gabon, one was destroyed, the other three produced two young each.
Movements. Resident. Of 50 individuals ringed in Gabon, 22 were retrapped at same place, one after 25 months and one after 49.
Status and Conservation. Not globally threatened. Common and widespread throughout its extensive range. Estimated to occur in densities of 12 groups/km² in Gabon and 1 bird/5 ha in Nigeria. Adapts well to older secondary habitats. Occurs in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Cross River, in Nigeria, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, Salonga, in DRCongo, and Semliki, in Uganda.
Bibliography. van den Akker (2000), Bannerman (1936, 1953), Barlow *et al.* (1997), Beresford (2002), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1986), Brown & Britton (1980), Carswell (1986), Chapin (1953), Chappuis (1975), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire (1996), Dowsett-Lemaire & Dowsett (1991), Eisentraut (1973), Elgood *et al.* (1994), Field (1979), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Friedmann & Williams (1971), Gatter (1997), Gore (1990), Grimes (1987), Hall & Moreau (1970), Jackson & Sclater (1938), Johnson, D.N. (1989), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Morel & Morel (1990), Nikolaus (1987), Pasquet *et al.* (2001), Pérez del Val (1996), Prigogine (1971, 1978, 1984), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985).

93. Yellow-bearded Greenbul

Criniger olivaceus

French: Bulbul à barbe jaune **German**: Olivrückenbülbül **Spanish**: Bulbul Barbigualdo
Other common names: Yellow-throated Olive Greenbul/Bulbul

Taxonomy. *Trichophorus olivaceus* Swainson, 1837, West Africa.
Genus previously considered close to *Alophoixus*, and latter often merged with it; recent molecular evidence, however, strongly supports the view that the relationship between the two groups is remote, despite close similarity in appearance. Considered by some authors to form a superspecies with *C. ndussumensis*; others regard the two as conspecific, on basis of vocal and behavioural similarities (responds to playback of song of that species). Considerable differences in coloration suggest that, although unquestionably closely related, the two are better treated as distinct species; this supported by results of recent molecular studies, which even suggest that present species is sister-taxon of *C. calurus*, rather than of *C. ndussumensis*. Monotypic.
Distribution. E Sierra Leone E to SW Ghana.



Descriptive notes. c. 18 cm; male 25·5–31·5 g, female 23·5–29·5 g. Relatively small greenbul with puffed-out throat feathers. Head and upperparts, including wings, are olive-green, crown often darker and browner; ear-coverts streaked yellowish-white, lores yellowish, narrow orbital ring of sparse blue-grey feathers; tail faintly washed rufous, not obviously contrasting; throat bright yellow, conspicuous against green underparts, latter becoming yellowish in centre of belly; iris deep brown to red-brown; bill dark grey; legs dark blue-grey. Distinguished from *C. barbatus* by smaller size, lack of grey mottling in plumage of breast, ear-coverts and mantle, contrasting eyering, also shorter-looking throat feathering (less frequently "inflated"). Sexes alike. Juvenile said to be browner above and duller below; one fully grown immature was indistinguishable from adult. Voice. Song 3 short, low-pitched syllables with third slightly stressed, "whut-chruw-chruw", similar in structure to that of *C. calurus* but lower in pitch and sounding less sprightly; indistinguishable from song of *C. ndussumensis*.
Habitat. Largely restricted to primary and well-developed secondary lowland evergreen and semi-deciduous forest; found also in gallery forest in parts of Liberia, but generally absent from this habitat (at least at lower altitude at E end of range). Much less common in logged and young regenerating forest. Recorded up to 900 m.

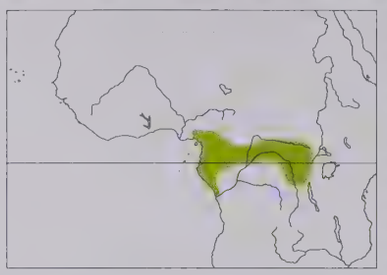
Food and Feeding. Mainly insectivorous, but small fruits also taken. Occurs singly or, more usually, in pairs, sometimes in small family parties; often in mixed-species flocks, including with its two sympatric congeners. Generally unobtrusive and quiet. Forages mainly at 3–10 m, occasionally up to 25 m, generally higher than *C. barbatus*. Has distinctive habit of often foraging on vertical stems and trunks, clinging to them in a manner reminiscent of European nuthatches (*Sitta*) and also of the E African *Andropadus masukuensis*. Gleans bark; forages in epiphytes and on lianas, often hanging upside-down.
Breeding. Data from Liberia include individual carrying nest material in Sept, downy fledgling and female in breeding condition in Nov, and almost fully grown immature in Jan; dependent young reported in Apr in Sierra Leone and in Apr and Nov in Ivory Coast; birds in breeding condition in May in Guinea. No other information.
Movements. No information; assumed to be sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Upper Guinea Forests EBA. Rare to uncommon across much of its fragmented range. Seems to be commonest in Liberia, where it occurs across much of NW & NE of the country, including Sapo National Park, and national population estimated at 120,000 pairs. In Sierra Leone, population in Gola Forest estimated at 750–1600 individuals; occurs also in the better-protected Loma Mountains Non-hunting Forest Reserve. In Ivory Coast, uncommon in Taï Forest National Park but more common farther E, in the less well-protected Yapo Reserve. Rediscovered in SW Ghana in late 1980s, and recent surveys have shown it to be more widespread than originally thought; recorded in Bia and Kakum National Parks. Earlier reports from Senegal and Mali are now thought to be erroneous. Main threats are logging of forests and consequent settlement and smallholder agriculture.
Bibliography. Allport (1991), Allport *et al.* (1989), Atkinson *et al.* (1996), Bannerman (1936, 1953), Barlow *et al.* (1997), Borrow & Demey (2001), Britton (1972), Butchart & Stattersfield (2004), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Colston & Curry-Lindahl (1986), Demey (2002), Demey & Fishpool (1994), Demey & Rainey (2004), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Field (1979), Fishpool & Evans (2001), Fishpool *et al.* (1994a), Gartshore *et al.* (1995), Gatter (1997), Grimes (1987), Hall & Moreau (1970), Halleux (1994), Keith *et al.* (1992), Mackworth-Praed & Grant (1973), Morel & Morel (1990), Pasquet *et al.* (2001), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Thiollay (1985).

94. White-bearded Greenbul

Criniger ndussumensis

French: Bulbul de Reichenow **German**: Weißbartbülbül **Spanish**: Bulbul Barbiblanco
Other common names: Slender-billed Bearded Bulbul

Taxonomy. *Criniger verreauxi ndussumensis* Reichenow, 1904, Ndussuma country, Kinjawanga and Bellima, near Beni, DRCongo.
Genus previously considered close to *Alophoixus*, and latter often merged with it; recent molecular evidence, however, strongly supports the view that the relationship between the two groups is remote, despite close similarity in appearance. Taxonomic history confused. Sometimes treated, on basis of structural, behavioural and vocal similarities, as a race of *C. olivaceus* (which responds to playback of song of present species), but significant plumage differences suggest that, although clearly closely related, the two are better treated as distinct species; this interpretation supported by results of recent molecular studies. Alternatively, has often been considered conspecific with *C. calurus* because of its close similarity in appearance to sympatric races of latter, but differs in both voice and morphology (suspected differences in foraging behaviour not proven, owing to difficulty of distinguishing between the two species in the field). Published reports of hybridization with *C. calurus* (of race *emini*) in NE DRCongo seem to be based on observation of individuals apparently showing combination of characters then thought to be restricted to each form. Further work needed to clarify the situation. Monotypic.
Distribution. SE Nigeria E to E DRCongo (Semliki and Itombwe), S to coastal PRCongo; not known to occur across much of intervening region in S part of this range.



Descriptive notes. c. 18 cm; 24·5–31 g. Relatively small bulbul with conspicuous tufted white throat feathers, sometimes puffed in display. Has crown olive-brown, greyer on hindneck, white streaking on ear-coverts, contrasting pale blue-grey feathering behind, above and in front of eye; upperparts olive-green, dull rufous-cinnamon uppertail-coverts and tail contrasting with back; conspicuous white throat, contrasting with olive-green upper breast; remainder of breast and belly much brighter yellow, flanks strongly washed dull olive, undertail-coverts cinnamon-buff; iris red-brown; bill blue-grey, darker dorsally; legs blue-grey. Distinguished from extremely similar *C. calurus* (mainly of E races) by reputedly paler (greyish-white) lores, narrower and slightly shorter bill, also by undertail-coverts on average more cinnamon-rufous and flanks more heavily washed olive (but overlap in characters); reliably separated in the field only by voice. Sexes alike, female on average smaller than male. Juvenile undescribed. VOICE. Song 3 short harsh syllables on even, relatively low pitch, emphasis on last syllable, "whut-chruw-chruw" or "chuk-yer-chyer", indistinguishable from that of *C. olivaceus*; song structure resembles that of *C. calurus*, but lower-pitched and lacking latter's sprightly quality. Call a nasal, rather frog-like "quek-quek" or "queg-queg", not recorded for *C. olivaceus*. Alarm "tsik" or "tchic", as for *C. calurus*.
Habitat. Primary and well-developed secondary lowland evergreen and semi-deciduous forest and swamp-forest. Further details lacking, owing to confusion with *C. calurus*.
Food and Feeding. Mainly insectivorous; recorded as taking figs (*Ficus*) in PRCongo. Usually in pairs or family parties; often in mixed-species flocks, often alongside *C. calurus*. Generally unobtrusive and quiet. Further details uncertain, owing to confusion with *C. calurus*. By inference, it is probable that it has same behaviour as its W African vicariant *C. olivaceus*, that of foraging extensively on vertical stems and trunks; birds are commonly seen exhibiting this behaviour in Lower Guinea and Congo Basin forests, and it is likely that reports of *C. calurus* behaving this way refer, in fact, to present species.
Breeding. Fledgling recorded in Feb in Cameroon. No other definite information.
Movements. No information; likely resident.
Status and Conservation. Not globally threatened. Status uncertain, as confused with *C. calurus*; known to be less common and widespread than that species. Range is, however, extensive, and this species is known to occur in numerous protected areas, including Cross River National Park, in Nigeria, Korup National Park, in Cameroon, Nouabalé-Ndoki National Park, in PRCongo, and Okapi Faunal Reserve, in DRCongo.
Bibliography. Beresford (2002), Borrow & Demey (2001), Chapin (1953), Chappuis (1975), Christy & Clarke (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire (1996), Dowsett-Lemaire & Dowsett (1991, 2001a), Eisentraut (1973), Elgood *et al.* (1994), Field (1979), Fishpool & Evans (2001), Friedmann & Williams (1971), Germain & Cornet (1994), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1973), Pasquet *et al.* (2001), Prigogine (1971), Rand (1958), Rand *et al.* (1959), Rodewald *et al.* (1994), Sargeant (1993), Schouteden (1957), Serle (1965a), White (1956).

PLATE 22 ➤


PLATE 22
inches 3
cm 8
95
96
ssp pallidus
ssp annamensis
ssp griseiceps
97
ssp hallae
ssp sumatranus
98
99
ssp bres
ssp gutturalis
ssp ochraceus
ssp ruficrissus
ssp connectens
100
ssp phaeocephalus
ssp diardi
ssp indica
101
ssp guglielmi
102
103

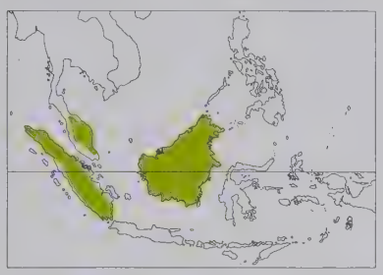
Genus *ALOPHOIXUS* Oates, 1889

95. Finsch's Bulbul

Alophoixus finschii

French: Bulbul de Finsch **German**: Finschbülbül **Spanish**: Bulbul de Finsch
Other common names: Finsch's Bearded/Dwarf (Bearded) Bulbul

Taxonomy. *Criniger finschii* Salvadori, 1871, Borneo.
Genus often merged with *Criniger*; recent molecular evidence, however, strongly supports the view that the relationship between the two is remote, despite close similarity in appearance. Present species highly divergent in terms of morphology, behaviour and voice, possibly merits isolation in monotypic genus; thorough review necessary. Putative race *theiodes* (= *theoides*) only very weakly differentiated. Monotypic.
Distribution. Extreme S Thailand, Peninsular Malaysia, Sumatra and Borneo.



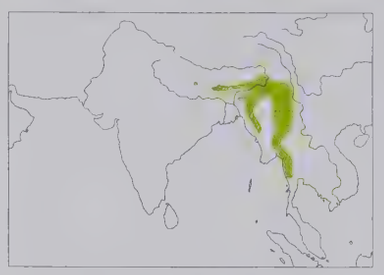
Descriptive notes. 16·5–17 cm; 22–25 g. Medium-sized, dull, unobtrusive bulbul with distinctively short bill. Side of head is brownish-olive, greenish tint on ear-coverts and neck side; cap to uppertail-coverts warm brownish-olive, tail-coverts slightly rufous-tinged; upperwing similar, outer webs of tertials and secondaries brighter and fringed distinctly olive, primaries brownish-olive with green tinge on outer webs; tail uniform dark olive-brown with chestnut tint; chin and throat creamy yellow, forming triangular patch (often puffed out); breast light olive with creamy-yellow feather fringing, darkening to dull grey-green at side and on flanks; belly and undertail-coverts plain creamy yellow, brighter on belly; iris pale yellowish-brown to orange-brown; upper mandible blackish, lower mandible plumbeous; legs dark horn to reddish-brown. Sexes alike. Juvenile apparently very similar to adult. Voice. Not well known. Usually very quiet, but said to give simple series of notes, transcribed as "choi-choi-chong-choi, choi-choi", and a "very musical and pleasant song" (Borneo); existence of this song debatable, and description should be regarded as provisional. Contact calls between foragers include subdued "wek" or "twut", sometimes given in flight; also has loud, nasal, explosive "hwuiikt" and harsh grating "screee" notes, probably as alarm.
Habitat. Usually in primary and selectively logged evergreen forest in lowlands, avoiding heavily logged sites and younger regrowth, but entering secondary growth and mature or overgrown plantations (e.g. cocoa and *Albizia*). Visits forest edges, particularly where fruiting trees abound, but generally avoids isolated trees and larger clearings. From near sea-level to 750 m in Peninsular Malaysia, to 650 m in Sumatra, and to 900 m in Borneo (where it appears to be more common in foothill habitats).
Food and Feeding. A generalist; eats fruit and insects. Especially fond of berries of *Trema* and figs of riverside banyans (e.g. *Ficus microcarpa*); also tall, canopy-cropping fig species, including six of 25 species of *Ficus* (in mean minimum fruit-diameter range 5·4–14·8 mm) in study at Kerau, in Peninsular Malaysia. Usually found singly or in pairs, but occasionally in small parties of up to eight individuals. Forages at all levels, including emergent crowns, but mostly in middle storey and subcanopy; comes lower to fruiting shrubs, saplings and vines, and sometimes visits *ladang* (traditional shrubby agricultural fields) during mass fruiting events. Sometimes accompanies high-level mixed-species foraging flocks, and makes short sallies after large insects from low or high perches.
Breeding. Recorded in Mar–Jul. Nest built by both pair-members; nest undescribed, but pair in mature forest gathered material at canopy level; probably nests higher above ground than do most bulbuls. Fledglings tended by both parents. No other information.
Movements. Presumably resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Generally uncommon or rare; possibly overlooked. Status in Sumatra was, until recently, enigmatic; apart from 12 specimens taken in N of island, the species is now known from C Sumatra, where seen several times near Kerinci-Seblat National Park (in Jambi province) in 1996. Occurs in a range of protected areas, including Hala-Bala Wildlife Sanctuary, in Thailand, Taman Negara National Park and Kerau Wildlife Reserve, in Peninsular Malaysia, and, in Borneo, Danum Valley Conservation Area (Sabah) and Gunung Palung National Park (Kalimantan). In all these areas it is rare or difficult to find, perhaps being most common at Kerau. Because it is restricted to closed-canopy forest at relatively low altitudes, it is more susceptible than are most species to the deforestation which continues apace in the Sundaic realm.
Bibliography. van Balen (2001), Collar *et al.* (2001), Davison (1987), Dickinson *et al.* (2002b), Duckworth & Kelsh (1998), Gibson-Hill (1949), Gore (1968), Holmes (1996, 1997), Hose (1893), Hume (1876a, 1879), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), MacKinnon & Phillipps (1993), Mann (1987), van Marle & Voous (1988), Medway & Wells (1976), Mitra & Sheldon (1993), Robinson & Kloss (1920), Robson (1996a, 2000), Smythies (1957, 1999), Stattersfield & Capper (2000), Thompson (1966), Vowles & Vowles (1997), Wells (2005), Wilkinson, Dutson, Sheldon *et al.* (1991).

96. White-throated Bulbul

Alophoixus flaveolus

French: Bulbul flavéole **German**: Weißkehl-Haubenbülbül **Spanish**: Bulbul Frentigrís
Other common names: Ashy-fronted (Bearded) Bulbul, Yellow-bellied Bulbul(!)

Taxonomy. *Trichophorus flaveolus* Gould, 1836, Himalayan Mountains = Nepal.
Genus often merged with *Criniger*; recent molecular evidence, however, strongly supports the view that the relationship between the two is remote, despite close similarity in appearance. Putative races described from Assam, in NE India, *viridulus* (Lushai Hills) and *aureolus* (Naga Hills), are considered indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
A. f. flaveolus (Gould, 1836) – Himalayan foothills from C Nepal E to Bhutan, NE India (Arunachal Pradesh, and S Assam hills including Meghalaya, and Lushai Hills), SE Tibet (in territory claimed by India), NE & SE Bangladesh (Sylhet, Chittagong) and NW & NE Myanmar (Chindwin, Arakan).
A. f. burmanicus (Oates 1889) – S China (W Yunnan), SE Myanmar (Karen Hills, Southern Shan States, Tenasserim) and W Thailand.



Descriptive notes. 21·5–22 cm; male 38–54 g, female 38–48 g. Bulky, brash, conspicuous bulbul with fairly stout bill, adult with spindly, pointed crest (sometimes curved forward), elongated throat feathers often held erect, as if brushed the wrong way. Nominate has bronzy-olive crown and crest, distinctly whitish lores, white-streaked grey ear-coverts, long fine hairs emerging from nape; upperparts bronzy olive, wings and tail rufous-brown; throat white, underparts bright yellow from breast to undertail-coverts; iris brown; bill variable, often mostly pale bluish-grey, particularly at cutting edges and around base; legs silvery grey, pale leaden grey or pale fleshy brown. Sexes similar. Juvenile has browner crest and upperparts, more rufescent wings, distinctly duller yellow (almost brownish) underparts, darker bill. Race *burmanicus* is smaller than nominate, with darker crown; juvenile said to be rather uniform brown with throat whiter, upperparts and wings more rufescent brown than adult, and underparts suffused brown. Voice. Noisy, heard more often than seen. Wide variety of calls, all short and nasal, with no identifiable song. Commonest calls are loud, short, very nasal, strident single hiccup-like "nyak, nyark, nyark" or "nyeek!" notes, repeated at variable rates, often relatively slowly; higher-pitched "yap" when alarmed, often alternately or in chorus by multiple individuals; also noted are shriller, upslurred "shree-shree-shree", and a series of tinny, nasal notes which starts quite slowly and then rises in pitch and accelerates. Most vocalizations similar to those of *A. pallidus* but sharper and higher-pitched.
Habitat. Occurs in understorey or middle storey of primary and secondary evergreen forest, usually at 600–1200 m, rarely up to 1500 m. Some individuals descend to lowlands in winter, when regularly found in more open scrub and bushes, sometimes bordering cultivation.
Food and Feeding. Diet primarily fruit, including berries; recorded as eating gooseberries (*Phyllanthus emlica*) in NE India; also eats insects. Roves in tight-knit parties of 6–15 individuals in winter, creeping and clambering through vegetation in manner of some laughingthrushes (*Garrulax*), following each other closely and flying across gaps in single file. Usually forages within 3 m of ground.
Breeding. Breeds Apr–Jul. Nest reportedly built by both sexes, outer layer constructed of dead leaves and bamboo leaves, fairly loosely fastened together with fine fern rootlets and elastic stems, inner layer also of dead leaves, very strongly bound and lined with fern roots; placed 0–3 m above ground, usually below 1 m, in thick low vegetation (including weeds and brambles) or vine tangle, often near stream. Clutch 3–4 eggs; incubation possibly by both sexes, period 13 days; chicks fed by both parents, no information on nestling period.
Movements. Resident; tends to move downslope in some regions during non-breeding season.
Status and Conservation. Not globally threatened. Generally common throughout range; rare in S China. Very local in Bangladesh, but fairly common at a few sites in Nepal, and very common in suitable habitat in NE India, Bhutan and Myanmar. Able to tolerate considerable degradation and fragmentation of forest. In Nepal occurs in Royal Chitwan National Park, the extreme W locality for the species.
Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Birand & Pawar (2004), Cheng Tsohsin (1987), Deignan (1956), Dickinson *et al.* (2002b), Grimmett *et al.* (1998), Harvey (1990), Hopwood (1912), Hume (1888), Inglis (1896), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Koelz (1954), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Mears & Oates (1907), Meyer de Schauensee (1984), Riley (1938), Ripley (1982), Robson (2000), Scully (1879), Singh (1995), Smythies (1986), Stanford & Mayr (1940–1941), Stevens (1914–1915, 1923–1925), Stuart Baker (1892–1893, 1922–1930), Ticehurst (1933).

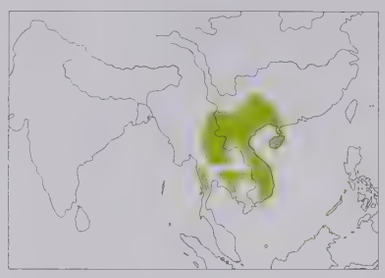
97. Puff-throated Bulbul

Alophoixus pallidus

French: Bulbul pâle **German**: Blassbauch-Haubenbülbül **Spanish**: Bulbul Pálido
Other common names: Olivaceous (Bearded) Bulbul

Taxonomy. *Criniger pallidus* Swinhoe, 1870, Hainan, China.
Genus often merged with *Criniger*; recent molecular evidence, however, strongly supports the view that the relationship between the two is remote, despite close similarity in appearance. Separation of various races problematical, and listed details provisional; full review necessary in order to establish validity and precise distribution of each. Putative race *grandis* (from Yunnan, in S China) considered indistinguishable from *henrici*. Seven subspecies recognized.
Subspecies and Distribution.
A. p. griseiceps (Hume, 1873) – S Myanmar (Pegu Yomas).
A. p. robinsoni (Ticehurst, 1932) – S Myanmar (Tenasserim).
A. p. henrici (Oustalet, 1896) – S China (S Yunnan E to E Guangxi), N Thailand, N & C Laos and N Vietnam (Tonkin).
A. p. pallidus (Swinhoe, 1870) – Hainan.
A. p. isani (Deignan, 1956) – NE Thailand.
A. p. annamensis (Delacour & Jabouille, 1924) – C Vietnam (N & C Annam).
A. p. khmerensis (Deignan, 1956) – S Laos, Cambodia (except SW) and C Vietnam (C & S Annam).
Descriptive notes. 22–25 cm; 41–52 g. Large, noisy, conspicuous bulbul, crown feathers elongated to form distinct, moderately pointed crest, often raised, elongated throat feathers often puffed out as if combed the wrong way. Nominate race has forehead, crown and nape greyish-brown, lores, cheeks and ear-coverts dusky whitish-grey; upperparts, including lesser wing-coverts, dull olive-green, uppertail-coverts with slight rufescent tinge; tail feathers rufous-brown, outer webs fringed olive-green with rufescent tinge; greater and median wing-coverts brown, slightly rufescent, fringed dull olive-green; flight-feathers pale brown on inner webs, slightly rufescent olive-green on outer webs, most obviously on secondaries and tertials; chin and throat white, breast and belly pale ochraceous yellow, duskier on sides and flanks; vent and undertail-coverts pale ochraceous buff; iris greyish-

On following pages: 98. Ochraceous Bulbul (*Alophoixus ochraceus*); 99. Grey-cheeked Bulbul (*Alophoixus bres*); 100. Yellow-bellied Bulbul (*Alophoixus phaeocephalus*); 101. Yellow-browed Bulbul (*Acritillas indica*); 102. Hook-billed Bulbul (*Setornis criniger*); 103. Hairy-backed Bulbul (*Tricholestes criniger*).



brown to light umber (possibly age-related difference); bill bluish-grey, darker on culmen and tip of upper mandible, paler base and cutting edges; legs pinkish-brown, claws pale horn. Distinguished from *A. flaveolus* by much less yellow underparts, off-white throat, buffier undertail-coverts, duskier head side; from *A. ochraceus* by darker underparts, usually with stronger yellow infusion. Sexes alike. Juvenile resembles adult, but upperparts and underparts slightly paler and brighter, with slight gold suffusion, throat feathers shorter, eyes probably duller. Race *griseiceps* is greener above than nominate, with greyer crown, more whitish-grey lores and ear-coverts, much yellower breast and belly, deeper yellowish buff undertail-coverts; *robinsoni* has duller yellow underparts, duller olive upperparts, less contrast between head and mantle; *henrici* is relatively large, with white throat and pale underparts; *isani* is similar to previous, but differs in having the olivaceous brown of mantle paler and greyer; *annamensis* is also similar, but smaller, with slightly darker, yellower underparts, stronger olive wash on upperparts; *khmerensis* has slightly darker breast and flanks, deeper yellow abdomen, and stronger chestnut tone on upperparts. Voice. Foraging parties give loud scolding calls semi-constantly; no identifiable song. Usual vocalization a harsh, raucous, abrupt "churt churt churt…, chutt-chutt-chutt…", or "chutt-chutt, chik-it chik-it". Also reported to give weak "twee, twee, twee".

Habitat. Broadleaf evergreen forest and open woodland in lowlands and foothills, locally up to 1800 m.

Food and Feeding. Diet mainly berries, although some insects taken; will also take nectar, but much less often than do *Hypsipetes* species. Usually found in middle storey of forests, often in small vociferous groups of 3–6.

Breeding. Breeds Mar–Sept. Observations at one nest suggested that three adults fed young, but whether co-operative breeding is the usual strategy is not known; further study required. Nest a fairly deep neat cup made from dry leaves, lined with fine aerial roots of woody climbers, held together by, and attached to branch at rim with, spider webs and fine, black, hair-like fibres of fungal mycelium; in Thailand placed 1–5 m up in horizontal fork of small branch of sapling or in fallen branch of larger tree. Clutch 2–3 eggs; incubation period 12–13 days; nestling period 10–11 days.

Movements. Apparently resident.

Status and Conservation. Not globally threatened. Very common in S China and Hainan; common in most other parts of its range, including S Myanmar, much of Thailand and N Laos. Seems to tolerate a fair degree of habitat disturbance, and therefore not considered to be at any risk.

Bibliography. Cheng Tsohsin (1987), Davidson (1998), Deignan (1956), Dickinson *et al.* (2002b), Duckworth & Hedges (1998), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Hume & Davison (1878), Lekagul & Round (1991), MacKinnon & Hicks (1996), MacKinnon & Phillipps (2000), Meyer de Schauensee (1934, 1984), Oustalet (1903), Pierce *et al.* (2004), Riley (1938), Robinson & Kloss (1919a), Robson (2000), Round (1982), Smythies (1986), Stepanyan (1995), Strange (2002), Swinhoe (1870), Thewlis *et al.* (1996), Ticehurst (1933), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002).

98. Ochraceous Bulbul

Alophoixus ochraceus

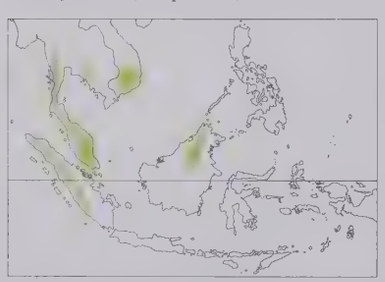
French: Bulbul ocré **German**: Rostbauchbülbül **Spanish**: Bulbul Ocráceo
Other common names: Ochraceous Bearded Bulbul, Brown White-throated Bulbul

Taxonomy. *Criniger ochraceus* F. Moore, 1854, Mergui, Tenasserim, Myanmar.

Genus often merged with *Criniger*; recent molecular evidence, however, strongly supports the view that the relationship between the two is remote, despite close similarity in appearance. If genera thus combined, race name *cabanisi* invalid, as preoccupied, and then replaced by name *sordidus*. Individual recently sighted in NE Cambodia was not racially identified, but probably involved *hallae*. Putative race *crinitus* (described from SW Thailand) considered indistinguishable from nominate. Several other proposed races have been synonymized in the past and are barely distinguishable; thorough review required. Eight subspecies recognized.

Subspecies and Distribution.

A. o. ochraceus (F. Moore, 1854) – SW Thailand and S Myanmar (Tenasserim S of Ye).
A. o. cabanisi (A. Müller, 1882) – S Thailand and C Peninsular Malaysia.
A. o. sacculatus (Robinson, 1915) – S Peninsular Malaysia and Singapore.
A. o. cambodianus (Delacour & Jabouille, 1928) – SE Thailand and SW Cambodia.
A. o. hallae (Deignan, 1956) – S Vietnam (S Annam, Cochinchina).
A. o. sumatranus (R. G. W. Ramsay, 1882) – W Sumatra.
A. o. fowleri (Amadon & Harrisson, 1957) – N Borneo.
A. o. ruficrissus (Sharpe, 1879) – NE Borneo.



Descriptive notes. 19–22 cm; 35–46 g. Bulky, very noisy, conspicuous bulbul with large bill, elongated hindcrown feathers forming crest, typically held half-erect, elongated throat feathers often puffed out, especially when calling. Nominate race has lores and upper face ashy grey or greyish-white, lower face and ear-coverts ashy brown, streaked paler, cap rufous-brown, clearly demarcated against lores; upperparts olive-brown, slightly rufescent on uppertail-coverts; upperwings olive-brown, brighter fringing on flight-feathers; tail dark, chestnut-washed olive-brown, slightly paler on extreme tips; chin and throat whitish, sharply demarcated against face; breast and belly ashy brown (browner at side and flanks) with dull tawny-cream feather edging, sometimes tinged yellowish; undertail-coverts uniform pale tawny; iris rich brown to dull red (variation possibly sex-related); upper mandible dark brown, cutting edges and lower mandible paler greyish-brown or silvery; legs fleshy brown to purplish-brown. Differs from very similar *A. pallidus* in slightly smaller size, shorter crest, duller (browner) and less olive upperparts, no yellow tinge below. Sexes similar, male on average considerably larger than female and may have redder iris. Juvenile has wings and tail more rufescent than adult, iris duller and browner. Race *cabanisi* has slightly more rufous-brown wash on cap, uppertail-coverts and tail than nominate; *sacculatus* is slightly larger and darker than previous, more olive-tinged (less rufous-tinged) brown above, including on cap, with whiter throat, slightly darker ash-grey breast side and flanks; *cambodianus* has duller, less yellowish, upperparts and lighter underparts than last; *hallae* has yellowish-tinged underparts, very like sympatric form of *A. pallidus* (but larger, crest smaller and less erectile, head side less pure grey, paler and slightly less yellow and more buffier-tinged below, slightly paler buff undertail-coverts); *sumatranus* has head, including cap, greyish-brown (lacking rufous tones), throat pure white, underparts darker yellowish-olive, undertail-coverts deep reddish ochraceous; *ruficrissus* has reddish-brown crest and upperparts, brown ear-coverts, dull olivaceous underparts (slightly yellowish on breast), rich reddish-chestnut undertail-coverts; *fowleri* has crest grey with brown tinge, is generally similar to previous but generally greyer on ear-coverts and underparts, less rufous on upperparts and breast. Voice. Variety of loud, grating cackles, similar to those of *A. pallidus*. Commonest calls are raucous, coarse and repetitive, e.g. "chrrt chrrt chrrt chrrt…" or "chik-chik-chik-chik", normally preceded by fluty, nasal "eeyi" and "iiwu" notes; also deep, rich, chuckling phrases with many doubled notes, e.g. "chee-wau, chee-wau, chee-wau", "ti-kwau, ti-kwau, ti-kwau", "chit'it-chit'it-chit'it-chit'it", "chui-wek, chik-wek, chik-wek, chik-wek" and similar. Variable song a deliberate, warbled sequence, e.g. "chip, kerk, ka-duik duik", interspersed with chattering notes; in Borneo, songs said to have terminal emphatic "chee!", followed by variable number of lower steady "chu chu chu" notes. Also gives a series of melodious trisyllabic whistles.

Habitat. Broadleaf evergreen forest, either mature or regenerated back to more or less closed-canopy structure after disturbance; in Borneo, at least, found also in lower-stature, drier forests, and in tall secondary forest with major bamboo component. Level lowlands to slopes, ascending to 1700 m; apparently much higher on Mt Kinabalu (Borneo), where recorded up to 2650 m.

Food and Feeding. Mainly berries and other fruit; also insects. Fruits include *Phyllanthus emblica* and figs (*Ficus*), usually swallowed whole even if more than 1 cm across. In Borneo, diet mainly montane figs in diameter range 3–6 mm, and variety of berries and other fruit, including *Schefflera*, *Gironniera*, *Litsea cubica*, *Callicarpa*, climbing melastomes (*Melastoma*), and berries of introduced elder (*Sambucus nigra*). One record of hornet larvae being eaten, and several reports of aerial sallying to snatch winged termites (Isoptera) in flight; it seems certain that insects form a common dietary supplement. Associates in loose noisy parties of 4–8 individuals, feeding on fruit in trees and shrubs, where it often aggressively displaces smaller bulbuls. Usually found in upper understorey or middle storey, infrequently in canopy.

Breeding. Breeds Feb–Jun. Nest a deep cup-shaped structure suspended by rim from supports, in one instance constructed from twigs and dry leaves, in another from grass blades, its rim reinforced with silk, and lined with black fibres (tentatively identified as horsehair fungal hyphae); few nests described, most placed in sapling or tall bush, sometimes by and over forest path, once 2·5 m above ground in twig fork of lateral branch of sapling, another low down between stems of scrambling ferns. Clutch 2–3 eggs, rarely 4; no information on incubation and fledging periods; fledglings tended by both pair-members.

Movements. Resident.

Status and Conservation. Not globally threatened. Locally common throughout range; considered extremely common in S Myanmar and common in Borneo. Recent sighting (Jan 2002) in NE Cambodia possibly indicative of range extension. Although relatively reliant on mature forest, this species is not thought to be at any risk because it ascends slopes to fairly high altitudes where habitat more secure, and because it tolerates fairly extreme habitat fragmentation, surviving in rather small islands of forest. Occurs in a range of protected areas, including Nam Bai Cat Tien National Park, in Vietnam, Khao Yai National Park, in Thailand, Taman Negara National Park, in Peninsular Malaysia, and Mount Kinabalu National Park, in Borneo (Sabah).

Bibliography. Chasen & Hoogerwerf (1941), Daltry & Momberg (2000), Davison (1997a), Davison & Chew Yen Fook (1996), Deignan (1954, 1956), Gibson-Hill (1949), Gore (1968), Gregory-Smith (1997a), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), McClure (1964), Medway & Wells (1976), Müller (1882), Richmond (1900), Riley (1938), Robinson (1928), Robinson & Kloss (1919a), Robson (2000, 2002a), Robson *et al.* (1993b), Sharpe (1901), Smythies (1957, 1986, 1999), Strange & Jeyarajasingam (1996), Ticehurst (1933), Wells (2005).

99. Grey-cheeked Bulbul

Alophoixus bres

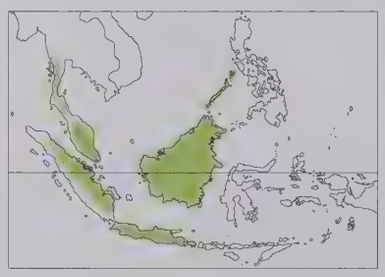
French: Bulbul brès **German**: Grauwangenbülbül **Spanish**: Bulbul Bres
Other common names: Grey-cheeked Bearded Bulbul, Olive White-throated Bulbul; Scrub Bulbul (nominate)

Taxonomy. *Lanius Bres* Lesson, 1831, Bogor, Java.

Genus often merged with *Criniger*; recent molecular evidence, however, strongly supports the view that the relationship between the two is remote, despite close similarity in appearance. Proposed taxon *bartelsi* (from Java) is a synonym of nominate. Putative race *balicus* (E Java, Bali) said to have browner ear-coverts than W Javan birds, but this feature also present on many specimens from latter region; better considered, therefore, a synonym of nominate. Four subspecies currently recognized.

Subspecies and Distribution.

A. b. tephrogenys (Jardine & Selby, 1833) – S Myanmar (Tenasserim S of c. 14° N), S Thailand, Peninsular Malaysia (not Singapore) and E Sumatra.
A. b. bres (Lesson, 1831) – Java and Bali.
A. b. gutturalis (Bonaparte, 1850) – Borneo.
A. b. frater (Sharpe, 1877) – W Philippines (Calamians, Palawan, Balabac).



Descriptive notes. 21·5–23 cm; 29–44 g, male 41–46 g and female 51–52 g (*gutturalis*). Bulky, very noisy, conspicuous bulbul with erectile hindcrown crest, throat feathers usually puffed out, especially when calling. Nominate race has lores and upper face mid-grey, shading more ash-grey to brown on ear-coverts; rest of cap dark rufescent olive-brown; upperparts from mantle to rump brownish-olive, uppertail-coverts brownish-chestnut, lighter and brighter than cap; upperwings brownish-olive, tertials and inner secondaries tinged slightly more rufous, flight-feathers fringed bright rufescent on outer webs; tail uniform chestnut-brown; chin and throat white; breast strongly washed with dark olive; upper flanks pale olive-brown, suffused with yellow, lower underparts creamy yellow, undertail-coverts washed ochraceous buff; iris brown to rich brownish-red (variation possibly related to age or sex); upper mandible dark plumbeous brown, lower mandible and cutting edges blue-grey; legs yellowish-pink to pinkish-brown, claws dusky flesh. Differs from *A. flaveolus* in darker grey head side;

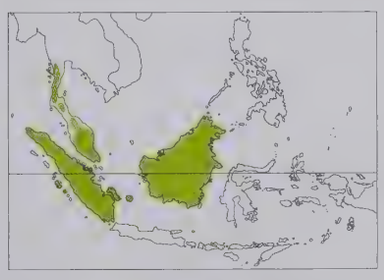
from *A. ochraceus* in shorter and less prominent crest, yellower belly. Sexes similar. Juvenile is very like adult, but wings more rufescent, head side tinged brown, iris duller brown. Race *tephrogenys* has light ash-brown wash on breast (broad pale yellow edging giving mottled effect), pale amber-yellow belly; *gutturalis* is dirtier brown above, least yellow below; *frater* is similar but slightly more greenish on mantle. Voice. Very variable. Seems to vocalize semi-constantly, producing wide range of melodious whistles. Song of clear, well-structured, ringing, mournful phrases, variously as "whi'u wiu iwi", "you yuwi", "cheeru cheeu cheeriu", "prii chiu chew chew" and similar, often followed by higher-pitched discordant notes (e.g. "iiu"); in Philippines (race *frater*), one song variant transcribed as "chip-pu chu-chu-chu-chu cha-wheeet"; throughout range, song phrases usually interspersed with harsh scolding notes or rattled "trrit" notes. Also gives muted "chirret".
Habitat. Mature broadleaf evergreen and mixed deciduous forest, also edges, overgrown plantations of exotic species; also second growth having layered, more or less closed-canopy structure, and where young regrowth stands alongside primary forest. At Pasoh research forest, in Negeri Sembilan (Peninsular Malaysia), one third more individuals trapped in mature forest than in 20-year regenerating forest, suggesting preference for former. Lowlands up to 1150 m, rarely to 1500 m; S of lowland range of *A. ochraceus* in Peninsular Malaysia, the commonest *Alophoixus* of submontane slopes.
Food and Feeding. A generalist, eating large amounts of both fruit and invertebrates. Various shade-layer fruits taken, including *Eurycoma longifolia*, also figs (*Ficus*) e.g. banyans, and nine of 25 *Ficus* species (mean minimum diameter in range 5·4–15·5 mm) in study at Kerau, in Peninsular Malaysia. In Java, recorded as eating a variety of insects, including beetles (Coleoptera), bugs (Hemiptera, including homopterans), dragonflies and damselflies (Odonata) and termites (Isoptera); stomachs of specimens from Sumatra contained insects, including a cicada (Cicadidae). Usually forages singly, in pairs or in small groups; no groups that may exceed potential family size reported. Gathers at fruiting shrubs and trees in lower and middle storeys. Often joins (or forms nucleus of) roving mixed-species flocks, suggesting that animal prey is an important component of intake; of 38 individuals encountered in one study at Gombak, in Malaysia, 14 (37%) were attending flocks. Fruit probably harvested opportunistically while travelling with mixed flocks. Visits forest streams and pools to drink. Apparently maintains fairly limited feeding territories, but this yet to be investigated directly.
Breeding. Breeds Apr–Jul in N Thailand, Jan–Jul in Peninsular Malaysia, in almost all months in W & C Java, and Apr–Jun in Philippines. Nest a standard cup-shaped structure placed in low vegetation; clutch usually 2 eggs. No other information.
Movements. Resident; appears unusually territorial for a bulbul.
Status and Conservation. Not globally threatened. Sometimes uncommon, but usually common to very common throughout much of range, including Greater Sundas (Sumatra, Java, Borneo). Its tolerance of degraded and submontane habitats suggests that it is not at any immediate risk.
Bibliography. Becking (1989), Chasen & Hoogerwerf (1941), Collin & Hartert (1927), Danielsen & Heegaard (1995), Davison (1987, 1997a), Deignan (1945, 1956), Dickinson & Dekker (2002b), Dickinson, Dekker *et al.* (2002b), Dickinson, Kennedy & Parkes (1991), Duckworth & Kelsh (1998), duPont (1971), Fogden (1972), Gibson-Hill (1949), Gregory-Smith (1997a), Hellebrekers & Hoogerwerf (1967), Holmes (1996), Hoogerwerf (1949b), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lambert (1989b), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Mayr (1938), McClure (1967), Medway & Wells (1976), Mees (1996), Mitra & Sheldon (1993), Riley (1938), Robson (2000), Round & Brockelman (1998), Smythies (1957, 1986, 1999), Stresemann (1913), Ticehurst (1933), Tweeddale (1878a), Wells (2005), Wong (1985).

100. **Yellow-bellied Bulbul**

Alophoixus phaeocephalus

French: Bulbul à calotte grise **German**: Schwefelbülbül **Spanish**: Bulbul Capirotado
Other common names: Grey-headed (Bearded) Bulbul, Crestless White-throated Bulbul

Taxonomy. *Ixos* (*Trichixos*, Less.) *phaeocephalus* Hartlaub, 1844, Melaka, Peninsular Malaysia.
Genus often merged with *Criniger*; recent molecular evidence, however, strongly supports the view that the relationship between the two is remote, despite close similarity in appearance. DNA analysis suggests that present species is not close to other members of genus, and that it should possibly be separated in a monotypic genus. Delimitation of races in Borneo complex, variation appearing clinal, and perhaps only extremes worthy of recognition; listed ranges indicate evident ranges where known, but species probably present throughout; further study required. Three putative races (*caniceps*, *rufocaudatus*, *cantori*) merged with nominate; *medius* (described from Long Petah, in E Borneo) considered indistinguishable from *sulphuratus*. Four subspecies recognized.
Subspecies and Distribution.
A. p. phaeocephalus (Hartlaub, 1844) – extreme S Myanmar (extreme S Tenasserim), S Thailand, Peninsular Malaysia, and Sumatra (including Bangka, Belitung, Siberut and Sipura).
A. p. connectens Chasen & Kloss, 1929 – NE Borneo.
A. p. sulphuratus (Bonaparte, 1850) – C Borneo (E Sarawak and W Sabah S to SE Kalimantan).
A. p. diardi (Finsch, 1867) – W Borneo (S from R Baram).



Descriptive notes. 20–20·5 cm; 23–38 g. Large, brightly coloured, relatively retiring bulbul, eyes contrasting sharply with pale face, elongated chin and throat often puffed out and sharply demarcated. Nominate race has lores whitish, rest of face to gape and ear-coverts pale blue-grey; cap to neck darker blue-grey, slaty feather bases showing (producing squamate appearance in fresh plumage); upperparts from mantle to rump dark brown-olive with greenish tinge; rear edge of rump, and long overlying back plumes, pale olive-yellow, uppertail-coverts chestnut; upperwing dark olive-brown with slight rufescent tinge, tertials and fringes of flight-feathers warm rufous-olive; tail uniformly chestnut-tinged olive; chin and throat white, sharply demarcated against grey of face; side of breast and upper margin of flanks olive-green with yellowish cast, rest of underparts bright canary-yellow; iris clear brown to rich red-brown; upper mandible dark horn, lower mandible and cutting edges of upper mandible blue-grey or pale plumbeous; legs pale fleshy brown or yellowish-pink. Sexes similar. Juvenile has iris light brown, culmen and tip of upper mandible horn-brown. Race *diardi* has conspicuous yellow tip of tail; *connectens* has buffy wash on throat, an almost complete breastband, and lacks yellow tail tip; *sulphuratus* appears to be a variable intermediate between previous two races. Voice. Calls with subdued harsh, slightly buzzy "whi'ee whi'ee whi'ee", or (presumably same) a rasping "cherrit-berrit", and variety of other grating notes, often given when scolding human observers. Sometimes a loud "chack", especially in flight.
Habitat. Broadleaf evergreen forest, well-developed secondary growth (having relatively closed canopy, and layered structure), mature or overgrown tree plantations adjacent to forest, also transition zone between forest and coastal vegetation. At Pasoh research forest, in Negeri Sembilan (Peninsular Malaysia), 60% more individuals trapped in mature forest than in 20-year regenerating habitat, suggesting preference for former. Also enters peatswamp-forest and kerangas forest, and sometimes seems to prefer these habitats; of four members of genus at Gunung Mulu National Park, in Borneo (Sarawak), this was the only one to thrive in peatswamp-forest. Lowlands to 1000 m; not recorded above 760 m in Peninsular Malaysia.
Food and Feeding. A generalist, eating both fruit and insects. At Kerau, in Peninsular Malaysia, parties visiting fig (*Ficus*) crops took fruit of eleven of 25 fig species (in fruit-diameter range 5·4–15·5 mm); even while in these trees, however, tended to take more insects than fruit, and may have stopped off only while moving through. Less accessible fruit, e.g. berries of *Vitex pubescens*, taken by snatching during brief hovers. Individuals noted as catching bright green beetles (Coleoptera), but major insect component of diet unstudied. Usually encountered singly, in pairs, or in small parties of 3–4 (rarely five) individuals; rarely, if ever, in groups of 6–10 (unlike several congeners). Joins other bulbuls at fruiting shrubs; accompanies mixed-species flocks of insectivores, mostly other members of genus and various babblers (Timaliidae), in understorey. Frequents lower storey, generally lower down than most congeners. Regularly drops from lower branches to the ground, but usually returns to a perch within few seconds.
Breeding. Breeds Apr–Aug. Rate of retrapping in lowland forest in Peninsular Malaysia suggests that pair probably territorial. Clutch 2 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally fairly common to common throughout much of range. Extinct in Singapore for at least five decades, following deforestation. In mature lowland-forest understorey at Pasoh, in Negeri Sembilan (Peninsular Malaysia), long-term mist-netting showed this to be the second most frequently caught resident passerine, after Short-tailed Babbler (*Malacocincla malacensis*); at least 20–23 individuals made regular use of the 15-ha study plot during two successive breeding seasons, suggesting high population density. Given this abundance in relatively small patches of forest, and the species' use of submontane forest on slopes, this pycnonotid is unlikely to become at risk in immediate future.
Bibliography. Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), Davison (1987), Davison & Chew Yen Fook (1996), Dickinson *et al.* (2002b), Duckworth & Kelsh (1998), Eyton (1845), Fogden (1972), Ford & Davison (1995), Gibson-Hill (1949), Gregory-Smith (1997a), Holmes (1994), Horsfield & Moore (1854), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Kloss (1930), Lafresnaye (1845), Lambert (1989b, 1992), Lekagul & Round (1991), Lim Kim Seng (1992), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Mayr (1938), Medway & Wells (1976), Mees (1986), Nash & Nash (1988), Riley (1938), Robson (2000), Smythies (1957, 1986, 1999), Vowles & Vowles (1997), Wells (2005), Wells *et al.* (1978), Wong (1985).

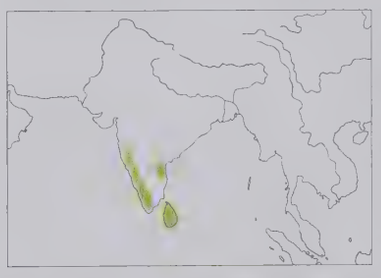
Genus *ACRITILLAS* Oberholser, 1905

101. **Yellow-browed Bulbul**

Acritillas indica

French: Bulbul à sourcils d'or **German**: Goldbrauenbülbül **Spanish**: Bulbul Cejiamarillo
Other common names: Golden-browed Bulbul

Taxonomy. *T[richophorus]. Indicus* Jerdon, 1839, Nilgiri District, India.
Sometimes placed in genus *Hypsipetes* or *Iole*, but unique morphology and nest structure support treatment in monotypic genus. Races poorly differentiated, thought possibly to be based on age-related differences, and species sometimes considered monotypic; thorough review is necessary. Putative race *intensior* (from Kunjapani, in Tamil Nadu) considered indistinguishable from nominate, and synonymized with it. Three subspecies tentatively recognized.
Subspecies and Distribution.
A. i. icterica (Strickland, 1844) – Western Ghats (C Maharashtra S to Kerala) and Eastern Ghats (Andhra Pradesh and Tamil Nadu), in peninsular India.
A. i. indica (Jerdon, 1839) – SW India and Sri Lanka (except SW).
A. i. guglielmi (Ripley, 1946) – SW Sri Lanka.



Descriptive notes. 20 cm; 27–34 g. A trim, brightly coloured bulbul with prominent large dark eyes, slightly decurved bill. Nominate race has brow, orbital region, face and throat bright pure yellow, ear-coverts olive-green with some yellow streaking; crown and upperparts olive-green with bronzy tinge, slightly brighter green on wings and tail; inner webs of flight-feathers brown (yellow at base), inner webs of rectrices yellowish; wholly yellow below, creating distinct two-tone appearance; iris light reddish or dark red (Sri Lanka); bill black; legs black, slaty or bluish-grey. Female is apparently slightly duller than male, and duskier on face. Juvenile is duller and more olive-yellow than adult, cheeks faintly barred brownish and flanks more dusky, chin, throat and belly yellowish-white, breast greyish-yellow; wings and mantle infused with rufescent tinge. Race *icterica* is allegedly paler, duller, less yellowish on upperparts and side of head than nominate; *guglielmi* is greener overall than previous, less bronzy yellow on upperparts, yellow underparts tinged with green (rather than bronzy-tinged bright yellow). Voice. Cheery, varied, and near-continuous whistles. Songs include brief, bright, loud, rollicking warble of unslurred ringing notes of variable form, sometimes ending distinctly higher with a few chiming notes, sometimes including a few dry purring trills. Calls include clear, sweet, querying "wheep", often doubled, and sometimes almost disyllabic ("t-wheep"); also frequently gives less inflected, more subdued, nasal version, "nyek-nyek", and less often a harsh jarring "chaink chaink" in alarm.
Habitat. Sholas, evergreen forest edge, secondary forest, shade coffee plantations, undergrowth and occasionally gardens, tending to be confined to more humid areas. In parts of Sri Lanka (Uva) tolerates highly degraded habitat, occurring in small patches of low forest along streams in otherwise cultivated country. Low hills to 2000 m (optimum c. 1000–1500 m), sometimes down to near sea-level.

Food and Feeding. Mostly fruit and seeds; also many invertebrates, including spiders (Araneae) and variety of winged insects. Noted as eating flowers and flower buds of *Apama siliquosa* and *Cullenia exarillata*. Rather unobtrusive and retiring. Travels in pairs and small flocks in lower and middle storeys; monospecific flocks of up to 60 individuals reported in Sri Lanka. Often accompanies mixed-species flocks, regularly forming their nucleus. Winged insects usually taken from lateral branches and in tops of saplings, or snatched in short fluttering aerial sallies. Fruit and seeds often plucked in brief hovering flights.
Breeding. Breeds chiefly Jan–May, sometimes extending to Sept; mostly Apr–May in Sri Lanka. The fact that small parties are sometimes accompanied by young suggests possibility of some form of co-operative breeding. Nest made of grass, dead leaves and moss, bound with cobweb and lined with rootlets; some were outwardly composed of rope-like fibre, and bound in spider webs and the silk of weaver ants (*Oecophylla smaragdina*), incorporating some dead leaves as camouflage, and lined internally with pieces of fine grass; often as flimsy hammock slung in horizontal fork (usually 1·5–4·5 m up) in sapling or shrub, at other times lodged in upright fork as nests of most pycnonotids, often poorly concealed. Clutch 2–3 eggs; no information on incubation and nestling periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Often common or very common throughout Western Ghats and Sri Lanka, wherever suitable wooded habitat exists. Fairly common as far N as Mahabaleshwar; abundant in Goa, where described as "by far the most common bird" in foothill forests. Rare in Eastern Ghats, but recently recorded N to Nalamalla Hills. Tolerates wide variety of forest types, and therefore seems unlikely to become threatened. Occurs in a range of protected areas, including Silent Valley and Periyar National Parks, in India, and Hakgala Strict Nature Reserve and Peak Wilderness Sanctuary, in Sri Lanka.
Bibliography. Ali (1969), Ali & Ripley (1996), Barnes (1889), Betham (1903), Betts (1931), Butler, A.L. (1896), Butler, E.A. (1881), Davison (1883), Dickinson *et al.* (2002b), Fairbank (1877), Ferguson & Bourdillon (1903–1904), Grimmett *et al.* (1998), Harrison (1999), Henry (1998a), Hume (1876b), Jayson & Matthew (2000), Jones *et al.* (1998), Karthikeyan (1997), Koelz (1939), Lainer (1999), Legge (1983), Lewis (1898), Pande (2003), Ranawana & Bambaradeniya (1998), Rasmussen & Anderton (2005), Ripley (1982), Robertson & Jackson (1992), Santharam (1997), Srinavasulu & Rao (2000), Zacharias & Gaston (1993, 1999).

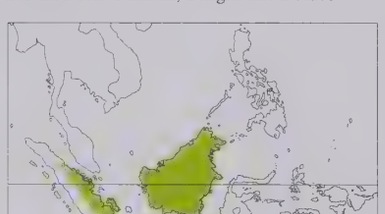
Genus *SETORNIS* Lesson, 1839

102. **Hook-billed Bulbul**

Setornis criniger

French: Bulbul à long bec **German**: Langschnabelbülbül **Spanish**: Bulbul Piquilargo
Other common names: Long-billed Bulbul(!)

Taxonomy. *Setornis criniger* Lesson, 1839, Sumatra.
Monotypic.
Distribution. Sumatra, Bangka and Borneo.



Descriptive notes. 20 cm. Chunky, crestless, relatively unobtrusive bulbul with distinctive face pattern, strong and distinctly hooked long bill, long, slightly rounded tail. Has whitish supercilium, black eyestripe and malar stripe, pale grey-brown ear-coverts; rich brown above, darkest on crown, tail and wings; very long hair-like feathers protrude from nape; tail conspicuously tipped white on inner webs of outer feathers; chin, throat and underparts white, washed buffy on mid-belly and distinctly solid grey on flanks; iris dark brown; bill black; legs black. Sexes alike. Juvenile undescribed. VOICE. Harsh "carrrk" reported; also harsh, but not loud, "chow, cho, cho". Often quiet, but family groups in S Kalimantan (Borneo) were "noisy and frequently heard".
Habitat. Generally considered a specialist of stunted forest types, such as kerangas or peatswamp. In Borneo, also found (at least in C Kalimantan) in lowland dipterocarp forest and (elsewhere) in abandoned rubber (*Hevea*) plantations; near Gunung Mulu, occupies ecotones between *Shorea albida* forest and peatswamp or kerangas. Lowlands; in Borneo, occurs close to coast in Sarawak and Kalimantan, with occasional records in Kalimantan up to 1000 m in stunted ridgetop forest; unconfirmed report from 1500 m.
Food and Feeding. Fruit, including small pulpy berries. Also reported as feeding on small beetles (Coleoptera), dragonflies and their nymphs (Odonata), ants (Hymenoptera) and spiders (Araneae); bill design, somewhat like that of an antshrike (Thamnophilidae) suggests high quantity of invertebrates in diet. Generally found in pairs or in small parties; up to seven seen together. Forages in middle storey and lower growth; snatches prey items from cobwebs.
Breeding. In Borneo, individual carrying food in Aug (Sarawak) and newly fledged young trapped in May (S Kalimantan). Display seen in Sept, involved bird lowering its head and shivering its outstretched wings. No other information.
Movements. Resident.
Status and Conservation. VULNERABLE. Locally fairly common in Borneo, but scarce in Sumatra; patchily distributed throughout. Massive rates of deforestation and forest fires have reduced total area of peatswamp and kerangas which make up this species' favoured habitat. In Borneo, it is fairly common in Tanjung Puting National Park (Kalimantan), but generally scarce in most protected areas, including Danum Valley (Sabah), Gunung Mulu and Similajau National Parks (Sarawak), and Gunung Palung National Park (Kalimantan). Continued protection of all reserves in which it is present is essential, as is a higher profile for the conservation of peatswamp-forest and kerangas forests in the Sundaic region. Given the paucity of distributional information relating to this species, further surveys should attempt to clarify its status and distribution in more remote regions of Sumatra and Borneo.
Bibliography. Butchart & Stattersfield (2004), Collar *et al.* (2001), Dickinson *et al.* (2002b), Duckworth & Kelsh (1998), Duckworth *et al.* (1996), Dutson (1990), Dutson *et al.* (1991), Holmes (1996), Hose (1893), Laman *et al.* (1996), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Mees (1986), Nash & Nash (1988), Pfeffer (1960–1961), Sheldon (1987), Smythies (1957, 1999), Stattersfield & Capper (2000), Vowles & Vowles (1997), Wilkinson, Dutson & Sheldon (1991), Wilkinson, Dutson, Sheldon *et al.* (1991).

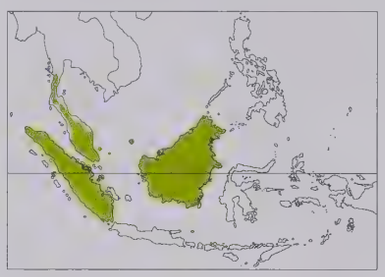
Genus *TRICHOLESTES* Salvadori, 1874

103. **Hairy-backed Bulbul**

Tricholestes criniger

French: Bulbul chevelu **German**: Borstenmantelbülbül **Spanish**: Bulbul Peludo

Taxonomy. *Br[achypodius]*. ? *criniger* Blyth, 1845, Melaka, Peninsular Malaysia.
Often placed in an expanded genus *Hypsipetes*, but unique features favour placement in monotypic genus. Substantial overlap in characters among all three races suggests that treatment as a variable monotypic species may be better; full review required. Described races *minutus*, *xanthogenys* and *fulvicauda* are synonyms of nominate. Three subspecies recognized.
Subspecies and Distribution.
T. c. criniger (Blyth, 1845) – extreme S Myanmar (Tenasserim S of 11°30' N), S Thailand (S of 13° N), Peninsular Malaysia (including Tioman Is) and E Sumatra.
T. c. sericeus Robinson & Kloss, 1924 – W Sumatra (including Musala I and Batu Is) and Lingga Archipelago.
T. c. viridis (Bonaparte, 1854) – Borneo and N Natuna Is.



Descriptive notes. 16–17 cm; 12–21 g. Small, unassuming, relatively quiet bulbul, olive above, yellowish below, with slightly rounded tail, strong rictal bristles, small and weak legs and feet. Has distinctive pale yellowish lores and broad area surrounding eye; ear-coverts pale dull yellow, longest feathers becoming brownish-olive at tips; feathering at base of lower mandible and under ear-coverts mixed with greyish-white and pale yellow, sometimes more distinctly greyish; cap and neck dark rufescent olive-brown, mantle to rump olive-brown, hair-like filoplumes (up to 50 mm long) extend from nape and mantle over back (rarely visible in field); uppertail-coverts olive-rufous, clearly demarcated; upperwings olive-rufous, especially rufescent on tertials, inner secondaries and outer margin of primaries; tail bright rufous-brown, tips of lateral rectrices creamy white (showing as distinct pale tips from below); chin and throat creamy white (greyish feather bases showing through faintly), merging into yellow of mid-breast; breast side pale grey, mottled dirty greyish-olive, or vague mottling across whole breast; upper flanks olive, lower flanks and belly to undertail-coverts yellow; iris dark brown or pale umber; bill light blue-grey, culmen ridge and tip of upper mandible black or horn-brown (difference possibly age-related); legs pale greenish-brown or fleshy brown, claws horn-brown. Sexes alike, female on average smaller than male than male. Juvenile has iris grey to grey-brown, legs, feet and claws pale fleshy pink. Race *sericeus* is larger than nominate, with duller yellow undertail-coverts; *viridis* is similar, but brighter on upperparts. VOICE. Presumed song a series of scratchy, chattering, warbled phrases interspersed with quavering "whirrrh"; in Peninsular Malaysia, same song described as a quiet, stuttering little phrase, "tutti tulip tikker tu". Also utters long, fairly high-pitched, soft, husky, rising whistle, "whiiiii" or "chui-i", repeated at fairly long intervals; sharp, chattering scolds, including "pree-chu, preeu-chu" and "pree-chuchu", given by flock when mobbing human observer.
Habitat. Evergreen forests, either mature or regenerated back to a more or less closed-canopy condition; also peatswamp-forest and well-structured secondary forest, sometimes where bamboo dominates. From lowlands to 1000 m.
Food and Feeding. A generalist, feeding on fruit and arthropods. Animal items include caterpillars, beetles (Coleoptera), small orthopterans and mantids; apparently takes greater amount of insects than do most bulbuls. At Kerau, in Peninsular Malaysia, small parties visited five of 25 *Ficus* species studied, taking mainly insects attracted to the crop but also some of the fruit (in mean small-diameter range 5·4–11·6 mm). In Borneo, seen to eat berries of *Macaranga* and *Trema orientalis*. Usually encountered in lower storey or middle storey of forest, sometimes singly, more often as pairs; occasionally a small (potentially family-sized) group, with no record of more than five individuals together. Frequently joins mixed-species foraging flocks; in one study at Gombak (Peninsular Malaysia), more than half (68%) of all individuals observed were attending such flocks. Generally hunts more like a babbler (Timaliidae) than a bulbul, actively inspecting foliage and branches for arthropods. Takes small caterpillars and arthropods from foliage; flying insects caught on the wing during agile sallies. Never descends to ground. At Kerau, most fruit was cropped from perches, some in fly-past snatches; foragers showed morning and evening peaks of activity. Seems more than usually inquisitive; often approaches or follows human observers, sometimes mobbing them.
Breeding. Season Feb–Aug. No other information.
Movements. Resident. Long-term mist-netting in Selangor and Negeri Sembilan (Peninsular Malaysia) revealed altitudinal difference in rates of retrapping of marked individuals (24% in slope forests; 40–46% in lowland forests), implying higher density/proportion of sedentary individuals in lowlands. At Pasoh (Peninsular Malaysia), this was one of few species showing no significant difference in totals handled and retrapping rates between equivalent-sized (15–17 ha) plots of mature versus 20-year-old regenerating forest, but during breeding seasons almost twice as many individuals made repeated to regular use of regenerating plot. Repeated recapture within and between breeding seasons implies faithfulness to fixed activity space, suggesting that this is defended as a territory (but active territoriality not confirmed). Some local movements occur: in Selangor (Peninsular Malaysia), two ringed birds moved 3–5 km between captures, one of them in the space of 24 hours.
Status and Conservation. Not globally threatened. Generally common. Occurs in a range of mature forest types, and able to withstand fairly drastic fragmentation of habitat. This resilience, and the species' use of submontane slopes, suggest no immediate threat to its survival. Ongoing catastrophic clearance of lowland Sundaic forests, however, implies that overall numbers have declined dramatically, and this situation requires monitoring. Occurs in a range of protected areas, including Taman Negara National Park, in Peninsular Malaysia. An apparently isolated population at N limit of its range falls within Kaeng Krachan National Park, in Thailand.
Bibliography. Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), Davison (1987), Davison & Chew Yen Fook (1996), Dickinson *et al.* (2002b), Duckworth & Kelsh (1998), Fogden (1972), Ford & Davison (1995), Gibson-Hill (1949), Gregory-Smith (1997b), Holmes (1996), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lambert (1986, 1989b, 1992), Lekagul & Round (1991), Lim Kim Seng (1994b), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Mayr (1938), McClure (1967), Medway & Wells (1976), Nash & Nash (1988), Prentice & Aikanathan (1989), Rajathurai (1996), Riley (1938), Robson (2000), Round & Brockelman (1998), Smythies (1957, 1986, 1999), Thompson (1966), Vowles & Vowles (1997), Wells (1990a, 2005).

PLATE 23 ➤


ssp virescens
ssp myitkyinensis
104
ssp propinqua
105
106
PLATE 23
inches 4
cm 10
ssp cinnamomeoventris
107
variants
108
ssp mcclellandii
ssp tickelli
109
110
ssp similis
ssp canescens
ssp virescens
111
ssp philippinus
112
ssp sumatranus
ssp mindorensis
ssp siquijorensis
114
113
ssp everetti
ssp catarmanensis
115
ssp cinereiceps

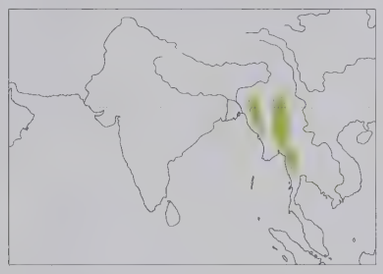
Genus *IOLE* Blyth 1844

104. Olive Bulbul

Iole virescens

French: Bulbul olive **German**: Burmabülbül **Spanish**: Bulbul Verdoso
Other common names: Blyth's Olive/Viridescent Bulbul

Taxonomy. *I[ole]. virescens* Blyth, 1845, Arakan, Myanmar.
Often placed in expanded genus *Hypsipetes*; when thus treated, current species name invalid, as preoccupied, and replaced by new name *viridescens*. Taxonomic status, morphological characters and vocalizations of populations in NE India and Myanmar uncertain or confusing, and possibly more than one species involved; birds in Bangladesh apparently belong to race *cacharensis*, but further study needed. Three subspecies recognized.
Subspecies and Distribution.
I. v. cacharensis (Deignan, 1948) – NE India (S Assam hills, extreme W Manipur, and Meghalaya) and SE Bangladesh (Chittagong).
I. v. myitkyinensis (Deignan, 1948) – W & E Myanmar.
I. v. virescens Blyth, 1845 – SW & S Myanmar (including Arakan) and SW Thailand.



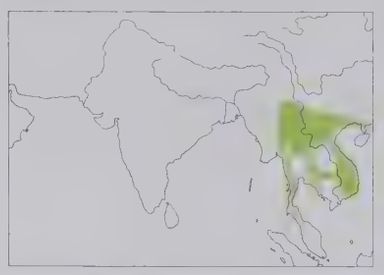
Descriptive notes. 19 cm. A small, drab bulbul. Nominate race has side of head yellowish-olive; ear-coverts generally appear paler than crown; crown and upperparts strongly tinged olive, underparts unstreaked olive-yellow; iris reddish, brownish or greyish-pink (whitish-grey to grey eyes reported from W Myanmar); upper mandible brownish-horn, lower mandible paler (slightly bluish around gape); legs brownish-pink. Distinguished from very similar *I. propinqua* mainly by more olive tone above, stronger yellow tinge below, darker eyes. Sexes alike. Juvenile is rustier on upperparts (including wing and tail), with paler undertail-coverts. Race *cacharensis* is smaller and nearly uniform bronzy olive above, duller olive below with bright yellow on central throat and belly, slight cinnamon tinge on undertail-coverts, birds from Chittagong (apparently this race) have rufescent crown (slightly crested) and tail, somewhat paler and greyer face and underparts, yellowish throat and centre of belly, vent tinged buff; *myitkyinensis* has reduced yellow on underparts (possibly morphologically indistinguishable from some *I. propinqua*). Voice. In Thailand (nominate race), a common call, given fairly persistently, is strongly upslurred, strident, mewing "whee-ík", similar to that of *I. olivacea*, less nasal than primary call of *I. propinqua*; voice of *cacharensis* and *myitkyinensis* undocumented.
Habitat. Moist broadleaf evergreen forest, semi-evergreen forest and tall secondary growth (e.g. in abandoned cultivation), often with dense shrub layer or dense growth of vines. In Meghalaya, in India, reported to occur (at least historically) in well-wooded ravines. Lowlands to 1000 m, most often in foothills.
Food and Feeding. Feeds mainly on berries, sometimes insects. Usually in pairs or small (family?) parties; reports of flocks of over 100 individuals require verification. Forages in middle storey, tops of trees, and high bushes; tends to be rather shy and unobtrusive.
Breeding. Feb–Sept, mainly Mar–Jun, varying locally. Only information on nest is from old records from N India (identification possibly suspect); compact and cup-shaped structure, built with strips of inner bark, scraps of outer bark and fine twigs, lined with black fern roots and long fibres, usually a few dead leaves attached to outside with cobwebs, suspended between horizontal twigs or in vertical fork c. 1·5 m up, and poorly concealed, in bush or low tree inside dense forest. Clutch apparently 3 eggs. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Mostly very local, but probably overlooked. In India, apparently rare in Khasi Hills and Garo Hills of Meghalaya, mostly at their fringes; very local in Manipur according to historical literature, but "rather common" in the "Jhiri level". In Bangladesh, evidently common on basis of old specimen records from Chittagong, but scarce in Sylhet. Generally poorly known in Myanmar; occurs in Chindwin Valley, first record for upper Chindwin (near Kalewa) in 1995. In Thailand confined to W forests, where locally fairly common.
Bibliography. Ali & Ripley (1996), Bingham (1903), Deignan (1948a), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Gregory (2000), Grimmett *et al.* (1998), Harvey (1990), Hume (1888), Hume & Davison (1878), Lekagul & Round (1991), Mears & Oates (1907), Ripley (1982), Rippon (1901), Robson (1995, 2000), Smythies (1986), Stuart Baker (1892–1893, 1922–1930), Ticehurst (1933).

105. Grey-eyed Bulbul

Iole propinqua

French: Bulbul aux yeux gris **German**: Grauaugenbülbül **Spanish**: Bulbul Ojigrís

Taxonomy. *Criniger propinquus* Oustalet, 1903, Pa Mou, Tonkin, north Vietnam.
Often placed in expanded genus *Hypsipetes*. All races are extremely similar and probably represent points on steep clines; subspecific allocation probably requires simplification, and full review is necessary. Proposed race *lönnbergi* (described from Pang Huai Hom and Khao Phlung, in Thailand) is a synonym of nominate. Six subspecies currently recognized.
Subspecies and Distribution.
I. p. propinqua (Oustalet, 1903) – S China (S Yunnan), E Myanmar, N Thailand and N Laos.
I. p. aquilonis (Deignan, 1948) – N Vietnam and S China (S Guangxi).
I. p. simulator (Deignan, 1948) – SE Thailand, Cambodia, S Laos and S Vietnam (S Annam).
I. p. innectens (Deignan, 1948) – S Vietnam (Cochinchina).
I. p. lekhakuni (Deignan, 1954) – S Myanmar (N Tenasserim) and W Thailand (including Kanchanaburi).
I. p. cinnamomeoventris Stuart Baker, 1917 – S Myanmar (S Tenasserim), peninsular Thailand and extreme N Peninsular Malaysia.



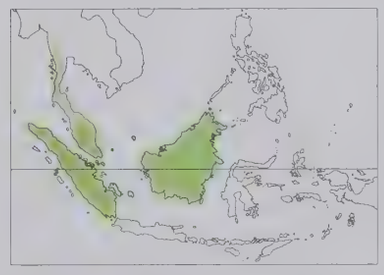
Descriptive notes. 17–19 cm; 26 g. Relatively slim, dull, small-headed bulbul crown feathers often raised in slightly frizzy crest. Nominate race has crown to hindneck dull olive-rufous, lores to above eye, upper face and ear-coverts smoky grey; mantle to rump olive-brown, uppertail-coverts dark rufous-brown; upperwing olive-brown, fringed brighter olive on outer secondaries and primaries, slight bronzy sheen on tertials and inner secondaries; tail uniform dark rufous-brown; chin and throat dull white, feathers slightly elongated; mid-breast off-white with dirty yellowish fringing, breast side and flanks ashy olive-brown (forming distinct patch); belly cream, tinged olive-brown, undertail-coverts uniform tawny-brown (tone and pattern slightly variable); iris clear grey to white, contrasting blackish eyelid rim; upper mandible blackish-brown, lower mandible pale bluish-grey; legs fleshy brown to purplish-brown. Sexes alike. Juvenile is generally duller than adult, with light brown iris. Race *aquilonis* is yellower below (particularly mid-belly) than nominate, thus more similar to race *myitkyinensis* of *I. virescens* (ranges do not overlap); *simulator* is less green above and much less yellow below (best distinguished from similar *I. olivacea* by more rufescent undertail-coverts, more olive wings, yellowish-tinged underparts, greyer supercilium); *innectens* has relatively dark olive-green upperparts; *lekhakuni* differs from nominate in brownish-olive (not olive-green) upperparts, greyer underparts; *cinnamomeoventris* lacks yellow tones below, these replaced by buffy clay-coloured suffusion strongest on undertail-coverts. Voice. No complex song described. Distinctive loud, flat, very nasal "uuu-wit" or "berret", second note stressed but not upwardly inflected; in Cochinchina (race *innectens*) a slightly different "whii-it" and flatter "wowh", or "weeao"; in S Thailand (*cinnamomeoventris*) a much less nasal "prrrit". Also gives occasional soft whistled note. Less noisy than *Alophoixus* species.
Habitat. Broadleaf evergreen and mixed deciduous forest and edges; also tolerates (or even prefers) secondary forest and disturbed vegetation, often with major bamboo or vine component, especially around clearings and along roads, tracks and rivers through forest. Lowlands to 1000 m, rarely to 1500 m.
Food and Feeding. No detailed information on diet; mainly fruit and insects. Usually solitary or in pairs, but sometimes in groups at fruiting shrubs and trees. Forages in canopy and middle storey; not descending to ground. Relatively shy and unobtrusive.
Breeding. Apr in N Thailand. No other information.
Movements. Apparently resident.
Status and Conservation. Not globally threatened. Locally fairly common, but probably often overlooked owing to identification problems. Apparently scarce in S Thailand; probably not common in S China. Considering its ability to survive in highly degraded or regenerating habitats, it is probably generally secure.
Bibliography. Cheng Tsohsin (1987), Daltry & Momberg (2000), Deignan (1945, 1948a), Dickinson & Dekker (2002b), Duckworth & Hedges (1998), Duckworth, Salter & Khounboline (1999), Gyldenstolpe (1913, 1916), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Medway & Wells (1976), Meyer de Schauensee (1984), Riley (1938), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1993a, 1993b), Smythies (1986), Stanford & Mayr (1940–1941), Stepanyan (1995), Strange (2002), Thewlis *et al.* (1996), Wells (2005).

106. Buff-vented Bulbul

Iole olivacea

French: Bulbul de Charlotte **German**: Braunbauchbülbül **Spanish**: Bulbul Oliváceo
Other common names: Dull-brown Bulbul; Charlotte's/Finsch's Bulbul (*charlottae*)

Taxonomy. *I[ole]. olivacea* Blyth, 1844, Singapore.
Often included in a broad genus *Hypsipetes*; when thus treated, current species name becomes invalid, as preoccupied, and name *cryptus* should be used, in addition to which *charlottae* then has priority as the species name. Proposed race *perplexa* (from Labuan Kelambu, in Borneo) invalid, as described from a standard juvenile specimen. Two subspecies recognized.
Subspecies and Distribution.
I. o. olivacea Blyth, 1844 – S Myanmar (Tenasserim), S Thailand (S of 14° N), Peninsular Malaysia, Riau Archipelago and Sumatra (including Batu Is, Bangka and Belitung).
I. o. charlottae (Finsch, 1867) – Anambas Is (E of Peninsular Malaysia), N Natunas and Borneo (including Banggi I).



Descriptive notes. 20–20·5 cm; 20–28 g. A medium-sized, virtually featureless, noisy bulbul with relatively long and slender bill, crown often appearing frizzy when feathers slightly raised. Cap is dark rufescent olive-brown, lores, eyering and upper face smoky grey, shading to ashy brown on ear-coverts; upperparts dull olive-brown, uppertail-coverts dark rufous-brown; upperwing olive-brown, brighter rufous-olive fringing on outer webs of outer secondaries and primaries, slight bronzy sheen on tertials and inner secondaries; tail uniform dark rufous-brown; chin and throat dull white, centre of breast as throat, breast side and flanks ashy olive-brown (forming distinct patch); belly pale cream, undertail-coverts the same but with feather centres ashy brown; iris greyish-white; upper mandible dark pinkish-horn, lower mandible pale grey and fading to pale pinkish towards base; legs yellowish to pinkish-brown. Distinguished from very similar *I. propinqua* mainly by purer grey face contrasting more with dark cap and, especially, brow, less olive wings, less yellow-tinged underparts, no ru-

On following pages: 107. Sulphur-bellied Bulbul (*Ixos palawanensis*); 108. Nicobar Bulbul (*Ixos nicobariensis*); 109. Mountain Bulbul (*Ixos mcclellandii*); 110. Streaked Bulbul (*Ixos malaccensis*); 111. Sunda Bulbul (*Ixos virescens*); 112. Philippine Bulbul (*Ixos philippinus*); 113. Zamboanga Bulbul (*Ixos rufigularis*); 114. Streak-breasted Bulbul (*Ixos siquijorensis*); 115. Yellowish Bulbul (*Ixos everetti*).

fous tinge on undertail-coverts, also by larger bill. Sexes alike. Juvenile is similar to adult but with bill pale, pale margins on wing-coverts and secondaries, light brown eyes. Race *charlottae* is very like nominate, but upperparts darker olivaceous brown, underparts with slightly more brownish, or olivaceous, tinge. VOICE. No complex song described. Call a musical "er-whit" or "wher-it", with sharper, more metallic second note, similar to that of *I. virescens*, thinner, higher-pitched and less nasal than that of *I. propinqua*. Also gives flatter "whirr". Commonest call rendered "cherrit", "chewit", "bueik" or "whe-ic", approaches that of *I. propinqua* but richer, slightly more sustained, with small but noticeable upward inflection, and sometimes given in a short series interspersed with occasional shrill whistling notes.
Habitat. Broadleaf evergreen forest, edges and secondary growth. At Pasoh, in Peninsular Malaysia, no difference in catch-rates between mature forest and 20-year-old regenerated plots. Enters older *Albizia* plantations and peatswamp-forest. Perhaps most frequently encountered at forest edges and along broad roads and tracks through forest, particularly in areas covered with new growth of gap-colonizing trees (e.g. *Macaranga*). Lowlands to 900 m.
Food and Feeding. A generalist, eating fruit and insects. Fruit part of diet includes many figs (*Ficus*), including banyans, and 17 of 25 *Ficus* species studied at Kerau (Peninsular Malaysia) in mean fruit-diameter range 5·4–27·4 mm. Eats fruit and berries (e.g. *Trema orientalis* and *Cissus*) in Borneo; stomachs of specimens from Sumatra contained peel and pips of fruit. Insects reported eaten include orthopterans and fly larvae (Diptera). Forages in interior canopy and middle storey, occasionally in understorey; sometimes descends lower at edges to feed in fruiting shrubs, but never descends to ground; in studies at Pasoh, in Peninsular Malaysia, appeared to spend most time above 3 m. Searches foliage for arthropods; chases flushed items in agile pursuit, and makes short flycatching sallies after passing insects. Distinct morning and evening peaks of foraging activity.
Breeding. On mainland, breeding in Apr–Jul in Peninsular Malaysia, and unconfirmed reports from Jan onwards; well-developed juveniles in Mar in Sumatra. Clutch 2 eggs; both pair-members tend fledglings. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Population probably declining, as lowland forest is disappearing from Sundaic lowlands. This species' tolerance of heavily degraded habitats, however, implies that it is not at immediate risk of extinction: indeed, it is at least as common in edge, disturbed and secondary forest as in mature forest, and hence among the bulbuls most likely to have benefited from selective logging. More comprehensive forest clearance is detrimental. Although previously resident in Singapore, it is now very scarce and irregular following deforestation.
Bibliography. Büttikofer (1887), Collar *et al.* (2001), Danielsen & Heegaard (1995), Davison (1987), Deignan (1948a), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Ford & Davison (1995), Gibson-Hill (1949), Hume & Davison (1878), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), Lim Kim Seng (1991, 1994b), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Medway & Wells (1976), Mees (1986), Mitra & Sheldon (1993), Oberholser (1917b), Rajathurai (1996), Riley (1938, 1939), Robson (2000), Smythies (1957, 1999), Stattersfield & Capper (2000), Thompson (1966), Voous (1961), Vowles & Vowles (1997), Wells (2005).

Genus *IXOS* Temminck, 1825

107. Sulphur-bellied Bulbul

Ixos palawanensis

French: Bulbul de Palawan **German**: Goldaugenbülbül **Spanish**: Bulbul de Palawan
Other common names: Golden-eyed/Olive Bulbul

Taxonomy. *Criniger palawanensis* Tweeddale, 1878, Puerto Princesa, Palawan, Philippines.
Sometimes included in genus *Hypsipetes*. Rather aberrant member of present genus, and possibly better separated in its own, monotypic genus; taxonomy merits further study. Monotypic.
Distribution. Palawan, in W Philippines.



Descriptive notes. 18 cm. Small olive-brown bulbul, lanceolate crown feathers forming slight crest. Crown and ear-coverts are olive-brown with narrow pale shaft streaks; upperparts dull olive-brown; wings and tail brown, pale olive fringing on upperside of flight-feathers and rectrices; throat yellowish-white with olive-yellow streaks, darkening on breast and flanks, where smudged with pale olive and greyish; lower breast, belly and undertail-coverts are primrose-yellow; iris yellowish; bill black above, grey on cutting edges and lower mandible; legs brown. Sexes alike. Juvenile undescribed. VOICE. Poorly known; variety of harsh simple calls, including "chirrup", "chirrup-chi" and "chip".
Habitat. Evergreen forest, edges and secondary growth in mountains.
Food and Feeding. Diet not documented; presumably fruit and insects. Found singly, in pairs or in small flocks.
Breeding. Birds with enlarged gonads in Apr. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Palawan EBA. Uncommon. Very poorly known species. Present in St Paul Subterranean River National Park.
Bibliography. Dickinson *et al.* (1991), duPont (1971), Gregory (2000), Inskipp *et al.* (1996), Kennedy *et al.* (2000), Sharpe (1888a), Stattersfield *et al.* (1998).

108. Nicobar Bulbul

Ixos nicobariensis

French: Bulbul des Nicobar **German**: Nikobarenbülbül **Spanish**: Bulbul de Nicobar

Taxonomy. *Hypsipetes nicobariensis* F. Moore, 1854, Nicobar Islands.
Originally named *Ixocincla virescens*; when placed in present genus or in expanded *Hypsipetes*, however, that specific epithet preoccupied. Placement in present genus, constituent members of which do not seem particularly closely related to each other, is open to debate; full review of genus required. Often included in an expanded *Hypsipetes*; on basis of superficial similarity, has been treated as race of *H. madagascariensis* (along with other Asian forms now grouped under *H. leucocephalus* and *H. ganeesa*). Detailed study required in order to clarify true affinities with members of the two genera. Monotypic.
Distribution. C Nicobar Is.



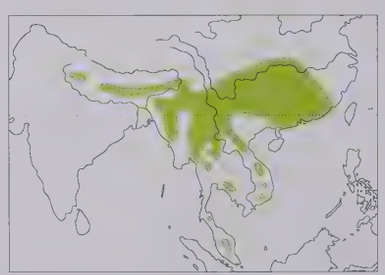
Descriptive notes. 20–22 cm. Plain, dull, olive bulbul with rather thick and long bill, slightly elongated crown feathers often raised into a crest. Crown is sooty brown or blackish-brown, contrasting with paler brown lores; nape to uppertail-coverts uniform olive-green, tinged brown (amount of brown or green varying individually); wings and tail slightly darker and browner; throat and breast dingy white, subtly tinged yellow (some with sufficient brown on breast to form indistinct breastband, and some much yellower below than others); yellow suffusion on lower underparts; iris brown; bill blackish, dusky yellow lower mandible and cutting edges of upper mandible; legs blackish-grey or dark greenish-brown. Sexes alike. Juvenile is browner above, with no contrast between head and mantle, paler bill than adult. VOICE. Chattering voice apparently recalling that of *Hypsipetes leucocephalus*; noisy, especially when flocking.
Habitat. Primarily forest; also at forest edges and in secondary growth, gardens and plantations, including coconut and rubber (*Hevea*).
Food and Feeding. No information on diet. Usually in pairs or in small parties of 5–6 individuals; loose aggregations of up to 100 sometimes gather in non-breeding season.
Breeding. Evidently breeds early in year, as very young birds found in Feb. No other information.
Movements. Resident.
Status and Conservation. VULNERABLE. Restricted-range species: present in Nicobar Islands EBA. Formerly common; now scarce, probably owing to a combination of factors including habitat destruction and introduced competitors. Natural habitat being lost as a result of conversion to coconut plantations, expansion of human settlements, and infrastructural development; seems to have been displaced from many of its former haunts by *Pycnonotus jocosus* (introduced from nearby Andaman Is). Tillanchong I (17 km²), uninhabited and protected as a reserve, provides some hope for the species, but conservation action should be focused on Katchall and Teressa, where the largest numbers have been seen. Recorded also on Bompoka, Camorta, Nancowry and Trinkut; old report from Pilu Milu, off Great Nicobar, considered dubious. Population control of *P. jocosus* should be considered at sites which are important for this present species.
Bibliography. Abdulali (1964, 1967), Ali & Ripley (1996), Ball (1873), Butchart & Stattersfield (2004), Butler (1899), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Dickinson *et al.* (2002b), Gregory (2000), Grimmett *et al.* (1998), Hume (1874), Richmond (1902), Ripley (1982), Sankaran (1997, 1998), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Tikader (1984).

109. Mountain Bulbul

Ixos mcclellandii

French: Bulbul de McClelland **German**: Grünflügelbülbül **Spanish**: Bulbul de McClelland
Other common names: Rufous-bellied/Green-winged/McClelland's Bulbul

Taxonomy. *Hypsipetes McClellandii* Horsfield, 1840, Assam, India.
Sometimes included in genus *Hypsipetes*. Specific name sometimes misspelt as *macclellandii*. Racial delimitation complex, and thorough review required. Some races may represent separate species, e.g. *canescens* is geographically isolated and does not fit the general pattern of plumage variation; others seem too poorly differentiated or variable to warrant taxonomic recognition. Detailed review of geographical song variation required. Described race *vargus* (from Nepal) appears indistinguishable from and is synonymized with nominate; *binghami* (Southern Shan States, in Myanmar) thought to be a colour morph of *tickelli*, and treated as a synonym of it. Nine subspecies provisionally recognized.
Subspecies and Distribution.
I. m. mcclellandii (Horsfield, 1840) – Nepal, N India (E Himalayas from Uttaranchal E to NE Arunachal, and hills from S Assam S to Mizoram) and NW Myanmar; reported also from SE Tibet.
I. m. ventralis Stresemann, 1940 – W & SW Myanmar (including Arakan); old reports from Bangladesh (Chittagong hills).
I. m. tickelli (Blyth, 1855) – E Myanmar and N Thailand.
I. m. similis (Rothschild, 1921) – S China (W & S Yunnan) and NE Myanmar S to N Indochina.
I. m. holtii (Swinhoe, 1861) – SE China (Guangxi, Jiangxi, Guangdong, Fujian).
I. m. loquax Deignan, 1940 – NW & NE Thailand and S Laos.
I. m. griseiventer (Robinson & Kloss, 1919) – S Vietnam (S Annam).
I. m. canescens Riley, 1933 – SE Thailand and SW Cambodia.
I. m. peracensis (Hartert & Butler, 1898) – S Thailand and N Peninsular Malaysia.



Descriptive notes. 21–24 cm; 27–41 g. Large, noisy, conspicuous bulbul with long slim bill, large square tail, generally bright olive above, with strong chestnut tone on underparts, elongated crown feathers frequently raised into a frizzy, expressive crest, elongated throat feathers often puffed out. Nominate race has crown deep chestnut-brown with fine white shafts (inconspicuous), lores dark ashy grey, rest of face slightly paler ashy grey, becoming ashy brown on forepart of ear-coverts; rear ear-coverts and side of neck light rufous-brown; upperparts bright olive-green, tertials and inner secondaries similar except outer webs edged even brighter; primaries and secondaries have sooty black inner webs, and bright, yellow-tinged olive-green outer webs (showing as conspicuous panel against duller coverts on closed wing); tail olive-green, a shade darker than upperwing-coverts, with shafts deep brown above, yellow-white below; chin and throat greyish with prominent white shaft streaks; breast strongly

tinged dull rusty, especially at side, with thin white shaft lines, upper flanks olive, belly creamy buff with ashy fringing, undertail-coverts yellowish; iris light reddish-brown to dark rich crimson, eyelids edged red; upper mandible dark horn-brown, lower mandible pale grey or pinkish-grey, sometimes darker at tip; legs pale pinkish-brown to light purplish-brown, soles chrome-yellow. Sexes alike. Juvenile is browner above, with duller, browner wings, has plain pale greyish throat, shorter, less shaggy crest, weaker streaking on crown and breast, cinnamon-tinged vent, plain brown or brownish-grey iris. Race *ventralis* has greener upperparts than nominate; *tickelli* has more greenish-olive mantle (sometimes brownish: "*binghami*"), breast duller, crown and crest feathers lanceolate and dull, dark brown with conspicuous pale shaft streaks; *similis* has mantle dull grey-brown, ear-coverts, neck and breast dull dark pinkish-chestnut, wings and tail bright olive-green, belly whitish, undertail-coverts yellowish; *holtii* has forehead light rufous with pale feather centres, crest feathers with pale tips as well as shaft streaks, mantle relatively dark olive-brown, breast ochraceous brown (less rufous), belly pale buff, wings and tail dull green, lower mandible mostly dark; *loquax* differs from previous in paler buffy underparts and buffy yellow undertail-coverts; *griseiventer* has dull brown head, greyish ear-coverts, greyish underparts with practically no fulvous wash on breast and flanks; *canescens* lacks olive and rufous tones, has much grey on underparts, duller and browner on mantle and crown (pale shaft streaks less obvious), with iris much duller, chestnut or orange-brown; *peracensis* has crown darker (lacking rufous), ear-coverts dingy grey, breast ashy brown, rest of underparts lacking rufous or yellow tinges. Voice. Song in India (nominate race) a repetitive, deliberately paced series of screechy, slightly alternating squawks, "chirrut, chewt, chirrut, chewt"; in China, *holtii* said to give a series of 4–5 loud descending notes. Calls (more frequently heard) distinctively high-pitched, metallic, downwardly inflected chirps, "tsiuc" or "chewp"; in Malaysia, include similar but rather feeble, piping "chiep-chiep, chiep", sharp "chio-chip" and penetrating "sneep sneep sneep". Sometimes gives more complex "tchi-chitu" and plaintive, soft, descending mew. Flocks emit call notes almost constantly.

Habitat. Canopy of broadleaf evergreen forest, oak (*Quercus*) forest, rhododendron forest and pine (*Pinus*) forest. Commonly ranges into more open, stunted or secondary habitats, such as edges and adjacent scattered bushes, young secondary growth, light gallery forest, fern tangles along roads, gardens, overgrown edges of old landslips, and elfin summit forest. Occurs at 800–2700 m; perhaps peak abundance at c. 1800–2100 m.

Food and Feeding. A generalist, eating fruit and insects, possibly also nectar. Eats many berries and other small fruits (e.g. *Ficus vasculosa* and *Lindera pipericarpa*); in Myanmar, seen to feed at fruit and flowers of *Heptapleurum*, *Ficus*, cherry, *Maesa*, *Litsea*, *Polygonum*, *Prunus*, *Berberis*, *Polygala*, rhododendrons. Insects taken include large moths (Lepidoptera). Visits flowers, but whether for nectar, for insects or to eat the flowers themselves is not entirely clear. Sometimes solitary, but usually in pairs or in loose, typically single-figure, foraging parties; pairs disperse in breeding season, but parties found more or less throughout year. Gathers at fruiting and flowering trees and shrubs, and commonly attends mixed-species foraging flocks. Found more in treetops than are most *Pycnonotus* species, but also drops to low fruiting bushes to feed. Fruits often plucked during hovering sally. Regularly sallies from prominent perches to catch insects in flight; also snatching trapped insects from spider webs. Sometimes shy, but often tame and sluggish.

Breeding. May–Aug in NE India, Feb–Aug in N Thailand and Mar–Sept in Peninsular Malaysia. Nest sometimes placed c. 6–13 m above ground, but often much lower down in undergrowth at forest edge, usually slung from the rim between thin twigs of horizontal fork near edge of tree or bush, or sometimes bamboo; one in Nepal (nominate race) was an oval cup, built of ferns, dry leaves, roots, grasses and a little moss, bound with fine black fibres, which also attached it to a slender fork, and those reported historically in India were described as bulky and untidy, with a cup of coarse grass, bamboo leaves, shreds of soft bark and other fibrous materials (no moss), inner lining of fine grass stems mixed with fern roots; one in Myanmar (*tickelli*) was rather different, a small, flimsy structure made of bamboo leaves, held together with moss and cobwebs, lined with fine grass, suspended 1 m above ground in fork of tall bracken, and another, in China (*holtii*), was surprisingly small and frail, suspended 1·5 m up in horizontal fork; a hammock-like nest in Malaysia (*peracensis*) was in low tangle of scrambling ferns on steep bank. Clutch 2–3 eggs, rarely 4; mo information on incubation and fledging periods; both pair-members tend nestlings and fledglings, feeding them with berries and insects.

Movements. Resident, subject to altitudinal movements. In India and Nepal, post-breeding descent to foothills, and occasionally out on to plains. In Cameron Highlands (Peninsular Malaysia), elevational shifts by marked individuals of up to 1000 m, over map distances of up to 1·6 km, were thought possibly to fit within normal (perhaps even diurnal) group foraging range. Race *similis* recorded as a vagrant on Hainan I.

Status and Conservation. Not globally threatened. Generally common throughout range. Fairly common or common in hills of NE India, Nepal, Bhutan, much of Myanmar, N Thailand and Laos; the commonest bulbul in forested uplands of Peninsular Malaysia. Scarce in SW Cambodia, where first recorded in 2000 (in Cardamom Mountains); rare or extinct in Bangladesh, possibly still occurs in Chittagong hills. The fact that it tolerates, or even prefers, disturbed or secondary vegetation and forest edges implies that it is not in any imminent danger. Despite its being a popular target of hunters in N Thailand, Laos and Vietnam, populations there seem not to have suffered.

Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Bingham (1903), Bingham & Thompson (1900), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Daltry & Momberg (2000), Davidson (1998), Deignan (1940b, 1945), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Duckworth, Salter & Khounboline (1999), Eames *et al.* (2002), Étchécopar & Hüe (1983), Gibson-Hill (1949), Grimmett *et al.* (1998), Harington (1909a), Harvey (1990), Hopwood (1912), Hopwood & Mackenzie (1917), Hume (1888), Hume & Davison (1878), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Jeyarajasingam (1990), Jeyarajasingam & Pearson (1999), King (1989), Koelz (1954), Lekagul & Round (1991), Lewthwaite (1996), MacKinnon & Phillipps (2000), Madoc (1976), McClure (1964), Medway (1972), Medway & Wells (1976), Meyer de Schauensee (1929, 1984), Pershouse (1916), Rasmussen & Anderton (2005), Riley (1938), Robson (2000), Scully (1879), Singh (1995), Smythies (1986), Stanford & Mayr (1940–1941), Stepanyan (1995), Stevens (1914–1915, 1923–1925), Stresemann & Heinrich (1939), Stuart Baker (1892–1893, 1922–1930), Tobias (1997c), Traylor (1967), Zheng Guangmei & Zhang Cizu (2002).

110. **Streaked Bulbul**

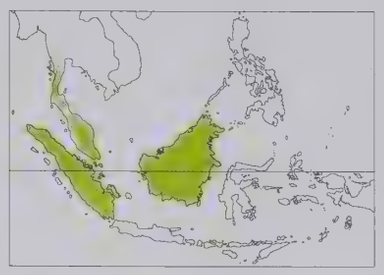
Ixos malaccensis

French: Bulbul malais **German**: Strichelbrustbülbül **Spanish**: Bulbul Malayo
Other common names: Green-backed Bulbul

Taxonomy. *H[ypsipetes]. malaccensis* Blyth, 1845, Melaka, Peninsular Malaysia.
Often placed in genus *Hypsipetes*. Monotypic.

Distribution. S Myanmar (Tenasserim S from 12°30' S), S Thailand, Peninsular Malaysia, Riau and Lingga Archipelagos, Sumatra, Bangka and Borneo.

Descriptive notes. 23 cm; 36–41 g. Medium-large, slender, streaky bulbul with rather long and slender bill. Has lores smoky grey, ear-coverts, supercilium and postocular region greyish-olive; crown dark olive (sometimes slight rufous tinge on forecrown), feathers only slightly elongated; upperparts, including upperwing, the same dark olive colour, tertials and flight-feathers with brighter olive-green fringes on outer webs; tail dark olive-brown, outer webs fringed olive; chin to lower breast olive-tinged ashy grey with white shaft streaks, streaks broadest on breast; flanks pale grey with grey-olive tipping, belly to undertail-coverts uniform creamy white; iris dull reddish-brown to deep red; upper mandible blackish-brown, lower mandible dark brownish horn with paler pinky yellow at base; legs reddish-brown, light brown or grey, claws horn-brown. Sexes alike. Juvenile has upperparts and wings mostly warm rufescent brown, breast less distinctly streaked, iris duller brown. Voice. Often noisy. Song a simple, short, rather high-pitched, slightly descending ditty, "chiri-chiri-chu", "chiru-chiru" and similar, or longer phrases e.g. as "ka-jee ka-jee ka-jee, jueee", sometimes running into delicate descending trills. Loud, harsh rattles or rasping calls given while foraging, and often in flight, transcribed as "jizeer jizeer jizeer".



Habitat. Mature broadleaf evergreen forest and tall secondary forest; sometimes encountered at forest edges and in peatswamp kerangas forest. Lowlands and foothills, occasionally to 1100 m (Peninsular Malaysia) or 1200 m (Borneo).

Food and Feeding. Fruit and insects. Many figs taken, including riverside banyans, *Ficus sumatrana* and three (*F. virens*, *F. kerkenhovenii* and *F. stupenda*; mean fruit diameter 7–27·4 mm) of 25 *Ficus* species studied at Kerau, in Peninsular Malaysia. Stomachs of specimens from Sumatra contained seeds, and legs of insects (probably orthopterans). Regularly seen singly or in pairs, sometimes in small (family?) groups; of 108 individuals encountered at Gombak, in Peninsular Malaysia, only eight (7%) were associating with mixed-species flocks. Forages mainly in canopy, occasionally in middle storey. Performs aerial sallies after flying insects.

Breeding. Apr–May, probably also Jun–Jul. In Myanmar, nest reported as a neat cup of moss and bamboo leaves, with lichen and cobwebs interwoven into outer layer, lining of fine dried grass and rootlets; most are probably sited relatively high above ground and therefore difficult to find. Clutch 2 eggs; no information on incubation and nestling periods; both pair-members tend fledglings.

Movements. Resident.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Fairly common to common throughout most of range. Lowland primary forest in Sundaic region is being cleared at a phenomenal rate, and populations of this species must be declining rapidly. Its presence in secondary forests and the more secure foothill forests, however, suggests that it is not at immediate risk of extinction.

Bibliography. Büttikofer (1887), Chasen & Hoogerwerf (1941), Collar *et al.* (2001), Danielsen & Heegaard (1995), Davison (1987), Davison & Chew Yen Fook (1996), Dickinson *et al.* (2002b), Duckworth & Kelsh (1998), Ford & Davison (1995), Gibson-Hill (1949), Holmes (1996), Hume & Davison (1878), Jenkins *et al.* (1996), Jeyarajasingam & Pearson (1999), Lambert (1987), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), McClure (1966, 1967), Medway & Wells (1976), Mees (1986), Rajathurai (1996), Riley (1938), Robson (2000), Smythies (1957, 1986, 1999), Stattersfield & Capper (2000), Thompson (1966), Vowles & Vowles (1997), Wells (2005), Wells *et al.* (1978).

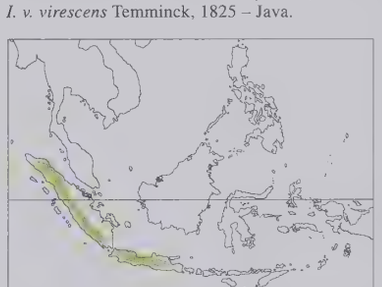
111. **Sunda Bulbul**

Ixos virescens

French: Bulbul verdin **German**: Sumatrabülbül **Spanish**: Bulbul de Sumatra
Other common names: Sumatran/Green-winged/Green Mountain/Green-backed/Streaked Bulbul

Taxonomy. *Ixos virescens* Temminck, 1825, Java.
Often placed in genus *Hypsipetes*. Two subspecies recognized.

Subspecies and Distribution.
I. v. sumatranus (R. G. W. Ramsay, 1882) – W Sumatra (highlands of Barisan Range).
I. v. virescens Temminck, 1825 – Java.



Descriptive notes. 20 cm. Medium-large, slender, streaky bulbul, elongated crown feathering forming small crest. Nominate race has grey crown, greyish-olive cheeks with whitish shaft streaks; upperparts olive-green, brighter and yellower fringing on outer webs of flight-feathers and tail feathers; throat white, contrasting with darker breast, each breast feather conspicuously marked with white shaft and adjoining streak down centre; flanks heavily streaked olive-brown, belly and undertail-coverts creamy white; iris reddish-brown or red; bill black, sometimes grey base of lower mandible; legs blackish-brown or dark grey. Sexes alike. Juvenile is similar to adult but duller, with brown iris. Race *sumatranus* is similar to nominate, but has upperparts, upperwing-coverts and fringing of primaries and secondaries warm olive-brown (lacking yellow tones), ear-coverts brown with pale shaft streaks, throat and breast warm olive-brown (like upperparts) and streaked white. Voice. Calls "chiit-chiit-chiit", and sharper "twink" sounding like call of European Chaffinch (*Fringilla coelebs*).

Habitat. Evergreen forest, edges and secondary growth in mountains, 800–3000 m; highest densities in tall montane forest.

Food and Feeding. A generalist, feeding on fruit and insects. Stomachs of birds from N Sumatra contained mostly fruit ("one round, orange-coloured berry, one dark-blue berry, brown and black pips, fruitpeel, red-pulp, etc."); one individual had been eating "small, black beetles". In Java, recorded as eating variety of fruits, including those identified as *Ficus*, *Lantana camara*, *Glochidion*, *Rubus* and *Podocarpus imbricatus*, as well as invertebrates, including orthopterans, coleopterans, alate termites (Isoptera), caterpillars, and spiders (Araneae). Often found singly or in pairs, when often sluggish and inconspicuous; also forms small noisy parties of 3–6 individuals. Often accompanies mixed-species foraging flocks; in one study, majority of sightings of present species were of individuals in such flocks. Forages in canopy and middle storey.

Breeding. Apr–May in Java. Nest a strongly built, cup-shaped structure, often placed high above ground, sometimes above 10 m, apparently usually attached by upper rim to forking twigs (rather than supported from below) in tree or shrub in forest, at forest edge or in adjacent clearing. Clutch 2 eggs, sometimes only 1; no information on incubation and nestling periods.

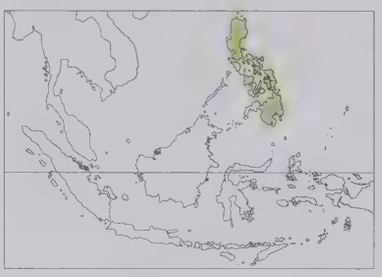
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA and Java and Bali Forests EBA. Fairly common in highland protected areas, such as Kerinci-Seblat National Park, in Sumatra, and Gunung Gede-Pangrango National Park, in Java. As forest in its altitudinal range is not immediately threatened, and because it tolerates highly degraded habitats, this species faces no imminent threat of extinction.
Bibliography. Andrew (1985), Becking (1989), Chasen & Hoogerwerf (1941), Gregory (2000), Hellebrekers & Hoogerwerf (1967), Hoogerwerf (1949a), MacKinnon (1988), MacKinnon & Phillipps (1993), MacKinnon *et al.* (2000), van Marle & Voous (1988), Salvadori (1887), Sargeant (1997), Stattersfield *et al.* (1998), Tobias & Phelps (1994).

112. **Philippine Bulbul**

Ixos philippinus

French: Bulbul des Philippines **German**: Rotbrustbülbül **Spanish**: Bulbul Filipino
Other common names: Rufous-breasted Bulbul

Taxonomy. [*Turdus*] *philippinus* J. R. Forster, 1795, Luzon, Philippines.
Original name species *philippensis* invalid, as preoccupied. Often placed in genus *Hypsipetes*. Often treated as conspecific with *I. rufigularis*, but is much smaller, and no evidence of intergradation where ranges approach each other. Distribution and validity of races provisional; some are weakly differentiated (e.g. *saturatior*) and may not warrant recognition, and others possibly represent separate species; thorough review required. Five subspecies provisionally recognized.
Subspecies and Distribution.
I. p. philippinus (J. R. Forster, 1795) – N Philippines (Luzon, Corregidor, Fortune, Lubang, Polillo, Calagua Is, Marinduque, Banton, Catanduanes).
I. p. mindorensis (Steere, 1890) – Mindoro and Semirara.
I. p. parkesi (duPont, 1980) – Burias.
I. p. guimarasensis (Steere, 1890) – WC Philippines (Ticao, Masbate, Carabao, Borocay, Panay, Gigantes, Calagna-an, Sicogon, Bantayan, Guimaras, Negros, Verde).
I. p. saturatior (Hartert, 1916) – EC & S Philippines (Samar, Buad, Balut, Biliran, Leyte, Cebu, Olango, Mactan, Bohol, Panaon, Calicoan, Mindanao except Zamboanga Peninsula, Cabo, Talicud, Pujada).



Descriptive notes. 22 cm; male 25–45 g, female 22–42 g. Large, noisy, conspicuous bulbul. Nominate race has brownish-grey crown, each feather with light grey fringing; ear-coverts brown with pale shafts (streaked effect); upperparts olive-brown, wings and tail similar, olive fringing on flight-feathers and rectrices; chin and throat washed rufous, with distinct pale shaft streaks; breast rufous-brown; belly, undertail-coverts and underwing dirty white with yellowish wash, thighs and flanks olive; iris dark brown to chestnut; bill black or blackish-horn; legs dark brown to greyish-horn. Sexes alike. Juvenile is similar to adult, but crown and upperparts browner, throat more buff, contrasting pale shaft streaks on throat and breast lacking or inconspicuous. Race *parkesi* is considerably larger than nominate; *saturatior* is very similar to nominate but slightly larger; *guimarasensis* has duller rufous throat, larger bill, substantially longer wing; *mindorensis* has larger bill, deeper olive throat and breast (virtually lacking rufous, inconspicuous shaft streaking), darker abdomen. Voice. Musical. Distinct racial variation inadequately sampled, but nominate race gives "deut doo doo doo da-leee-eut", descending and then rising at end; *saturatior* "deut deut leee deut duet duet duet" or shorter "duet do-lee-eut", both versions rising at "lee" note; *guimarasensis* has longer call beginning with drawn-out "deut deut deut", accelerating into complex series of musical notes similar to songs of other races; *mindorensis* a teetering "we-to we-to we-to-to", leveling off at end. All races give particularly raspy call when alighting or taking flight.
Habitat. Interior of broadleaf evergreen forest, forest edge, shrubby clearings and secondary growth; also in well-cultivated areas with plenty of trees, including coconut groves. Able to survive on small shrubby islets offshore, where often one of the only passerines found. Lowlands, foothills and submontane zones, to 2000 m.
Food and Feeding. Diet includes much fruit and probably some insects, but no details available. Usually found singly or in pairs, less often in small (family?) parties; forages understorey to canopy.
Breeding. Breeding activity recorded Jan–Jul; birds with enlarged gonads and a nestling found in Apr on Mindanao, and birds with enlarged gonads and one female almost ready to lay in Apr on Samar. Cup-shaped nest composed of mixed grasses, fine rootlets, twigs and leaf midribs, woven together and bound compactly with spider webs and cocoon threads, outside diameter 11·6 cm, inside 6·8 cm, normally attached securely in upright fork of small tree or shrub in understorey or in clearing adjacent to forest. Clutch 2–3 eggs; no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally common or very common throughout much of range. Its tolerance of degraded and shrubby habitats suggests that it faces no imminent threat of extinction.
Bibliography. Alonzo-Pasicolan (1992), Brooks, Dutson, Gabutero & Timmins (1995), Brooks, Dutson, King & Magsalay (1996), Brooks, Evans *et al.* (1992), Delacour & Mayr (1946), Dickinson & Dekker (2002b), Dickinson, Dekker *et al.* (2002b), Dickinson, Kennedy & Parkes (1991), duPont (1971), Dutson *et al.* (1992), Evans, Dutson & Brooks (1993), Goodman & Gonzales (1990), Hartert (1916), Kennedy *et al.* (2000), Ogilvie-Grant & Whitehead (1898), Rand & Rabor (1959b, 1960), Ripley & Rabor (1958), Robson & Davidson (1995), Steere (1891).

113. **Zamboanga Bulbul**

Ixos rufigularis

French: Bulbul à gorge rousse **German**: Zamboangabülbül **Spanish**: Bulbul Gorgirrufo
Other common names: Philippine Bulbul (in part), Rufous-breasted Bulbul (in part)

Taxonomy. *Hypsipetes rufigularis* Sharpe, 1877, Malamaui islet and Isabela, Basilan, Philippines.
Often placed in genus *Hypsipetes*. Often treated as conspecific with *I. philippinus*, but is much larger, and no evidence of intergradation where ranges approach each other. Has previously been treated as including race *haynaldi* of *I. everetti*. Monotypic.
Distribution. W Mindanao (Zamboanga Peninsula) and Basilan, in S Philippines.



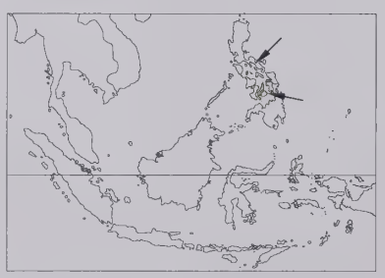
Descriptive notes. 24 cm; 48–71 g, average 59 g. Medium-large, conspicuous bulbul. Crown is dark brown narrowly streaked greyish, upperparts olive-brown; upperwings brown, olive fringing on outer webs of flight-feathers; tail brown with vague olive fringing; chin, throat and breast rufous, mostly lacking shaft streaks; belly, undertail-coverts and underwing-coverts whitish, washed yellow, thighs and flanks olive; iris dark brown; bill black to brownish-horn; legs dark brown to brownish-horn. Differs from rather similar *I. philippinus* in considerably larger size, and lack of conspicuous streaking on throat. Sexes alike, male possibly larger than female. Juvenile undescribed. Voice. Simple monosyllabic calls "chuk", "tweer" and "choik", similar to those of *Pycnonotus goiavier*. Presumed song a rather uninspired "chigur-chigur-chigur-chigur-chigur", rising on the "chi" and falling on "gur"; also faster "chli-chli-chli", usually in series of c. 10 syllables in 2 seconds.
Habitat. Forest and forest edge; tends to be commonest in intact forest.
Food and Feeding. Often visits fruiting trees; probably supplements diet with insects, but no details available. Usually found in small groups in upper and middle levels of forest; often seen in canopy.
Breeding. No information.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Mindanao and the Eastern Visayas EBA. Supposedly common in limited range, but recent searches have produced very few records, suggesting that it is fairly uncommon. Was reportedly numerous around L Lanao, but seems to have declined. Rapid habitat destruction elsewhere in Philippines is causing steep declines in forest fauna, pushing many species closer to extinction. Further surveys required in order to assess whether this species is suffering the same fate. Not known from any protected areas; appropriately sited reserves need to be established on the Zamboanga Peninsula.
Bibliography. Butchart & Stattersfield (2004), Collar, Andreev *et al.* (2001), Collar, Mallari & Tabaranza (1999), Dickinson & Dekker (2002b), Dickinson, Dekker *et al.* (2002b), Dickinson, Kennedy & Parkes (1991), duPont (1971), Gregory (2000), Kennedy *et al.* (2000), Mallari *et al.* (2001), Rand & Rabor (1959b), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

114. **Streak-breasted Bulbul**

Ixos siquijorensis

French: Bulbul de Siquijor **German**: Schieferkopfbülbül **Spanish**: Bulbul de Siquijor
Other common names: Slaty-crowned/Mottle-breasted/Siquijor Bulbul

Taxonomy. *Iole Siquijorensis* Steere, 1890, Siquijor, Philippines.
Taxonomy unsettled. Race *cinereiceps* is vocally, morphologically and behaviourally rather different from others, and likely to merit treatment as a separate species. Nominate race and *monticola* are more similar to each other, but differences may exceed those usually acceptable at race level. Thorough review of species limits necessary. Three subspecies provisionally recognized.
Subspecies and Distribution.
I. s. cinereiceps (Bourns & Worcester, 1894) – Tablas and Romblon, in C Philippines.
I. s. monticola (Bourns & Worcester, 1894) – Cebu.
I. s. siquijorensis (Steere, 1890) – Siquijor, in SC Philippines.



Descriptive notes. 26·5 cm. Large, noisy, conspicuous bulbul. Nominate race has cap to nape very dark brown (giving black-headed impression); upperparts dark olive-brown, feathers narrowly fringed with grey, paler on rump; wings dark olive-brown, wing-coverts and secondaries broadly tipped whitish; tail also dark olive-brown, with ill-defined buffy tips; chin and throat whitish, feathers narrowly fringed with brown; upper breast light greyish-brown with dark brown streaks and dull white shafts, lower breast, belly and undertail-coverts pale grey, slightly smudged buffy-yellow, especially on belly, flanks tan; iris dark brown; upper mandible black or dark brownish-horn, lower mandible dark brown or light brownish-horn; legs blackish-brown. Sexes alike. Juvenile undescribed. Race *monticola* differs from nominate in having paler crown, more rufous back, whiter throat, smaller size; *cinereiceps* differs in grey crown, white throat, olive-brown breast with broad white streaks. Voice. Race *cinereiceps* has varied repertoire, including strident whip-like "whit" notes, often given in complex phrase as "whit pu whit tooer whit whee-er" or "pu-er whit pu-er whit"; *monticola* known to give loud raucous screech.
Habitat. Forest, forest edge, second growth and clearings; at all altitudes (although highest points within its range not particularly high). Some races also in highly degraded scrub, but usually in much lower numbers than found in taller scrub; usually absent from low scrub that is not adjacent to taller growth. On Siquijor, Tablas and Romblon, where *I. philippinus* absent, nominate race and *cinereiceps* tend to be generalists, living in open shrubby habitats as well as in forest. On Cebu, race *monticola* much more specialized on forest, while *I. philippinus* occupies the open-country niche on that island.
Food and Feeding. Small groups recorded at all levels in forest. No other information.
Breeding. Nesting recorded in Jun. No other information.
Movements. Resident.
Status and Conservation. ENDANGERED. Restricted-range species: present in Cebu EBA; also in the Tamblas, Romblon & Sibuyan and Siquijor Secondary Areas. Generally common on Siquijor, where recorded density of 1–3 pairs/ha of habitat; several thousand individuals thought to survive. On Cebu, *monticola* is very rare and often thought extinct, but a few recent sightings at or near the Tabunan reserve; perhaps especially threatened because more reliant on tall forest; this species' habitat niche in scrub appears to have been usurped on Cebu by *I. philippinus*, and the spread of that dominant form perhaps underlies the near-extinction of *monticola*. Race *cinereiceps* undoubtedly rare, as natural habitats have almost been removed from Tablas and Romblon; if elevated to species rank, this taxon would probably be treated as Critical. A century ago, forest cover on Tablas was extensive, but by 1990s only a few small patches were left. Focused conservation action at key

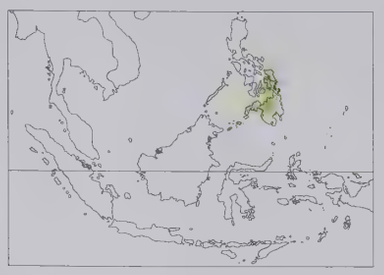
sites is required, and field and laboratory work should address taxonomic issues. Habitat on Tablas, Romblon and Siquijor needs protection, and the Tabunan project on Cebu should be expanded (if *monticola* survives).
Bibliography. Allen (2003), Anon. (1997b), Brooks *et al.* (1995), Butchart & Stattersfield (2004), Collar & Andrew (1988), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Delacour & Mayr (1946), Dickinson *et al.* (1991), duPont (1971), Evans, Dutson & Brooks (1993), Evans, Magsalay *et al.* (1993), Kennedy *et al.* (2000), McClure & Leelavit (1972), McGregor (1907, 1908, 1909–1910), Rand & Rabor (1959b, 1960), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Steere (1891).

115. **Yellowish Bulbul**

Ixos everetti

French: Bulbul d'Everett **German**: Everettbülbül **Spanish**: Bulbul de Everett
Other common names: Yellow-washed/Plain-throated/Everett's Bulbul

Taxonomy. *Criniger Everetti* Tweeddale, 1877, Surigao, Mindanao, Philippines.
Taxonomy unsettled. Races are geographically variable in both morphology and voice; *haynaldi* in particular seems well differentiated, and has previously been placed with *I. rufigularis*. Proposed race *samarensis* (from Samar) indistinguishable from nominate, and considered better synonymized with it. Full review, including genetic analysis, and investigation of vocal variation based on adequate sample, is required in order to ascertain whether more than one species involved. Three subspecies provisionally recognized.
Subspecies and Distribution.
I. e. everetti (Tweeddale, 1877) – EC & SE Philippines (Samar, Biliran, Leyte, Panaon, Dinagat, Siargao, Bucas, W & C Mindanao).
I. e. catarmanensis (Rand & Rabor, 1969) – Camiguin Sur, in SC Philippines.
I. e. haynaldi (W. Blasius, 1890) – SW Philippines (Jolo, Tawi-Tawi, Sanga Sanga, Bongao).
Descriptive notes. 24–25·5 mm; male 52–67 g, female 52–62 g. Large, noisy, conspicuous bulbul. Nominate race has olive-green crown, feathers with brighter and yellower terminal edges, giving a somewhat streaky appearance; upperparts yellowish-olive, more olive on wings and tail, with yellower fringing on flight-feathers; chin yellowish; throat and upper breast cinnamon, washed yellow, becoming browner on ear-coverts and breast; central belly, undertail-coverts, feather shafts on underside of tail, and feathers at carpal joint all green-tinged bright yellow, flanks olive; iris dark brown or reddish-chestnut; bill blackish-grey, sometimes paler grey (difference possibly age-related); legs blackish-grey. Sexes alike, male on average larger than female. Juvenile undescribed, probably a duller version of adult. Race *catarmanensis* is larger than nominate, wing significantly longer, and generally darker, with crown brownish-black and contrasting with dark greenish-olive upperparts, flanks darker olive; *haynaldi* is much duller and slightly larger, with upperparts distinctly brownish-olive, underparts darker (including duller ochraceous wash on throat, much duller yellow breast and belly), wing shorter. Voice. Call a long "peeeee" or "peeeeee-yuk". Song melodious, apparently geographically variable. On Camiguin Sur, race *catarmanensis* gives fluty phrase of 7- 8 notes, rising and falling, "wee-wee wo wee wee-wee wo", followed by "wu-wu-wu-wu" or stuttering "tu-tu-tu-tu"; on Mindanao (nominate) a clear descending 2-second series of whistles, "doo dee-dee-dee-dee-dee dee-boy-aay dee-boy-aaaay", last syllable ascending; on Tawi-Tawi (*haynaldi*) a melodious whistled jingle lasting 4 seconds.



Habitat. Forest, forest edge and secondary growth, below 1000 m; tends to prefer intact forest.
Food and Feeding. Eats fruit and probably insects, but no details on diet or foraging strategy available. Small groups travel either independently or with mixed flocks, at all levels, usually in upper understorey or middle storey.
Breeding. Birds with enlarged gonads in Mar–Jun. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Mindanao and the Eastern Visayas EBA and Sulu Archipelago EBA. Remains fairly common throughout much of its range. Although this species prefers intact forest, it is able to survive in small forest patches in now largely deforested regions.
Bibliography. Dickinson & Dekker (2002b), Dickinson *et al.* (1991), Diesmos & Pedregosa (1995), duPont (1971), Dutson *et al.* (1996), Kennedy *et al.* (2000), Mallari *et al.* (2001), Rabor (1955), Rand & Rabor (1959b, 1960, 1969), Stattersfield *et al.* (1998).



Genus *THAPSINILLAS* Oberholser, 1905

116. Northern Golden Bulbul

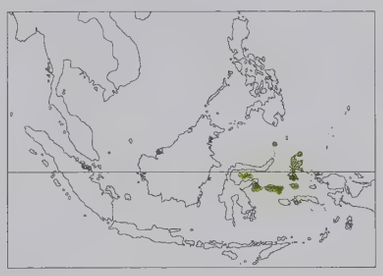
Thapsinillas longirostris

French: Bulbul des Sula **German**: Sulabülbül **Spanish**: Bulbul de la Sula
Other common names: Long-billed Bulbul; Golden Bulbul (when treated as conspecific with *T. affinis*)

Taxonomy. *Criniger longirostris* Wallace, 1863, Sula Islands, Indonesia.
Often placed in an expanded genus *Hypsipetes*, but morphological and vocal distinctions seem too great to permit such treatment. Has also been placed in *Alophoixus*, but genus probably closest to *Ixos everetti*. Usually treated as conspecific with *T. affinis*, but differs vocally. Races exhibit considerable variation in morphology and, particularly, in vocalizations, and probably represent more than one species; full review, including genetic analysis, is required. Six subspecies provisionally recognized.

Subspecies and Distribution.
T. l. platenae (W. Blasius, 1888) – Sangihe I.
T. l. aurea (Walden, 1872) – Togian Is.
T. l. harterti (Stresemann, 1912) – Banggai Is.
T. l. longirostris (Wallace, 1863) – Sula Is.
T. l. chloris (Finsch, 1867) – Morotai, Halmahera and Bacan.
T. l. lucasi (Hartert, 1903) – Obi.

Descriptive notes. 21–22 cm. Large, conspicuous, essentially olive-coloured bulbul with long bill, weak rictal bristles, short legs and weak feet. Nominate race has head, including lores, and upperparts yellowish-olive, short hair-like plumes on hindneck; yellow below, olive shade on breast, strong olive tinge on flanks; iris reddish-brown or dull crimson; bill black or blackish-brown, slightly paler horn at base and along cutting edges; legs pale purplish-brown or dark fleshy brown, soles



rosy, claws greyish. Sexes similar, female eye possibly duller and paler (immature?). Juvenile is slightly duller than adult, with duller and paler iris. Race *platenae* has bright yellow loral spot, light shaft streaking on upperparts; *aurea* resembles nominate, but with much yellower rump, brighter, more golden-yellow underparts; *harterti* differs from nominate in having more olive on breast, which contrasts more strikingly with yellow throat; *chloris* has dusky lores and cheeks, olive-green upperparts, dusky yellow breast and sides (paler on throat), dull olive tail (lacking yellow); *lucasi* is generally brighter than previous, with golden-yellow loral spot, underparts much yellower and less olivaceous, said also to have deep brown iris, pale olive-green bill (darker on culmen) and bluish-grey legs and feet. Voice. Often noisy. On Sangihe, race *platenae* gives high, peeved, nasal "nyeuk!" and deeper, more thrush-like "puk!" while foraging; song appears to consist of a choppy and erratic series of glancing hard notes (harder and less jumbled than in other races). On Taliabu, nominate race gives emphatic husky chattering "che" or "chir!" notes, often accelerating into repetitive, loud, fluty and melodious song phrase (e.g. "che-che-che-chiwiyo-chiwiyo-chiwiyoo"), whole sequence given every few seconds; also produces long meandering sequences of clipped notes of varying pitch and inflection. On Halmahera, *chloris* song a hurried, cheery, jumbled babbling, recognizably bulbul-like, e.g. "chikwi-chikwi-chikwidilyu", often repeated after short intervals (1–2 seconds), and interspersed with longer phrases that tumble down scale at end, "chikwi-chikwi-chikwid-dlyudidlydidlydidlydyu". On Obi, a frequent call of *lucasi* transcribed as "tweeuwip", and groups gave raucous calls reminiscent of Red-flanked Lorikeet (*Charmosyna placentis*) but without latter's harsh or scratchy quality. Song of all races lacks long sliding notes and descending cadence prevalent in song of *T. affinis*. Several races (including *chloris* and nominate) utter high, ringing, slightly nasal, lorikeet-like "twee, twee" notes, often in series, or long nasal whining notes ("wiiiiieeee"), but neither of these call types thought to be given by *platenae*.

Habitat. Prefers interior of broadleaf evergreen forest, or light woodland, from sea-level to 1700 m. On Taliabu (Sula Is), nominate race occurs in primary forest, secondary forest and clearings, from lowlands to montane zone, but seems commonest in montane primary forest. Most races (including *aurea*, *harterti* and nominate) not confined to intact forest, thriving in secondary growth and plantations; often found in scrub at edge of disturbed forests on Obi (*lucasi*). On Sangihe, however, race *platenae* usually absent from secondary growth and plantations, showing strong preference for small remnants of relatively intact forest, up to c. 1000 m.

Food and Feeding. Diet and foraging strategy undocumented; thought to eat fruit and insects. On Sangihe, usually encountered in groups of 3–6 individuals, sometimes up to ten; in Banggai Is (race *harterti*) groups of 3–4 individuals were commonly seen.

Breeding. Nest containing 2 eggs found in Sula Is (nominate) in Oct–Nov; individual carrying nesting material in Dec on Obi (*lucasi*); birds in breeding condition in Sept on Halmahera (*chloris*). No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Said to be common or abundant on Banggai (race *harterti*), Taliabu and other islands in Sula Group (nominate), Obi (*lucasi*) and Halmahera (*chloris*). On Obi, up to ten recorded daily during a recent visit, and on Halmahera this species was noted at about half (162) of all point localities during one survey of forest. Sangihe race *platenae* is restricted to ridge forest on Gunung Sahengbalira, where thought that only 20–230 individuals survive; as this taxon may well qualify as a distinct species, it requires immediate conservation attention; fortunately, a conservation project is already under way to protect forest at this site.

Bibliography. Bishop (1992), Coates & Bishop (1997), Davidson & Stones (1993), Delacour (1943), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Hartert (1898), Indrawan *et al.* (1997), Linsley (1995), Meyer & Wiglesworth (1898), Poulsen & Lambert (2000), Poulsen *et al.* (1999), Riley (1997a, 1997b, 2002), Stones *et al.* (1997), Wallace (1862), Wardill & Riley (1999), White & Bruce (1986).

117. **Southern Golden Bulbul**

Thapsinillas affinis

French: Bulbul à queue d'or **German**: Goldschwanzbülbül **Spanish**: Bulbul Colidorado
Other common names: Golden Bulbul (when treated as conspecific with *T. longirostris*)

Taxonomy. *Criniger affinis* Hombron and Jacquinot, 1841, Waru, Seram, Indonesia.
Often placed in an expanded genus *Hypsipetes*, but morphological and vocal distinctions seem too great to permit such treatment. Has also been placed in *Alophoixus*, but genus probably closest to *Ixos everetti*. Usually treated as conspecific with *T. longirostris*, but differs vocally. Although race name *mysticalis* often given as *mystacalis*, original spelling stands, as no official emendment has been made. This race exhibits pronounced morphological and vocal differences from nominate and *flavicaudus*, and may represent a separate species. Three subspecies provisionally recognized.

Subspecies and Distribution.
T. a. mysticalis (Wallace, 1863) – Buru.
T. a. affinis (Hombron & Jacquinot, 1841) – Seram.
T. a. flavicaudus (Bonaparte, 1850) – Ambon.



Descriptive notes. 22–24 cm; 46 g. Large, conspicuous, olive and yellow bulbul with long bill, weak rictal bristles. Nominate race has small bright yellow spot on lores; otherwise, yellowish-olive above, short hair-like plumes on hindneck, distal third of tail conspicuously bright yellow; underside similar to upperside, but paler; iris warm brown to bright blood-red; bill blackish, paler horn base and cutting edges; legs dark slate. Sexes alike. Juvenile not described. Race *flavicaudus* is much as nominate but slightly longer-winged, tends to be lighter and yellower on upperside and breast, with deeper yellow throat; *mysticalis* is quite different, lacking yellow in tail, has yellow on lores, underparts strongly olive-green with paler shaft streaks, contrasting yellow chin, iris possibly dark brown or black (verification needed). Voice. Song on Seram and Ambon (nominate, *flavicaudus*) a distinctive mournful series of sweet and minor-key notes, lasting 2–4 seconds, slightly erratic or meandering in pace and note length, but essentially slow and leisurely, sliding down scale almost throughout (sometimes slight terminal rise), usually given in bouts, with intervals of 10–20 seconds between songs, sometimes interspersed with harsh single "chrek" or "kruk" notes (these often given while foraging, occasionally in chattering series). Song on Buru (*mysticalis*) vaguely similar but much more complex, beginning with a series of chipping notes (sounding like "kek, kek..."), sometimes involving meandering pitch changes, followed by sequence of whistled notes so distinctly upslurred or warbled as to be polysyllabic, whole effect being of higher-pitched and more tinkling song than that of other two races; Buru race also produces longer, chattering song-like phrase with clipped notes (rather than whistles), tumbling in pitch at end, reminiscent of *Pycnonotus* in tone. At least on Seram (nominate), also a raucous series of piercing, parakeet-like notes (alarm?), sometimes starting and ending more hesitantly, "ki-ki-ki-ki-kréé!-ktéé!-kréé!-kre, kr, kr, kr".

Habitat. Broadleaf evergreen forest, or light woodland, from sea-level to 1700 m. On Seram, occurs from sea-level to submontane forest at 950 m, but seems commonest at lower and middle altitudes. Tolerant of highly degraded forest in lowlands of Seram and Buru, occurring in small gardens cut into forest and in secondary forest down to sea-level in some areas.

Food and Feeding. No information on diet. Occurs at all levels, from understorey to subcanopy. On Seram, often forages with mixed-species flocks in middle storey, and occasionally on forest floor, hopping among leaf litter, in manner of a thrush (Turdidae).

Breeding. Nest containing 2 eggs found in Feb on Buru. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Not evaluated. Fairly common throughout Seram, occurring in Manusela National Park. In E Seram was found to be common at all altitudes from sea-level to 900 m, and one of the most commonly encountered bird species, especially at low altitudes; numbers seen per 100 hours of fieldwork were 98 at Wae Fufa (c. 500 m) and 213 at Hoti (50 m), with respective figures rising to 193 and 231 when those only heard (not seen) are included; in addition, 374 seen/heard per 100 hours at Wae Salas (100 m). Not in any immediate danger of extinction.

Bibliography. Bowler & Taylor (1989, 1993a), Coates & Bishop (1997), Delacour (1943), Dickinson & Dekker (2002b), Isherwood *et al.* (1997), Marsden (1998), Poulsen & Lambert (2000), Siebers (1930), White & Bruce (1986).

Genus *MICROSCELIS* G. R. Gray, 1840

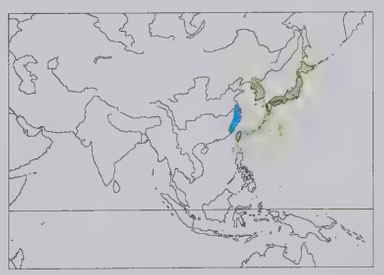
118. **Brown-eared Bulbul**

Microscelis amaurotis

French: Bulbul à oreillons bruns **German**: Orpheusbülbül **Spanish**: Bulbul Orejipardo
Other common names: Japanese/Chestnut-eared Bulbul

Taxonomy. *Turdus amaurotis* Temminck, 1830, Japan.
Usually placed in *Ixos* or *Hypsipetes*, but divergent morphology suggests that it belongs in its own genus. When placed in an expanded *Hypsipetes* (then also including *Thapsinillas*), race name *harterti* becomes invalid, as preoccupied, and alternative name *nagamichii* is available. Several of the listed races seem weakly differentiated, and possibly invalid. In addition, proposed races *hensoni* (from Hokkaido), *kanrasani* (Quelpart I) and *septentrionalis* (S Sakhalin, non-breeding) considered synonymous with nominate; *insignis* (S Ryukyus) doubtfully distinct from *pryeri* and thus merged with it. Eleven subspecies provisionally recognized.

Subspecies and Distribution.
M. a. amaurotis (Temminck, 1830) – Japan S from Hokkaido (except S Kyushu), and S Korea; non-breeding S to E China and Ryukyu Is.
M. a. matchiae Momiyama, 1923 – S Japan (S Kyushu).
M. a. ogawae (Hartert, 1907) – N Ryukyu Is.
M. a. pryeri (Stejneger, 1887) – C Ryukyu Is.
M. a. harterti (Nagamichi Kuroda, 1922) – extreme S Ryukyus (Yonaguni-jima), Taiwan and Lanyu.
M. a. borodinonis (Nagamichi Kuroda, 1923) – Borodino Is (Kita-daito-jima).
M. a. squamiceps (Kittlitz, 1831) – Bonin Is.
M. a. magnirostris (Hartert, 1905) – Volcano Is (Kito-iwo-jima, Iwo-jima).
M. a. batanensis (Mearns, 1907) – extreme N Philippines (Batan, Ivohos, Sabtang, Babuyan Claro).
M. a. fugensis (Ogilvie-Grant, 1895) – N Philippines (Calayan, Dalupiri, Fuga).
M. a. camiguinensis (McGregor, 1907) – N Philippines (Camiguin Norte).



Descriptive notes. 28 cm. Large, boisterous, highly conspicuous bulbul, elongated and pointed crown feathers forming slight crest; strong undulating flight. Nominate race has crown and nape feathers pale ashy grey, tipped greyish-white; ear-coverts and side of neck chestnut; upperparts dark ashy grey, wings and tail slightly browner than back; throat and breast grey, lower breast and centre of belly with increasingly larger white spots, flanks and thighs grey-brown, undertail-coverts dark grey, broadly edged white; iris red-brown to dark brown (variation possibly age-related); bill dark brown to black; legs dark brown to brownish-pink. Sexes similar. Juvenile is browner than adult, lacking silvery wash. Race *matchiae* has greyer chestband than nominate; *ogawae* has longer wings, pale grey belly and lower breast; *borodinonis* resembles previous, but has paler underparts, darker chestnut ear-coverts and throat, broader olive margins on upperpart feathering, especially crown, back and tail; *pryeri* is similar to nominate but smaller, with cap darker, upperparts more olivaceous, underparts buffy brown (rather than grey),

On following pages: 119. Ashy Bulbul (*Hemixos flavala*); 120. Cinereous Bulbul (*Hemixos cinereus*); 121. Chestnut Bulbul (*Hemixos castanonotus*).

broad collar of warm brown across lower throat; *harterti* is browner throughout, becoming dark rufous on breast; *squamiceps* is slightly smaller than nominate, underparts tinged brown (rather than grey), broad dusky pectoral band; *magnirostris* is similar to previous, but has stronger bill, paler upperparts, narrower rufous collar on lower throat; *batanensis* is larger, with pale forehead, chestnut wash on breast; *fugensis* is like previous but much smaller, with greyer forehead; *camiguinensis* is also similar, but smaller, with greyer flanks. VOICE. Noisy; loud "shreep" and "weesp" notes given throughout year. In Philippines, voice described as harsh "pee-yuk", or descending, accelerating series, "pee-yuk p-uk p-uk p-uk".
Habitat. Deciduous, mixed and evergreen forests in lowlands and foothills, to 1600 m (occasionally 2100 m) in breeding season; in winter, occurs in open agricultural country with groves of trees and hedgerows. Also in suburbs and urban areas, parks and gardens.
Food and Feeding. Eats a wide variety of berries, including holly (*Ilex integra*); also citrus fruits (especially mikan oranges) and leaf vegetables during winter in Japan. Also visits gardens to forage on nectar-rich camellias and other flowers. Sometimes eats insects. Normally occurs in groups. Berries usually plucked while bird is perched. Aggressive and dominant at winter birdfeeders.
Breeding. Apr–Jul, sometimes Aug; multi-brooded, at least in S. Builds sturdy cup-shaped nest 1·5–4·5 m up in lower branches of tree, bush, vines, or in variety of man-made structures. Clutch 3–5 eggs, usually 4; incubation period 13–14 days; fledging period 10–11 days; family remains on territory for a further 2 months.
Movements. Mostly resident. N breeders (e.g. those on Hokkaido) move S or downslope from end Sept, often arriving in plains or suburbs of cities in large numbers during winter. Migration during daylight, sometimes in large flocks; fairly high numbers migrate through Korea in passage. Non-breeding visitor in E China (Jiangsu S to, probably, Fujian), transient in NE.
Status and Conservation. Not globally threatened. Generally abundant and conspicuous throughout Japan, particularly on smaller offshore islands. Locally common in South Korea, uncommon in Taiwan, common in Philippines. Common in China in non-breeding season. In N Japan (SE Hokkaido), mean number of birds/2 km transect ranged from 0·3 in mixed forest to 0·9 in wooded farmland and 1·0 in residential areas; in Japan, has in recent decades expanded its range into urban areas, where now breeds even in city centres (e.g. Osaka). Considered a pest in Japan because of its habit of feeding on commercial fruit and vegetable crops. Acts as a dispersal agent for seeds of a variety of plants.
Bibliography. Brazil (1991), Chang James Wanfu (1993), Cheng Tsohsin (1987), Collar (2004c), Delacour & Mayr (1946), Dickinson & Dekker (2002b), Dickinson, Dekker *et al.* (2002b), Dickinson, Kennedy & Parkes (1991), duPont (1971), Étchécopar & Hüe (1983), Fujimaki (2004), Fukui (1995, 2003), Gore & Won Pyongoh (1971), Kawakami & Fujita (2004), Kennedy *et al.* (2000), Kurosawa & Askins (2003), Lee Woo-Shin *et al.* (2000), MacKinnon & Phillipps (2000), Matsuo (2004), Meyer de Schauensee (1984), Mishima (1960), Severinghaus (1978), Tomek (2002).

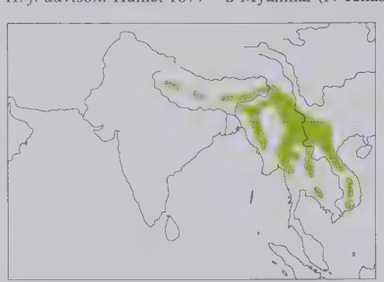
Genus *HEMIXOS* Blyth, 1845

119. **Ashy Bulbul**

Hemixos flavala

French: Bulbul à ailes vertes **German**: Weißkehlbülbül **Spanish**: Bulbul Ceniciento
Other common names: Brown-eared Bulbul(!)

Taxonomy. *H[emixos]. flavala* Blyth, 1845, Nepal.
Sometimes included in expanded genus *Hypsipetes*. Forms a superspecies with *H. cinereus* and *H. castanonotus*, and all often treated as conspecific, but morphological and vocal distinctness of constituent taxa suggests that they are best viewed as allospecies; full review necessary to determine relationship among forms. Isolated race *remotus* is notably divergent, and may warrant elevation to species rank. Five subspecies provisionally recognized.
Subspecies and Distribution.
H. f. flavala Blyth, 1845 – E Himalayas from N India (E from Uttar Pradesh, including S Assam hills) E to SE Tibet, NW Myanmar and S China (W Yunnan), and NE Bangladesh (Sylhet).
H. f. bourdellei Delacour, 1926 – S China (S Yunnan), E Myanmar, NE Thailand and N & C Laos.
H. f. remotus (Deignan, 1957) – S Laos, S Vietnam (S Annam) and SE Cambodia.
H. f. hildebrandi Hume, 1874 – S Myanmar and W Thailand.
H. f. davisoni Hume, 1877 – S Myanmar (N Tenasserim) and SW Thailand.



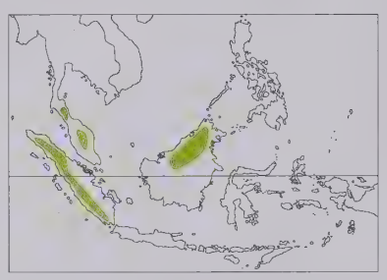
Descriptive notes. 20–21 cm. Medium-large, dark, conspicuous bulbul, crown feathers often raised into full rounded crest; throat feathers often puffed out. Nominate race has crown dark grey, black lores and moustachial stripe bordering pale brown (tawny) ear-coverts; upperparts grey, tail dark brown with olive margins; wings dark brown, inner remiges and greater wing-coverts broadly fringed bright golden with olive tinge (forming large wing patch); white below, with cold grey breast; iris dark reddish-brown; bill black; legs dark brown or dark reddish-horn, soles yellowish-white, claws blackish-brown. Sexes alike. Juvenile is slightly duller and browner (especially on upperparts), with shorter crest, much duller gold in wing, paler bill. Race *bourdellei* has crown, crest, lores and cheeks black, upperparts browner (less olive), underparts whiter; *remotus* has much paler and browner dark head markings, mid-brown upperparts, brownish-tinged breast; *hildebrandi* is similar but slightly larger, with blackish-brown crest and face markings, brownish-grey upperparts; *davisoni* has rich warm brown crown and warm brown upperparts. VOICE. Song, given throughout year, a variety of simple phrases, mostly short, quick, perky and metallic, interspersed with sharp whistles and weak buzzy notes, usually simple e.g. "skrink-er, rink", with second note markedly lowest and last one marginally highest, but sometimes more complicated and jerky, usually alternating between lower-pitched, weaker note and higher, sharper one, e.g. a squawky "skrink-er, rink-er-rink"; in full song, phrases repeated after very short pauses in rambling monologue, and voice rich enough to sound almost like that of a thrush (Turdidae). Marked regional differences in repertoire. Calls include short, abrupt, twangy buzzes, "kzzp" and "bzier", mixed with range of rich and rather musical chatters.
Habitat. Broadleaf evergreen forest, pine (*Pinus*) forest, bamboo patches, edges and nearby plantations in ravines and foothills; occasionally enters tea plantations in India. Usually at 700–1600 m, sometimes to 2100 m; regularly down to adjacent plains and cultivation in non-breeding season; rarely to sea-level. In Khasi Hills (Meghalaya), in India, confined to highest ridges.
Food and Feeding. Fruit, insects and a variety of other items. Feeds on flowers and fruit of *Leucospectrum* and *Heptapleurum* in Myanmar; also eats nectar (face and forecrown often dusted with pollen) and invertebrates, the latter sometimes caught in aerial sallies. Bold and noisy; in pairs during breeding, forming flocks of up to 30 in non-breeding season. Forages at all levels, but usually in middle stratum or subcanopy. One flock recorded as feeding in a flowering "tea-seed" garden.
Breeding. Breeds Apr–Jul. Reports of male assisting with nest-building and incubation require confirmation. Nest a compact cup-shaped structure, strongly built, composed of grass, dead leaves and (sometimes) bamboo leaves, lined with coarse grass stems, less often a few fern roots and scraps of moss, placed low down (1–2 m above ground) and usually well hidden in thick bush, low tree, bracken or vine tangle; one reported as 12 m up in tree, and others reported in wild citrus tree in open scrubby forest. Clutch usually 3 eggs, sometimes 2, rarely 4; incubation period 13–14 days; nestlings fed by both sexes, no information on nestling period.
Movements. Resident, subject to altitudinal movements.
Status and Conservation. Not globally threatened. Generally scarce and local in Nepal, NE India (e.g. Assam and Meghalaya) and N Myanmar (e.g. Chindwin); regular in forests of NE Bangladesh (Sylhet), and historical reports from E Myanmar suggest that it was fairly common; locally common in N Thailand, sometimes in large flocks; locally fairly common in Laos and Vietnam. First recorded in SE Cambodia (at Dak Dam) in 1997. As most large passerines of SE Asian submontane forests, this species is often hunted by hill tribesmen, but its wide geographical range and its tolerance of heavily degraded habitat suggest that it faces no immediate threat of extinction.
Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Bingham (1903), Bingham & Thompson (1900), Birand & Pawar (2004), Cheng Tsohsin (1987), David & Gosselin (2002a), Davidson (1998), Deignan (1945), Delacour (1926), Dickinson *et al.* (2002b), Duckworth & Hedges (1998), Duckworth, Salter & Khounboline (1999), Grimmett *et al.* (1998), Harington (1909a), Harvey (1990), Hopwood (1912), Hume & Davison (1878), Inglis (1896), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Mears & Oates (1907), Meyer de Schauensee (1984), Oustalet (1903), Rasmussen & Anderton (2005), Riley (1938), Rippon (1901), Robinson & Kloss (1919a), Robson (1997a, 2000), Robson *et al.* (1993b), Smythies (1986), Stanford & Mayr (1940–1941), Stepanyan (1995), Stevens (1914–1915, 1923–1925), Stresemann & Heinrich (1939), Stuart Baker (1892–1893, 1922–1930), Wells (1990a), Zheng Guangmei & Zhang Cizu (2002).

120. **Cinereous Bulbul**

Hemixos cinereus

French: Bulbul terreux **German**: Malaya-Weißkehlbülbül **Spanish**: Bulbul Cinereo

Taxonomy. *I[ole]. cinerea* Blyth, 1845, Melaka, Peninsular Malaysia.
Sometimes included in expanded genus *Hypsipetes*. Forms a superspecies with *H. flavala* and *H. castanonotus*, and all often treated as conspecific, but morphological and vocal distinctness of constituent taxa suggests that they are best viewed as allospecies; full review necessary to determine relationship among forms. Two subspecies provisionally recognized.
Subspecies and Distribution.
H. c. cinereus (Blyth, 1845) – S Thailand, Peninsular Malaysia and Sumatra.
H. c. connectens Sharpe, 1887 – N Borneo.



Descriptive notes. 20·5–21 cm; 27–35 g. Medium-large, arboreal, conspicuous bulbul, elongated and pointed feathers of cap and upper neck often raised as crest, long, erectile chin and throat feathers often puffed out. Nominate race has crown and upper neck ash-brown with prominent pale grey feather tips, indistinct pale grey supercilium; area below eye matt black with fine grey tipping, ear-coverts and side of neck pale brown-grey; upperparts fairly dark ashy brown with low-contrast dull grey tipping; upperwing-coverts as mantle, but with dull grey outer-web edging and tipping; primary coverts, flight-feathers and tail fairly dark ashy brown; chin and throat white, contrasting sharply with face and with uniform dull grey-brown breast and flanks; belly to undertail-coverts whitish; iris dark brown to brownish-red (variation age-related and possibly sex-related); bill black; legs dark greenish-grey to slaty black. Differs from *H. flavala* in much browner and more uniform plumage. Sexes alike. Juvenile is similar to adult, but has less distinct face pattern, duller iris (usually pale cinnamon-brown or greyish-brown), paler legs. Race *connectens* differs from nominate in having less black on face and moustachial area, olive-yellow fringing on wings and tail, and yellow vent and undertail-coverts. VOICE. Regular calls by group-members are a series of loud ringing "tree-tree-tree", a whining "whear", sharp "chiap", and double "wheesh-wheesh" whistle. Song a brief, sweet "beelee-bear beelee burlee", less choppy and metallic than that of *H. flavala*. In Borneo (race *connectens*) thought to be relatively quiet, but has voice similar, a harsh "trrk", low reedy "di-deet di-deet" and low throaty "to to to".
Habitat. Montane broadleaf evergreen forest (primary or selectively logged) and secondary growth. Recorded at 500–2000 m in Sumatra. In Peninsular Malaysia, inhabits submontane zone to recorded maximum altitude of 2000 m, and appears to commute to lowlands on irregular foraging excursions, then frequenting riverine and other tall forest edge, secondary forest, wooded parkland and scrub, down to sea-level; noted also as roosting in open *Phragmites* reedbeds. In Borneo (*connectens*) usually in uplands, but locally resident in lowlands, e.g. Niah Caves (Sarawak); in Maliau basin (Sabah), found in *Agathis* forest and kerangas (low-stature forest on nutrient-poor soils) above 880 m.
Food and Feeding. Fruits, including berries, and seeds; also insects, on Borneo including cicadas (Hemiptera) and crickets (Orthoptera). Recorded items include the "berries" of mass-producing *Lindera pipericarpa*, fruits of understorey *Eurycoma longifolia*, and figs, including non-forest banyans, *Ficus glabella* and *F. sumatrana*; of 25 *Ficus* species studied at Kerau, in Peninsular Malaysia, only one (*F. binnendykii*, mean minimum fruit diameter 7·8 mm) was taken by this species. In Borneo, said to eat many berries, seeds and other fruits, e.g. *Litsea cubica*. Often gregarious, gathering in parties of up to six or more with other bulbuls in fruiting trees; occasionally in loose flocks of almost 20, but a count of almost 100 in Singapore exceptional (several foraging parties likely to have converged). Sometimes attends mixed-species flocks. Forages mainly in canopy, middle storey and edge. Fruits either plucked while bird perched or snatched in brief hovering

flight. Insects plucked from branches, or caught during short aerial sallies, sometimes vertically upwards, from exposed perch.
Breeding. Feb–Jun. One nest was an open cup, placed 3 m above ground in small roadside tree in montane forest. One brood of two fledglings, tended by both pair-members. No other information.
Movements. Resident, with post-breeding dispersive movements. In Peninsular Malaysia, dispersal appears to occur annually, and probably seasonally, but incidence varies, and birds tend not to remain long at any one site; records in lowlands fall between Aug and April, with peak in Sept–Dec, suggesting regular altitudinal migration; influxes reported at low altitudes, down to sea-level, and individuals recorded as far afield as Singapore and even Riau Archipelago (Bintan I). The very few breeding records are from montane zone, and believed that only non-breeders range into lowlands. No seasonal movements described in Borneo and Sumatra.
Status and Conservation. Not globally threatened. Not evaluated. Generally common in mid-montane habitat throughout range, but scarce in N Sumatra. In Peninsular Malaysia, regular and common in uplands, including Fraser's Hill and Cameron Highlands. Said to be abundant in Kelabit uplands of Borneo. Its montane breeding habitat, fairly wide ecological tolerance and mobility imply that this species is still at low risk overall. Occurs within several protected areas, including Kerinci-Seblat National Park, in Sumatra, and at lower levels of Mount Kinabalu National Park, in Borneo.
Bibliography. Büttikofer (1887), Chasen & Hoogerwerf (1941), Davison (1987, 1997a), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Gibson-Hill (1949), Holmes (1996), Hume (1878a), Jenkins *et al.* (1996), Jeyarajasingam (1990), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Marsh (1989), McClure (1964, 1966), Medway (1972), Medway & Wells (1976), Rajathurai (1996), Riley (1938), Robson (2000), Smythies (1957, 1999), Tobias & Phelps (1994), Wells (2005), Wells *et al.* (1978).

121. **Chestnut Bulbul**

Hemixos castanonotus

French: Bulbul marron **German**: Hainan-Weißkehlbülbül **Spanish**: Bulbul Castaño
Other common names: Chestnut-backed Bulbul

Taxonomy. *Hemixus castanonotus* Swinhoe, 1870, Tai-ping-sze and near Lingmun, central Hainan. Sometimes included in expanded genus *Hypsipetes*. Forms a superspecies with *H. flavala* and *H. cinereus*, and all often treated as conspecific, but morphological and vocal distinctness of constituent taxa suggests that they are best viewed as allospecies; full review necessary to determine relationship among forms. Two subspecies recognized.
Subspecies and Distribution.
H. c. canipennis Seebohm, 1890 – S China (S Hunan, Guangxi, Guangdong, Fujian) and NE Vietnam (Tonkin).
H. c. castanonotus Swinhoe, 1870 – N Vietnam (E Tonkin) and S China (Hainan).
Descriptive notes. 21·5 cm. Medium-sized, noisy, conspicuous bulbul with slightly decurved bill, elongated crown feathers often raised into a crest. Nominate race has forehead chestnut, darkening



to black tinged with reddish-brown on head side and crown; upperparts rich ruddy brown; wings dusky brown, fringed yellowish-green on upperwing-coverts, secondaries and tertials; tail feathers dusky brown, lightly edged greenish-yellow; chin and throat white; underparts whitish, tinged brownish-grey on breast and flanks; iris very dark brown to reddish-brown; bill black; legs black. Sexes alike. Juvenile has much duller head side and upperparts, much paler brown crown, paler and more uniform wings, browner breastband. Race *canipennis* has darker side of head, upperwing-coverts, secondaries and tertials fringed whitish-grey, tail feathers without edging. Voice. Noisy throughout year. Sings with clear, simple, jolly, whistled phrases, e.g. "whi-wi-wu" or "to-to te-wee", usually interspersed with churred notes, often just a simple phrase, at other times semi-continuously from prominent high perch in manner of thrush (Turdidae); quite similar to song of *H. flavala*, but usually thinner and less thrush-like. In flocks, individuals call to each other with harsh single notes.
Habitat. Broadleaf evergreen forest, edges and secondary growth, in hilly lowlands up to 1000 m. Not restricted to tall or mature growth; thrives in brushy ravines and low-stature montane woodland.
Food and Feeding. Eats large quantities of small berries and other fruit; insects and larvae, including caterpillars, also caught, and apparently consumes many moths (Lepidoptera), snatching them in flight after flushing them from hiding places. Often seen in noisy flocks of up to 35 individuals outside breeding season. Probably similar in ecology to *H. flavala*.
Breeding. May–Jul in China; two or more broods. Breeds in territorial pairs. Nest built by female (unassisted?), a deep, compact, cup-shaped structure made from moss, leaves, leaf skeletons, strips of bark and other fibrous material, lined with fine grasses and rootlets, placed at variable height (usually 2–5 m) above ground in fork in tree or bush. Clutch 3 eggs; no information on incubation and nestling periods.
Movements. Generally resident; some movement S in winter. In Hong Kong, where resident population exists, is also an irregular (irruptive) non-breeding visitor Oct–Apr, common in some years, rare in others.
Status and Conservation. Not globally threatened. Often common. Survives even in areas where human population is high. Range seems to be expanding and numbers increasing in some peripheral areas, e.g. Hong Kong. Breeding populations often very densely packed in well-wooded habitats, and numbers remain high near villages and towns.
Bibliography. Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Étchécopar & Hüe (1983), Lewthwaite (1996), MacKinnon & Hicks (1996), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Nguyen Cu *et al.* (2000), Robson (2000, 2002c), Stepanyan (1995), Strange (2002), Swinhoe (1870), Webster (1975), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002).



Genus *HYPSIPETES* Vigors, 1831

122. Himalayan Black Bulbul

Hypsipetes leucocephalus

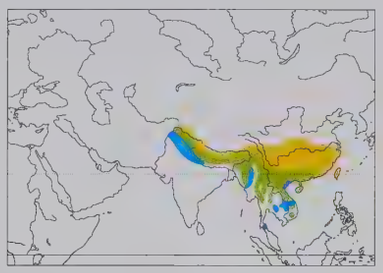
French: Bulbul noir **German**: China-Rotschnabelbülbül **Spanish**: Bulbul Negro
Other common names: Black Bulbul (when treated as conspecific with *H. ganeesa*)

Taxonomy. [*Turdus*] *leucocephalus* J. F. Gmelin, 1789, Guangzhou, Guangdong, south China. Previously included within a broad *H. madagascariensis*. Usually treated as conspecific with *H. ganeesa*, but marked differences in morphology and vocalizations indicate that the two are better considered separate species. Races of present species exceptionally diverse; full review of geographical variation, including adequate sample of recorded songs (not calls), required in order to assess whether more than one species involved. Proposed race *impar* (from Langbian massif, in S Vietnam) treated as a synonym of *concolor*, but may, in view of its geographical isolation, deserve recognition; further study required. Ten subspecies provisionally recognized.

Subspecies and Distribution.

H. l. psaroides Vigors, 1831 – Himalayas from NE Afghanistan (Kunar Valley) and N Pakistan E to NE India (Arunachal Pradesh, also S Assam hills), S Tibet and NW Myanmar; old record(s) in C India.
H. l. nigrescens Stuart Baker, 1917 – NE India (E Assam and Manipur) and W Myanmar (including Chin Hills and Arakan).
H. l. sinensis (La Touche, 1922) – breeds S China (NW Yunnan); non-breeding Thailand, Laos and Vietnam.
H. l. stresemanni (Mayr, 1942) – breeds S China (N Yunnan); non-breeding Thailand and Laos.
H. l. ambiens (Mayr, 1942) – NE Myanmar and S China (Salween watershed, in W Yunnan).
H. l. concolor Blyth, 1849 – E Myanmar, S China (S Yunnan) and Indochina.
H. l. leucothorax (Mayr, 1942) – breeds C China (S Shaanxi, Sichuan, Hubei); non-breeding W, N & E Myanmar, N & NE Thailand, N Vietnam (Tonkin).

H. l. leucocephalus (J. F. Gmelin, 1789) – breeds SE China (S Anhui, Zhejiang and Hunan S to Guangxi and Guangdong); non-breeding E Myanmar and N Indochina.
H. l. nigerrimus Gould, 1863 – Taiwan.
H. l. perniger Swinhoe, 1870 – S China (Hainan); possibly also N Vietnam (E Tonkin).



Descriptive notes. 23·5–26·5 cm. Large, noisy, conspicuous bulbul with expressive, ragged crest, broadly triangular tail notched and splayed somewhat like that of a drongo (*Dicrurus*). Nominate race has all-white head, blackish upperparts, paler on rump; sooty grey below, feathers of belly and undertail-coverts streaked or tipped whitish; iris brown to dark brown, eyelids edged orange; bill deep orange, tinged reddish at base, mouth orange; legs orange, claws horn. Sexes usually alike, female generally smaller than male. Juvenile lacks crest, is dull brown overall, with duller bill and legs, pale grey underparts mottled brownish or greyish (throat and belly whitest, breast darkest), rufescent wing edgings; usually indistinguishable from adult after post-juvenile moult. Race *psaroides* lacks pure white in plumage, is slate-grey throughout, with blackish crown, broad blackish malar bordering paler grey face, whitish-grey central belly, pale-edged undertail-coverts, iris deep chestnut, eyelid black, bill, tongue and legs bright coral-red, claws horn-brown; *nigrescens* is darker blackish-grey above and below, lacks grey patch above lores or behind eye, no contrast between cap and mantle, bare-part colours as previous; *concolor* is even darker, blackish above, with no distinct contrast between cap and upperparts, slightly paler grey below, blackish malar patch; *ambiens* is overall blacker; *sinensis* is very like previous but sometimes quite grey below, occasionally 2–3 white feathers on forehead (possible hybrids), iris deep chestnut, bill and legs bright red; *stresemanni* is similar to nominate (head and breast white), but body entirely blackish-grey, lacking paler grey tones, bare-part colours as nominate; *leucothorax* is inseparable from previous in field, female closely resemble male of previous but slightly smaller; *nigerrimus* is black with conspicuous grey margins on flight-feathers, dark greyish underparts; *perniger* is almost entirely black, but with deep greyish-green gloss on margins of upperpart and underpart feathers (not wings and tail), iris deep chestnut, bill and legs bright coral-red. Voice. Generally noisy, calling semi-continuously when perched or in flight, and often making thin, shrill, nasal, and squeaky sounds; large flocks emit continuous shrill, nasal, chattering babble. Calls include variety of rather high-pitched, somewhat weak, nasal but sharp, staccato "nyurk" and "nurrit" notes, often quickly repeated and subdued in more conversational versions, occasionally interspersed with nasal downslurred squealing mews, "nyeeer", or upslurred "hwiiii", these sometimes doubled. Short nasal "nyerk", "nyer-wick" and "nyack" notes in flight. Songs, by solitary males repetitively from treetops, include shrill, very nasal, twangy "snyur-khwit, snyurt"; also clanging, squeaky, bell-like "skyurt-vee-yurt", first note screechy and nasal. Likely that regional differences exist.

Habitat. Broadleaf evergreen and mixed deciduous forest, groves, clearings and edges, visiting more open forest in winter. In Pakistan, typically associated in breeding season with oak (*Quercus incana*) and pine (*Pinus roxburghi*) forest; in much of breeding range, prefers tall broken forests of oak, pine and rhododendron, sometimes entering mature gardens; usually in mid-montane zone at 600–2100 m, rarely to 3200 m, and breeding at lower foothills in only a few locations (e.g. Royal Chitwan National Park, in Nepal). Outside breeding season, occurs in evergreen and mixed deciduous lowland forests, montane forest and secondary growth, on slopes at all elevations, mainly above 500 m; wanders sporadically to plains (down to c. 100 m) in response to bad weather or fruiting events; vagrants recorded close to sea-level.

Food and Feeding. Diet mainly berries and other fruits, also flower nectar and insects. In Pakistan, thought to subsist largely on berries of *Viburnum foetens* and other shrubs during winter, but largely insectivorous in breeding season; in N Pakistan and Kashmir, berries of "Persian lilac" (*Melia azedarach*) a staple food, along with figs (*Ficus religiosa* and *F. bengalensis*). Figs (including *F. nitida*) make up a large part of the diet in Hainan and Taiwan. In N Myanmar, birds (of both white-headed and black-headed races) were seen to feed on fruits and flowers of, among others, *Prunus*, *Ficus*, *Callicarpa arborea*, *Embelia*, *Maesa*, *Heptapleurum*, *Leucospectrum*, and on insects attracted to these; *Leucospectrum* (especially its nectar) was apparently a very common foodplant. Individuals or groups regularly gather at flowering trees or shrubs to eat nectar, e.g. at rhododendrons (in Himalayas) and at trees such as *Cassia*, *Bombax* and *Salmalia malabarica*; in Himalayan spring, seen to eat deciduous leaf and flower buds. Well known as a skilled catcher of insects, especially in aerial sallies from treetops. Seems to favour beetles (Coleoptera), but one observed to catch and consume a large green mantid in Pakistan, and others seen catching hymenopterans or dipterans attracted to large flowers such as *Butea monosperma* or *Rhododendron arboreum*. Gregarious. In non-breeding season, can gather in large flocks of up to 100 individuals, sometimes several hundreds; at this time white-headed races sometimes mix freely with black-headed ones, but the two usually keep to separate flocks. Usually forages in upper branches of tall trees, often perching directly on top of canopy; rarely descends to undergrowth and never to ground.

Breeding. Breeds Apr–Jul. Nest a neat shallow cup, described variously as flimsy and as relatively large and robust, made of roots, twigs, bamboo leaves and bark, covered and fastened together with cobweb, interwoven with pieces of moss and leaves, lined with fine material such as coarse grass stems, bark shavings, pine needles, mammalian hair and the like; nest material depends on habitat, in Kashmir (*psaroides*) usually a foundation of dead leaves and dried grass, walls of stalks and twigs well plastered with spider webs, sometimes much moss used, and in Taiwan (*nigerrimus*) constructed from bamboo leaves and twigs, covered on outside with moss and spider webs, lined with pine needles and very fine stems and leaf stalks; placed on bough or in fork of bush or tree, including conifer, 2–15 m above ground but usually fairly high (7–10 m), most nests slung between two slender branches that fork horizontally, often near end of horizontal branch, a small minority lodged in upright fork; reported tendency to nest in single tree narrowly isolated from forest. Clutch 2–3 eggs, rarely 4–5; incubation mostly (probably entirely) by female, male sings near nest for much of day; no information on incubation and nestling periods.

Movements. Some races resident, others migratory. Migration patterns complex; species usually erratic in occurrence, depending on food supplies, even where essentially resident (e.g. N Thailand). White-headed races (nominate, *leucothorax*, *stresemanni*) generally migratory, probably travel greatest distances; common non-breeding visitors to NE Myanmar, and unknown races occur in winter S to N Thailand and sometimes farther S (*leucothorax* a vagrant in S Thailand); one record for Bangladesh, thought to have involved *stresemanni*. In Laos, numbers of resident black-headed race (*concolor*) augmented by influx of black-headed and white-headed winter visitors (the latter more common); both types have been recorded in small numbers in Cambodia in winter. Individual of unknown race has occurred in N Peninsular Malaysia. White-headed individuals seen during summer on Taungyi crag, in Shan States of Myanmar, prompting suggestion that they may breed that far S, but this seems unlikely. Tends to migrate back to breeding quarters in Mar–May. In addition, seasonal altitudinal migrations undertaken in N Pakistan, Kashmir, Himachal Pradesh and elsewhere in Himalayas, some individuals moving farther afield, into plains of Pakistan and India.

Status and Conservation. Not globally threatened. Generally fairly common to very common. Race *psaroides* fairly common in N Pakistan, N India and much of Nepal; *perniger* common on Hainan; white-headed races common in parts of China. This species' tolerance of degraded habitats suggests that deforestation poses no serious threat to its future survival.

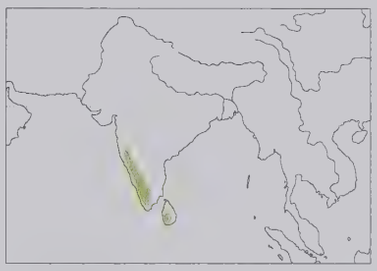
Bibliography. Ali & Ripley (1996), Ali *et al.* (1996), Bailey (1915), Bates & Lowther (1952), Caldwell & Caldwell (1931), Carey *et al.* (2001), Chang James Wanfu (1993), Cheng Tsohsin (1987), Cock & Marshall (1873), Collar (2004c), Cook (1912), Currie (1916), Daltry & Momberg (2000), Davidson (1998), Deignan (1945), Delacour & Jabouille (1931), Dickinson & Dekker (2002b), Dickinson *et al.* (2002b), Duckworth & Hedges (1998), Duckworth, Salter & Khounboline (1999), Étchécopar & Hüe (1983), Fulton (1904), Grimmett *et al.* (1998), Harington (1909a), Hingston (1921), Hopwood (1912), Hüe & Étchécopar (1970), Hume (1872–1873, 1888), Hume & Davison (1878), Inskipp & Inskipp (1991), Inskipp *et al.* (2000), Jones (1919), King *et al.* (2001), La Touche (1898), Lekagul & Round (1991), Lewthwaite (1996), MacKinnon & Phillipps (2000), Magrath (1908, 1909), Mahabal (1992), Mayr (1942), Mears & Oates (1907), Medway & Wells (1976), Meyer de Schauensee (1984), Paludan (1959), Perreau (1910), Prater (1923), Rattray (1905), Riley (1938), Rippon (1901), Roberts (1992), Robinson & Kloss (1919a), Robson (2000), Robson *et al.* (1998), Scully (1879), Smythies (1986), Stanford & Mayr (1940–1941), Stepanyan (1995), Stevens (1923–1925), Stuart Baker (1892–1893), Swinhoe (1863), Thompson & Johnson (2003), Ticehurst (1933), Traylor (1967), Ward (1906–1908), Webster (1975), Wells (2005), Whistler (1918), Whitehead (1910–1911), Wickham (1929–1930), Zheng Guangmei & Zhang Cizu (2002).

123. Square-tailed Black Bulbul

Hypsipetes ganeesa

French: Bulbul des Ghats **German**: Indien-Rotschnabelbülbül **Spanish**: Bulbul de los Ghats
Other common names: Black Bulbul (when treated as conspecific with *H. leucocephalus*)

Taxonomy. *Hypsipetes Ganeesa* Sykes, 1832, "Dense woods of the Ghats" = Mahabaleshwar, India.
Previously included within a broad *H. madagascariensis*. Usually treated as conspecific with *H. leucocephalus*, but marked differences in morphology and vocalizations indicate that the two are better considered separate species. Further, morphological distinctions between nominate race and *humii* minor, but vocal differences seem substantial; further study needed in order to determine whether two species involved. Two subspecies provisionally recognized.
Subspecies and Distribution.
H. g. ganeesa Sykes, 1832 – Western Ghats of India S from Bombay (including Shevaroys).
H. g. humii (Whistler & Kinnear, 1932) – Sri Lanka.



Descriptive notes. 21–24 cm. Large, noisy, conspicuous bulbul, appearing generally dark sooty grey, with very short crest, square-tipped tail. Has glossy black head, greenish sheen when plumage fresh; cheeks and ear-coverts slaty brown; upperparts dull bluish-slate, centres of back feathers especially dark; wings and tail dull brown, wing-coverts, secondaries, innermost primaries and base of rectrices edged bluish-ash; chin fairly dark; throat, chest and underparts faded slate-grey, palest on belly; undertail-coverts slaty brown with dark shafts and whitish edges; iris reddish, hazel, or orange with dusky tinge (sometimes slightly brownish); bill bright red, tinged orange; legs yellowish-red, claws blackish. Sexes alike. Juvenile is browner, paler below, flight-feathers and tail feathers fringed pale tawny, also has duller legs, yellowish-brown iris, blackish marks at bill tip and around nostril. Race *humii* is noticeably larger than nominate, also fractionally paler, with distinctly larger bill. Voice. Often calls from exposed treetop branches, or in flight, voice much harsher and less nasal than that of *H. leucocephalus*, but races differ considerably from each other; nominate has higher-pitched, harder, shriller vocalizations, those of *humii* noticeably lower and more guttural. Songs (nominate) include slow, high-pitched, strident, shrill "chur-chik-chik!" and similar variants with 2–5 notes, e.g. "chik!-chur-chik!"; also longer versions, sometimes with melodious, throaty, almost warbling notes, e.g. "kluk-kluk, takluk", and sharp "seep" notes appended. Songs of *humii* include steady, squawky, guttural strophes of chortling screeches, and longer versions with a few thinner more metallic notes admixed; also short raspy gurgles (e.g. "schurt, schew-pits"), sometimes with final note stressed (e.g. "skurt-skyewéé!"), first note quick and squawky, other two thin, squeaky and metallic. Calls include prolonged harsh mewing that descends only slightly; rapid, raspy, chuckling series, gradually slowing and becoming more strident; and harsh, often doubled "chyerk" notes, lower, harder and less nasal than those of *H. leucocephalus*.

Habitat. In India occurs in wide variety of forest types, including heavily degraded forests mixed with plantations; usually at 1000–2600 m, sometimes descending to 500 m when not breeding. In Sri Lanka, race *humii* occurs in similar habitats in Wet Zone lowlands and adjacent mid-altitude hills, to at least 1600 m; seasonally into Dry Zone or up to higher altitudes.

Food and Feeding. Fruits and seeds; berries include *Ziziphus*, *Eugenia*, *Vaccinium*; also insects. In S India, visits flowers of *Erythrina*, *Loranthus* and others, including introduced *Grevillea* and *Eucalyptus*, for nectar and insects. Often in mixed flocks (including species of *Zosterops*, *Sitta*, *Garrulax*, *Muscicapa* etc.), or in monospecific flocks of 20–30 (sometimes hundreds) in non-breeding season. Takes insects from foliage and branches; sometimes sallies after flying insects. Occasionally clings to large vertical trunks or branches.

Breeding. Feb–May and Jul–Sept in Sri Lanka and Mar–Jun in India; at least two broods. Nest in Sri Lanka described as a small and untidy cup, made of dead leaves, roots and mosses, lined with fine fibres, placed well up (usually 5–8 m) and fairly well concealed in forking branch of tree, apparently regularly in one narrowly isolated from main forest; nest in India small for size of bird, composed principally of moss, amply lined with fine grass and moss rootlets, placed against side of

On following pages: 124. Seychelles Black Bulbul (*Hypsipetes crassirostris*); 125. Reunion Black Bulbul (*Hypsipetes borbonicus*); 126. Mauritius Black Bulbul (*Hypsipetes olivaceus*); 127. Madagascar Black Bulbul (*Hypsipetes madagascariensis*); 128. Comoro Black Bulbul (*Hypsipetes parvirostris*); 129. White-headed Bulbul (*Cerasophila thompsoni*).

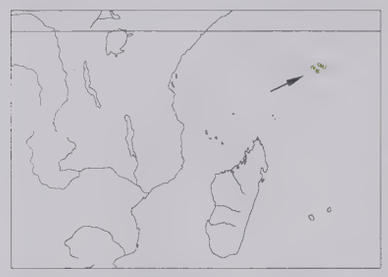
stout branch, supported by a few thin twigs, or in branches of dense parasitic plant in canopy of acacia (*Acacia*) or other tree. Clutch 2 eggs, sometimes 3; no information on incubation and nestling periods.
Movements. Essentially resident, although erratic wandering and regular altitudinal migration in India. Tends to vacate wettest slopes during heaviest of the SW monsoon (e.g. May–Oct, and especially Jul–Aug). In the Nilgiris (S Western Ghats) occupies higher altitudes in Mar–Jun, descends in Jul–Dec, and large scattered flocks of several thousands of individuals seen migrating in Jul; in same area, reported also as undertaking daily altitudinal movements in large numbers.
Status and Conservation. Not globally threatened. Common and conspicuous in much of Sri Lanka (especially at higher altitudes) and likewise in S portion of Western Ghats. Common in the Nilgiris, where it occurs in variety of reserves, and also in the Periyar National Park. An old record from C India (Berar) should be treated as provisional. This species' survival in small forest fragments, combined with its mobility, suggests that it is unlikely to be immediately threatened by deforestation.
Bibliography. Ali (1969), Ali & Ripley (1996), Barnes (1889), Betts (1931), Butler (1896), Davison (1883), Fairbank (1877), Ferguson & Bourdillon (1903–1904), Grimmett *et al.* (1998), Harrison (1999), Henry (1998a), Hume (1873c, 1876b), Jayson & Matthew (2000), Jones *et al.* (1998), Lainer (1999), Legge (1983), Lewis (1898), Raman (1999), Ranawana & Bambaradeniya (1998), Rasmussen & Anderton (2005), Ripley (1982), Taylor (1887), Whistler & Kinnear (1932), Zacharias & Gaston (1999).

124. Seychelles Black Bulbul

Hypsipetes crassirostris

French: Bulbul merle **German**: Dickschnabelbülbül **Spanish**: Bulbul Picogordo
Other common names: Seychelles/Thick-billed Bulbul

Taxonomy. *Hypsipetes crassirostris* E. Newton, 1867, Mahé, Seychelles Islands.
Sometimes considered to form a superspecies with all other members of genus, and in the past all have been treated as conspecific. Monotypic.
Distribution. Seychelles: Mahé, Praslin, La Digue and Silhouette, and a few neighbouring islands.



Descriptive notes. 24–25 cm; mean 79·5 g (estimated mean for male 83·2 g, for female 74·7 g). A large, chunky bulbul with conspicuous heavy bill, loose, pointed crown feathers often raised to form shaggy crest. Top of head black, slightly glossy; lores blackish, mottled olive-green, cheeks, ear-coverts and side of hindcrown from above rear of eye scaly olive; upperparts olive-brown, variably fringed olive-green (faintly mottled appearance); wings olive-brown, flight-feathers narrowly edged greenish; tail olive-brown, terminally fringed narrowly dirty white, fringes wider (c. 3 mm) on outer feathers than on inner and white extending some way up inner webs on outer feathers; throat and underparts paler olive, feather bases darker on chin and upper throat (appearing more scaly), fading to yellowish in centre of upper belly and undertail-covert feathers, yellowish-white on lower belly, lower flanks washed brownish; iris reddish-brown; bill bright orange; legs bright orange, dark yellow or yellowish-brown. Sexes alike, female on average smaller than male. Juvenile has flight-feathers chestnut, crown feathers fringed dark olive-green, eye yellow-brown, bill blackish and legs dark brown. Voice. Highly vocal. Song, usually by one member of pair from prominent perch, a series of clucks, squawks, whistles and chatters of variable structure and duration. Calls include a cluck, usually singly, sometimes repeated, given mostly immediately upon take-off, apparently as contact when moving between trees; a raucous, bleating "nyeer" ("cat call"), often at intervals of 5–10 seconds, usually by isolated bird separated from other group-members and frequently answered; and rapid "ak-ak-ak-ok-ok-ok" chatter, often lasting for more than 30 seconds, usually in chorus by pair, sometimes family group, often provoking similar response from neighbouring groups and thought to have territorial function. Juvenile may give soft "twee-twee-twee" as begging call.
Habitat. Woodland and forest, including secondary and introduced formations of almost all types. Found virtually wherever fruiting trees and bushes occur, including near habitation where cover present; rare in towns and in lowlands of Mahé, particularly in areas dominated by coconuts. At all altitudes; to 914 m on Morne Seychellois, the highest point in Seychelles.
Food and Feeding. Fruit, flowers, arthropods, bird eggs; possibly nectar. One study documented 22 species of hard and soft fruit, including native genera *Deckenia*, *Dillenia* and *Phoenicophorium* and exotic *Artocarpus*, *Ceiba*, *Cinnamomum*, *Ficus*, *Mangifera*, *Psidium*, *Rubus*. Athropods include mantids, cicadas (Cicadidae), caterpillars, hymenopteans (ants, wasps), orthopterans and spiders (Araneae). Gregarious, occurs in pairs, family groups or small parties; up to 15 may gather at fruiting trees. Forages mainly in crowns of trees and bushes, rarely in understorey. Gleans insects from branches and trunks, probes in leaf clusters; snatches large insects from branches or large leaves in swooping flight, and acrobatically catches winged insects in flight. Also pulls apart tangles of dead leaves, flying down to catch dislodged insects in mid-air; reluctant to retrieve from ground. Will descend to ground to eat contents of large fruit broken by fall. Aggressive, with frequent chasing.
Breeding. Recorded in Sept–Jan wet season, occasionally in other months; birds in breeding condition in Jul and mating in Sept. Territorial, territory defended against conspecifics and most other birds by pair or by group of three or more; role of additional individual(s), which often (but not always) immature, unclear, but during nest-building stage pair sometimes tolerates and feeds with a third bird, although latter does not approach nest. Nest built either by one member of pair, the other staying close by, or by both sexes in early stages and then by one, assumed to be female, which incorporates material brought by mate, construction takes 6–10 days; roughly circular, made of strips of grass up to 20 cm long, dead leaves in base and lower part of outer walls, palm fibres, small twigs, bark fragments, moss and pieces of creeper, lined with coarse fibres such as *Casuarina* needles, external diameter 13 cm, depth 8 cm, internal diameter 9 cm, cup depth 4–5 cm; mostly well above ground, to 15 m, once at 2 m, attached to support by cobwebs, usually in branch fork of forest tree, mostly large-leaved one (e.g. *Terminalia catappa*, *Tabebuia pallida*, *Sandoricum indicum*), but typically where no foliage and hence very exposed. Clutch 2 eggs, rarely 3; incubation mostly by female, some observations indicating that male may incubate for an hour or so each day, period c. 15 days; chicks brooded by both parents at least initially, nestling period 21 days; young reportedly fed by adults for one week after fledging, although other observations indicate that begging juveniles ignored or chased off. Likely that usually only one chick survives; in one study, 92 of 109 juveniles with parents in Sept–Oct were single young, although possibility of very rapid dispersal away from natal territory, perhaps by one sex, was not ruled out.
Movements. Sedentary. Three colour-ringed individuals observed very close to ringing site almost one year later; no movements of more than 200 m recorded.
Status and Conservation. Not globally threatened. Restricted-range species: present in Granitic Seychelles EBA. Generally common and widespread. Has adapted well to anthropogenic habitat modification. Occurs in several protected areas, including Praslin and Morne Seychellois National Parks and La Digue Special Reserve; estimated population in Praslin National Park and surrounding areas 200–500 pairs, in Mahé highlands and surrounding areas (including the national park) 1700–2300 pairs, on La Digue I 2000–4000 pairs and on Silhouette I 500–2700 pairs.
Bibliography. Bullock (1990), Cook (1978), Cresswell *et al.* (1997), Diamond, A.W. (1985), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Gaymer *et al.* (1969), Greig-Smith (1979a), Loustau-Lalanne (1962), Newton (1876), Penny (1974), Sinclair & Langrand (1998), Skerrett (1996), Skerrett *et al.* (2001), Stattersfield *et al.* (1998), Vesey-Fitzgerald (1940), Warren (2003).

125. Reunion Black Bulbul

Hypsipetes borbonicus

French: Bulbul de Bourbon **German**: Reunionbülbül **Spanish**: Bulbul de Reunión
Other common names: Reunion Bulbul/Merle

Taxonomy. [*Turdus*] *Borbonicus* J. R. Forster, 1781, Réunion Island.
Sometimes considered to form a superspecies with all other members of genus, and in the past all have been treated as conspecific. Was often thought to be conspecific with *H. olivaceus*, but differs in behaviour, voice and eye colour; treatment as a separate species supported by recent molecular studies. Monotypic.
Distribution. Réunion.



Descriptive notes. c. 22 cm; male 51 g, female 57·2 g, unsexed 43–56 g. A medium-large grey-brown bulbul with pale eye, long orange bill, and loose and erectile pointed crown feathers. Top of head is glossy black, sharply demarcated from nape and hindneck, which are greyish-olive with some browner streaking, lores black, cheeks, ear-coverts and side of hindcrown behind eye grey, ear-coverts with darker shaft streaking; upperparts dark greenish-olive, streaked brownish, rump washed cinnamon, tail dark olive-brown; wings olive-brown, secondaries and tertials fringed greenish-grey; chin black, throat and breast dark grey, flanks dull greenish-grey, upper belly yellowish-grey, lower belly dirty yellowish, lower flanks pale cinnamon, undertail-coverts dirty yellowish with cinnamon wash; iris white or creamy; bill and legs yellowish-orange. Sexes alike, female thought to be smaller on average than male. Juvenile has body plumage paler, primaries and tail feathers rusty. Voice. Four main types of vocalization recognized, a "chuckle", a "cat call", a stress "kek" and soft notes of pair contact; repertoire generally resembling that of *H. olivaceus* but differing in detail. Song, commonly in early morning and at intervals during day, often from high perch, loud, fairly short and monotonous, consists of various chuckle phrases strung together; shorter chuckle elements, sometimes combined with cat calls, often given by both members of pair, whether close to each other or some distance apart. Cat call (or "mew") a long drawn-out nasal, wheezy note, initially slightly ascending and then descending; "kek" seems to be given in situations of fear and aggression, as when being mobbed. Loud, ascending whistle also reported.
Habitat. Mixed evergreen forest, to lesser extent also degraded forest and native *Acacia heterophylla*-dominated forest, at 300–2500 m, occasionally as low as 100 m; below 1800 m only in patches of native mixed forest on slopes of ravines and canyons. Breeding largely confined to native forest, at 500–1800 m. Avoids heath vegetation, cultivated areas and gardens.
Food and Feeding. Mainly frugivorous; flowers, nectar and some insects also taken. Native fruits include, in particular, *Aphloia theiformis*, also *Acanthophoenix*, *Allophylus*, *Ficus*, mistletoe (Loranthaceae) and possibly *Sideroxylon*; introduced fruits such as guava (*Psidium guajava*) and strawberry guava (*P. cattleianum*). Flowers and buds of *Nuxia* and eucalyptus (*Eucalyptus*) are eaten, and nectar of latter also taken. Only few records of clumsy flycatching from a perch and equally maladroit "leap-snatching" of insects from trees; seems less insectivorous than are congeners in Malagasy Region. Occurs singly, in pairs or in small family groups; more than one pair may congregate at a food source, and at lower elevations forms noisy groups of 4–10 (usually 3–6) individuals, perhaps family parties. Forages mostly in middle strata, only rarely descending to the ground to collect fallen fruit. Generally silent, with occasional spells of interaction; very shy, flies off noisily when disturbed.
Breeding. Nesting recorded in Jul–Feb, coinciding with dry season and start of rains; recent fledglings in Feb and juvenile in Mar; possibly double-brooded. Nest an untidy cup, built of stems and leaves of ferns, mosses and rootlets, in small tree or bush. Clutch 2–3 eggs; no information on incubation and fledging periods.
Movements. Seasonal altitudinal migration recorded. Post-breeding movement to lower elevations in Feb–Aug, possibly in response to decreased food supply in upland forests during austral winter; returns to higher elevations to breed in Aug–Feb. Situation not clear, however, since movement to higher altitudes in Jul–Aug has been reported to be associated with ripening of fruit (in particular, the guava crop); corresponding movement down towards coastal areas in Dec–Mar, again reputedly to coincide with guava fruiting season. Some individuals found at high altitudes all year. Further study required.
Status and Conservation. Not globally threatened. Restricted-range species: present in Réunion EBA. Uncommon; most frequent in native mixed evergreen forest. Was considered "extraordinarily abundant" in the past, but numbers greatly reduced by hunting. In 1973–74, mean density estimated at 25 pairs/km² within breeding distribution of c. 1000 km², giving total population of c. 25,000 pairs; in 1980–81, however, much lower total of 20,500 individuals estimated. Until 1989 this species was officially classed as game, and could be legally hunted for about two months per year; it was widely shot outside this period, however, and was also caught illegally by liming. Now fully protected by law, and numbers thought to be increasing as a result. Appreciated as a songster; illegal capture for the local cagebird trade is the biggest current threat. Parts of its population are protected in La Roche Ecrite Nature Reserve and Grand Bénard Protected Biotope. Still very shy of humans, as a consequence of hunting.
Bibliography. Barré (1983), Barré *et al.* (1996), Berlioz (1946), Cheke (1987b), Cheke & Jones (1987), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Gregory (2000), Horne (1987), Newton (1876), Sargeant (1992), Sinclair & Langrand (1998), Stattersfield *et al.* (1998), Staub (1976), Warren (2003).

126. Mauritius Black Bulbul

Hypsipetes olivaceus

French: Bulbul de Maurice **German**: Mauritiusbülbül **Spanish**: Bulbul de Mauricio
Other common names: Mauritius Bulbul, Mauritius Merle

Taxonomy. *H[ypsipetes]. olivacea* Jardine and Selby, 1837, Mauritius.
Sometimes considered to form a superspecies with all other members of genus, and in the past all have been treated as conspecific. Was often thought to be conspecific with *H. borbonicus*, but differs in behaviour, voice and eye colour; treatment as a separate species supported by recent molecular studies, which also indicate that it is sister to *H. madagascariensis*. Monotypic.
Distribution. SW, C & SE Mauritius.



Descriptive notes. 25–27 cm; male 69 g, female 76 g, unsexed 70 g and 79 g. A large bulbul with conspicuous pinkish-orange bill, loose and pointed erectile crown feathers. Forehead is olive grey-green, streaked darker, crown and nape very dark olive-green to blackish, slightly glossy; lores blackish, cheeks, ear-coverts and side of hindcrown above mid-point of eye greenish olive-grey; hindneck dull olive grey-green, streaked darker, upperparts dark greenish-olive, streaked brownish, rump slightly browner and warmer; tail and wings olive-brown, secondaries and tertials narrowly fringed greenish-grey; throat, breast and flanks dull dark greenish-grey, belly yellowish-grey, rear flanks pale cinnamon, undertail-coverts dirty yellowish with brownish feather centres; iris dark red-brown; bill pinkish-yellow or orangey, usually darker distally on distal culmen and on cutting edges; legs yellowish-orange or pinkish. Sexes alike, female on average smaller than male. Juvenile moults soon after fledging, then resembles adult but very dingy greyish-brown (lacking bright chestnut remiges of young *H. crassirostris*), with dark, dull bare parts. Voice. At least four types of call recognized, a "chuckle", a "cat call", a stress "kek" and soft notes of pair contact, similar to repertoire of *H. borbonicus*. The chuckle, "chuck chuck", varies seasonally, sexually and with context, but forms basis of simple song, given morning and evening by territorial male, and used for recognition or greeting between pair-members, e.g. by female after a call sequence when rejoining mate or foraging group. Cat call a rather long, clearly defined, raucous "nyeer"; "kek" apparently given in situations of fear and aggression, as during interspecific and intraspecific interactions. Foraging pair utters soft, short chuckles, as do members of group at common food source, suggesting that pair-members maintain contact when in group; on rejoining after some time apart, both also chuckle jointly.
Habitat. Humid forest dominated by native trees, including areas where canopy broken or forest heavily invaded by exotic plants; also uses entirely exotic vegetation where favoured food plants occur, and may travel widely to visit such plants. Mainly between 200 m and 824 m (highest point of island), often lower, and occasionally at sea-level. Core of distribution coincides with upland wet forest, but lowland dry forest also used; exploits wooded valleys of S plateau (containing mostly exotic vegetation). Any area with native or favoured exotic trees over a large part of the S & C part of island may be visited occasionally, perhaps seasonally. Avoids native dwarf forest; generally absent from pine (*Pinus*) and eucalyptus (*Eucalyptus*) plantations.
Food and Feeding. Fruit, arthropods, small vertebrates; occasionally flowers and nectar. Diverse range of native and introduced fruits taken. Native species include *Aphloia*, *Calophyllum*, *Protium*, *Syzygium*, *Warneckia* and an unidentified palm; naturalized exotics include *Apodytes*, *Artocarpus*, *Flacourtia*, *Lantana*, *Ligustrum*, *Litsea*, *Melia*, *Michelia*, *Ossaea*, *Psidium* and *Rubus*. Also takes grapes, apples, papaya, mulberries, raspberries and cherries. Flower-feeding recorded on exotic *Ipomoea* and native *Nuxia*; one observation of nectar-feeding on exotic rose-apple (*Syzygium jambos*). Most animal items taken are arboreal insects: stick-insects (Phasmida), orthopterans (bush-crickets), cicadas (Cicadidae), lepidopterans (adults and caterpillars) and dragonflies (Odonata). Native diurnal geckoes (*Phelsuma*) account for 30% of animal items identified and may, because of large size, constitute a high proportion of biomass eaten. Usually found singly, in pairs, or in (probably family) groups; up to eight seen together. Strictly arboreal; extremely rarely collects food from ground. Animal prey caught by gleaning from leaf bases, twigs and branches, and clumsy flycatching; also crashes into dense foliage and sallies after small insects flushed. Larger items held in bill and immediately beaten against branches.
Breeding. Nesting recorded Nov–Feb; probably single-brooded. Monogamous. Co-operative breeding possible based on third bird feeding young at one nest. Traditional territory may be reclaimed from year to year, vigorously defended by both partners; male frequently gives aerial display to mate, using rapid, exaggerated wingbeats, with tail raised and slightly fanned, while giving a series of "chuckle" notes with head thrown back. Nest built by female (one nest only), a coarse cup made of twigs, coarse grass, leaves, roots(?), moss and lichens, lined with finer material, external diameter 13–23 cm, placed 2–9 m above ground on horizontal branch in low bush or tree, often Japanese red cedar (*Cryptomeria japonica*) where available; territory c. 1 ha around nest. Clutch 3 eggs, in one case completed in 4 days (first and second eggs laid 2 days apart); if clutch lost, repeat laid 8–9 days later in new nest; incubation, by presumed female only, 15–16 days; chicks brooded by presumed female only, fed by both parents, once also by third individual (probably immature?), nestling period 3 weeks; family-members may remain together once young feeding independently. Success poor; fledged broods of one, less often two, juveniles rarely seen; signs of failure consistent with attacks by introduced black rats (*Rattus rattus*) or crab-eating macaques (*Macaca fascicularis*).
Movements. Largely resident; often absent from breeding territories outside nesting season, and may appear in widely scattered localities.
Status and Conservation. VULNERABLE. Restricted-range species: present in Mauritius EBA. In 1993, population estimated at 280 (225–340) pairs in simple census, and total area of occupancy 78 km². Densities extremely low compared with other Malagasy members of genus; generally fewer than 10 pairs/km², possibly reaching 15 pairs/km² in few localities; home range up to 50 ha. Dependent on woody vegetation that provides fruit and animal food; such vegetation currently largely native, and long-term decline caused by destruction of this habitat. Main threat is continued habitat degradation resulting from spread of exotic plants poor in food. This species' populations may be limited by nest predation by non-native mammals and by resource competition with exotic birds, including Common Myna (*Acridotheres tristis*) and *Pycnonotus jocosus*, and mammals. Occurs in Black River Gorges National Park, as well as in number of nature reserves and mountain reserves, the latter aimed at watershed protection; some areas of critical habitat, however, are not included in any form of protected area. Introduced in Diego Garcia (Chagos Archipelago), but now extinct there.

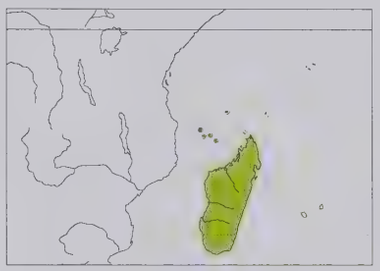
Bibliography. Butchart & Stattersfield (2004), Cheke (1987a), Cheke & Jones (1987), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Green & Hirons (1991), Guérin (1940), Horne (1987), Michel (1992), Newton, A. (1876), Newton, E. (1861), Newton, R. (1958), Nichols (1999), Safford (1994, 1996, 1997), Sargeant (1992), Sinclair & Langrand (1998), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Staub (1976, 1993), Warren (2003).

127. Madagascar Black Bulbul

Hypsipetes madagascariensis

French: Bulbul de Madagascar **Spanish**: Bulbul Malgache
German: Madagaskar-Rotschnabelbülbül
Other common names: Madagascar/Black Bulbul

Taxonomy. *Turdus Madagascariensis* Statius Muller, 1776, Madagascar.
Sometimes considered to form a superspecies with all other members of genus, and in the past all have been treated as conspecific. Recent molecular analysis indicates that present species and *H. olivaceus* are sister-taxa; also that populations of Madagascar and Comoros (nominate race) form a monophyletic group, sister to race *rostratus*. Birds from Grande Glorieuse I described as race *grotei*, largely on basis of putative differences in bill size and colour, but not satisfactorily distinguishable from nominate, as any slight differences appear to involve individual, not geographical, variation. Two subspecies recognized.
Subspecies and Distribution.
H. m. madagascariensis (Statius Muller, 1776) – Comoros (all four main islands and some islets), Glorieuse Archipelago (Grande Glorieuse I) and Madagascar.
H. m. rostratus (Ridgway, 1893) – Aldabra.



Descriptive notes. c. 24 cm; male 39–52 g, female 33–52 g. A medium-large, long-tailed, dark grey bulbul, pointed and loose crown feathers often raised to form shaggy crest. Nominate race has top of head and nape black with dark green wash, glossy; lores, preorbital area and narrow line extending back from rear of eye black, indistinct grey supercilium behind eye, dark grey cheeks and ear-coverts; many individuals have faint grey supraloral spot; upperparts dark slate-grey, shaft and centre of feathers brownish; tail dark grey-brown; wings dark brown, secondaries, tertials and greater wing-coverts narrowly fringed grey; chin often dark, throat and underparts dark grey, somewhat paler on flanks, pale grey-white in centre of belly, undertail-coverts grey with pale fringes; iris dark brown or dark red; bill orange, often with dark tip and distal part of culmen; legs dull horn, dull orange-brown, dull yellowish-orange or pinkish. Sexes alike, female on average smaller than male. Juvenile has crown feathers dull, not glossy black, intermixed brownish, back tinged brown, flight-feathers, wing-coverts and margins of tail feathers rusty. Race *rostratus* is longer-legged than nominate, black on head extends only to hindcrown (not nape), upperparts and flanks washed brownish, breast also washed brown, belly centre buffy with slight olive tinge. Voice. Highly vocal; calls varied but unmelodic. Common element a brief nasal, disyllabic, penetrating, downward-inflected "tireet" or "tyeeu", often by several individuals together (perched or in flight), and extended, sometimes with other notes, into conversational 3-note "tireet teetee tireet", "thci-churr-tchi" or "choo-chee chili". Also characteristic single nasal mewing (the "cat call" or "bleat"), "eeeee", "eee-ew", "nyeeea" or "meu", often hard to locate. Some inter-island variation in harmonic frequency of cat call noted in Comoros; birds on Mohéli have distinct song type (not noted elsewhere in Comoros), in which song is cut across with short, clear, abrupt whistled "tju"; Glorieuse population also reportedly exhibits some vocal differences from that on Madagascar. Race *rostratus* has similar repertoire, based on loud, clear "cheep" or "chip" sounds, commonly consisting of 2 notes, second lower than first, sometimes extending to 3 or 4 notes, the final two still lower in pitch; also rapid series ending in louder and higher single note, a harsh alarm call "yeeah", and a grating "keeeoo", resembling closely mewing call of nominate.
Habitat. Forest of all types, secondary growth, sparsely wooded savanna, orchards, plantations, scattered trees in agricultural fields, urban parks and around habitation. In primary forest in Madagascar, confined to edge habitats in some places, penetrates deep into forest interior in others; sea-level to 2500 m. In Comoros, commonest on Grand Comoro (Njazidja) in coastal areas but found to 700 m (occasionally 1000 m) on Mt Karthala and to 800–900 m on La Grille; to 400 m on Mohéli (Mwali), where also most abundant around coast; at higher altitudes on both islands replaced by *H. parvirostris*; on Anjouan (Ndzuani) and Mayotte (Maore), where *H. parvirostris* absent, found to 1100 m and summit (600 m), respectively. Occurs throughout Aldabra wherever trees and scrub present, but less common in mangrove.
Food and Feeding. Fruit, also flowers and seeds; also arthropods, including hymenopterans (ants, wasps), ant-lions (Myrmeleonidae), beetles (Coleoptera), bugs (Hemiptera), cicadas (Cicadidae), grasshoppers (Orthoptera), mantids, moths (Lepidoptera), spiders (Araneae). Fruit of native and introduced species taken, including *Bakerella*, *Capparis*, *Canthium*, *Celtis*, *Chassalia*, *Clidemia*, *Cordia*, *Dianella*, *Ficus*, *Medinilla*, *Melia*, *Neotina*, *Oncostemum*, *Pauridiantha*, *Rinoria*, *Vaccinium*; flowers including *Crateva*. On Aldabra, fruit includes *Apodytes*, *Asparagus*, *Flacourtia*, *Mystroxylon*, *Passiflora*, *Phyllanthus*, *Polysphaeria*, *Scaevola*, *Scutia*, *Solanum*, *Terminali*, *Ticalysia*, *Ricinus*, and recorded as feeding at flowers of *Agave*, *Erythrina* and *Lantana*. Conspicuous and noisy. Gregarious when not breeding; often perches high in trees in groups of up to 15 individuals; active. Often joins mixed-species flocks. Communal roosts reported in Comoros (Mayotte), sometimes with Common Mynas (*Acridotheres tristis*). Usually forages in crowns of trees and bushes; rarely in understorey, except in areas of contact with *H. parvirostris* on Grand Comoro and Mohéli (Comoros), where tends to keep low in vegetation, with its larger congener in the higher strata. Also picks fruit by hovering or in awkward fluttering flight. Gleans insects from leaves and twigs, catches others in flight in sometimes long aerial sallies. Occasionally feeds on ground on Aldabra.
Breeding. Nesting recorded in Sept–Jan in Madagascar and Sept–Nov in Comoros; breeds mainly Oct–Jan on Aldabra. Nest hemispherical, firmly but not densely constructed of small twigs, fine rootlets, flower stems, dried grass, moss and plant fragments, lined with fine grass and plant stems, bottom may be loosely woven (eggs visible from below), parts of cast reptile skins reported as sometimes incorporated into foundation, external diameter 10–12 cm, depth 6·5–7 cm, internal diameter 7 cm, cup depth 3–5 cm; placed 1–8 m above ground, usually low, sometimes at end of branch, once secured to four points of two adjacent branches with spider webs, on Aldabra 1–2 m up in fork of thorny shrub. Clutch 3 eggs, records of 2 on Anjouan (Comoros); no information on incubation and fledging periods.

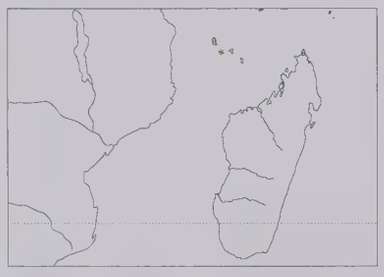
Movements. No information; presumed sedentary.
Status and Conservation. Not globally threatened. Common to very common. Common to abundant throughout much of Madagascar, where it has adapted well to deforestation; recorded mean densities of up to 2·7 birds/ha in Montagne d'Ambre, 117 birds/km² in Anjanaharibe-Sud, 270 birds/km² in Zahamena and 99–311/km² in Zombitse-Vohibasia. One of the three commonest bird species in the Comoros. Recently rediscovered on Grande Glorieuse, where had been reported as extinct; unclear whether earlier reports were incorrect or there has been a subsequent recolonization. Race *rostratus* widespread on Aldabra, where population estimated at 4000–8000 pairs; 19th-century records from nearby Cosmolédo and Astove may have referred to this race, but now extinct on those atolls. Present in a large number of protected areas on Madagascar; occurs in a number of reserves on Mayotte, but no protected areas exist in the Union of the Comoros. Aldabra Atoll is a nature reserve and World Heritage Site.
Bibliography. Albignac (1970), Bendire (1894), Benson (1960, 1967), Benson & Penny (1971), Benson, Beamish *et al.* (1975), Benson, Colebrook-Robjent & Williams (1976), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Forbes-Watson (1969), Frith (1979), Gaymer (1967), Goodman & Benstead (2003), Goodman & Parillo (1997), Goodman & Puttnam (1997), Goodman, Andrianarimisa *et al.* (1996), Goodman, Hawkins & Razafimahaimodison (2000), Goodman, Pidgeon *et al.* (1997), Hawkins (1995), Hawkins & Goodman (1999), Hawkins *et al.* (1998), Herremans (1988), Langrand (1990, 1995), Louette (1988, 1999, 2004, 2005), Louette & Herremans (1985), Louette, Bijnens *et al.* (1989), Louette, Stevens *et al.* (1988), Milon *et al.* (1973), Morris & Hawkins (1998), Mustoe *et al.* (2000), Newton (1876), Penny (1974), Probst *et al.* (2001), Rand (1936), Safford & Duckworth (1990), Sinclair & Langrand (1998), Skerrett (1996), Skerrett *et al.* (2001), Stevens & Louette (1999), Thompson & Evans (1991), Thompson *et al.* (1987), Warren (2003).

128. **Comoro Black Bulbul**

Hypsipetes parvirostris

French: Bulbul des Comores **Spanish**: Bulbul de Comores
German: Komoren-Rotschnabelbülbül
Other common names: Comoro Bulbul

Taxonomy. *Hypsipetes parvirostris* Milne-Edwards and Oustalet, 1885, Grand Comoro, Comoro Islands.
Sometimes considered to form a superspecies with all other members of genus, and in the past all have been treated as conspecific. Presence of two species of this genus in Comoros has long been contentious; significance of the olivaceous phenotypes restricted to Grand Comoro and Mohéli obscured by presence on all four main islands of *H. madagascariensis*. Shortly after its initial description, nominate race became treated as a hybrid between *H. madagascariensis* and *H. crassirostris*; subsequently, all Comoros forms considered sufficiently distinct in combination from Madagascar populations to merit subspecific rank, for which name *parvirostris* was used (despite the fact that the type was the supposedly "aberrant" olivaceous form); the larger olivaceous *moheliensis* was originally described as a race of *H. crassirostris*. It is now recognized that the olivaceous phenotype constitutes a separate species, which behaves as a parapatric vicariant of *H. madagascariensis* (replacing latter in montane forest habitats). Furthermore, recent molecular analysis suggests that *moheliensis* is not the sister-taxon of nominate and that it should be accorded rank of full species, a treatment supported by differences in size and vocalizations; retained as race of present species, pending fuller study of the two taxa. Two subspecies provisionally recognized.
Subspecies and Distribution.
H. p. parvirostris Milne-Edwards & Oustalet, 1885 – La Grille and Mt Karthala on Grand Comoro (Njazidja), in N Comoro Is.
H. p. moheliensis (Benson, 1960) – Mohéli (Mwali), in C Comoros.



Descriptive notes. c. 25 cm; mean 56·9 g (nominate), 62·1 g (*moheliensis*). Large, olive bulbul, loose and pointed feathers of crown and nape often raised to form shaggy crest. Nominate race has top of head, nape and upper hindneck blackish, slightly glossy, with indistinct paler shaft streaking; lores blackish, mixed dark olive-green, cheeks, ear-coverts and side of hindcrown behind eye brownish olive-green; upperparts greenish-olive, feathers with variable amounts of brownish centrally, giving indistinctly mottled appearance; tail and wings olive-brown, flight-feathers and greater wing-coverts narrowly fringed greenish; throat, breast and flanks paler dirty yellowish olive-green, darkest on side of breast; belly pale dirty yellowish, undertail-coverts yellowish-white; iris chestnut-brown; bill dull orange; legs yellowish-brown or dull ochraceous brown. Differs from *H. madagascariensis* in larger size, proportionately shorter tarsi, and greenish or greenish-yellow (not grey) coloration, particularly ventrally. Sexes alike, female on average smaller than male. Juvenile is duller than adult, bill pale brown, with primaries, secondaries, alula and edges of wing-coverts and tail feathers rusty, some pale feathers on sides of head and neck. Race *moheliensis* is larger than nominate, with heavier bill, has belly dark like breast, vent and undertail-coverts with only a little yellow. Voice. Repertoire resembles those of congenerics in the region. Song of nominate an extended series of monotonous, loud nasal cacklings of limited variety, e.g. "swok-swuk-tchik-tchuk-waa-waa-tchuk-tchak-tchuk-tchik", with occasional short pauses between each series, speed and intensity of delivery varies, when more excited becomes higher-pitched "chewdly-cheoo-ch-ch–chewdly-chu-chewchu-chew-chu-chew"; main "cat call" a penetrating, nasal whine, "swaaaay" or "waaa". Vocalizations of race *moheliensis* similar in structure but slower, song somewhat lower-pitched and purer-toned, each element delivered in strident, measured, emphatic way, "tyo, tyu, tyo, tyu, tyo, tya, tyo, tyoo", somewhat reminiscent of *Nicator*, also may become more excited and faster "chack-chuck-chuck-chock-chuk"; call "thwaa thwaa", more strident and wheezing than that of *H. madagascariensis*.
Habitat. On Grand Comoro confined to natural forests, including clearings and associated degraded areas, on peaks of La Grille and Mt Karthala at 500–1850 m (limits of forest), but less frequent above 1000 m; associated with mature forest, pioneer forest on lava flows, forest underplanted with banana and taro, less frequent in logged forest in which structure has been destroyed. On Mohéli (*moheliensis*) in forests of central ridge, mainly above 200–400 m, to 790 m. On both islands replaces *H. madagascariensis* at higher altitudes, the two overlapping at 500–750 m on Mt Karthala, extensively at same altitudes on La Grille, and at 200–500 m on Mohéli.
Food and Feeding. Little information. Berries and other fruit, including exotic *Rubus rosifolius*, and insects. Gregarious, in noisy groups. Nominate race forages mainly in upper strata and crowns of trees; *moheliensis* much more in understorey.
Breeding. Fledglings seen in Nov on Grand Comoro. Nest (of nominate) a thick, firm cup of mosses, ferns, dead leaves and stems, larger than that of *H. madagascariensis*, built in fork of bush. No other information.
Movements. No information; likely sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Comoro Islands EBA. Both races considered to be common or very common within remaining limited forest habitat; until recently, status was obscured by taxonomic confusion and identification problems. Forests on both islands lack any formal protection, and are threatened with clearance for agriculture. Continuing forest loss would potentially threaten this species, as it seems unable to adapt well to heavily modified habitat, or is outcompeted, at least at lower altitudes, by *H. madagascariensis*.
Bibliography. Benson (1960), Cheke & Diamond (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Herremans (1988, 2001), Louette (1988, 2004, 2005), Louette & Herremans (1985), Louette & Stevens (1992), Louette, Bijnens *et al.* (1989), Louette, Stevens *et al.* (1988), Milne-Edwards & Oustalet (1888), Safford & Evans (1992), Sinclair & Langrand (1998), Stattersfield *et al.* (1998), Stevens *et al.* (1995), Warren (2003).

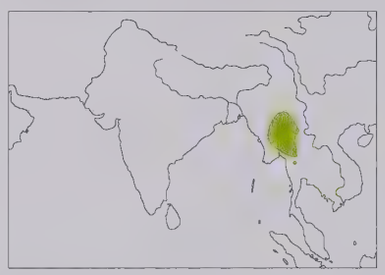
Genus *CERASOPHILA* Bingham, 1900

129. **White-headed Bulbul**

Cerasophila thompsoni

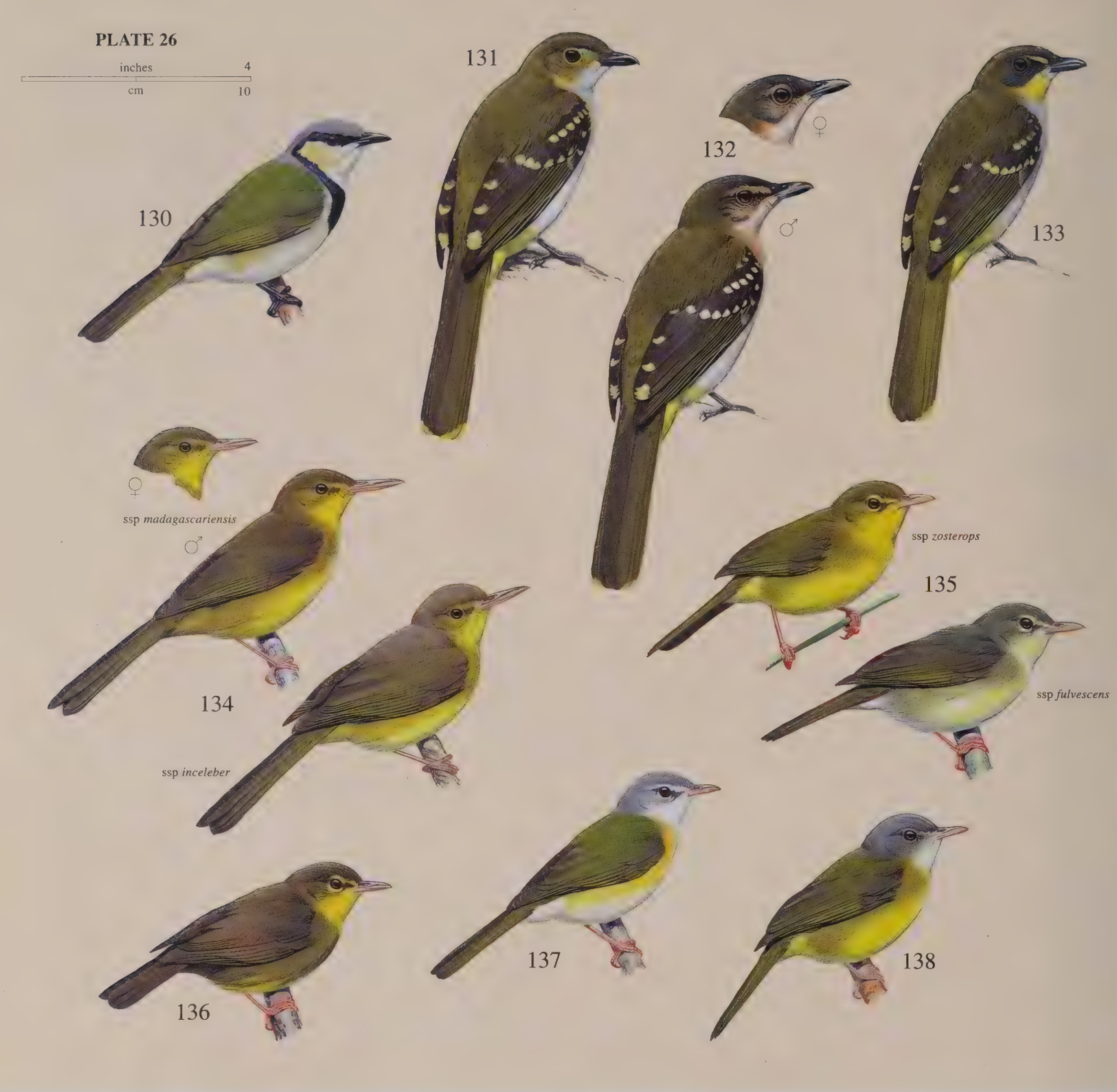
French: Bulbul à tête blanche **German**: Thompsonbülbül **Spanish**: Bulbul Cabeciblanco
Other common names: Bingham's (White-headed)/Brown-vented Bulbul

Taxonomy. *Cerasophila Thompsoni* Bingham, 1900, Southern Shan States, Myanmar.
Often included in an expanded genus *Hypsipetes*. Monotypic.
Distribution. N, C, E & S Myanmar (Bhamo district S to N Tenasserim) and W & NW Thailand.



Descriptive notes. 20 cm; 42 g. Distinctive, medium-sized bulbul. Entire head, upper neck and throat are pure white, apart from thin black loral streak extending around upper side of eye as partial black eyering; upperparts uniform pale smoky grey; wings and tail mid-grey, fringed paler ashy grey; upper breast to lower belly pale smoky grey (as upperparts), vent and undertail-coverts conspicuously rufous-chestnut; iris light yellow or brownish-yellow, edge of eyelid bright vermilion or orange-red (narrow patch of darker bare skin around eyering); bill coral-red, tip paler yellow or horn; legs coral-red, claws horny brown or brown with orange tinge. Distinguished from similar white-headed races of *Hypsipetes leucocephalus* by smaller body and bill, lack of shaggy crown and throat feathers, paler plumage, richly coloured undertail-coverts. Sexes alike. Juvenile is browner overall, with olive-buff edgings of grey feathers, head initially brownish-grey, darkest on crown side, gradually turning white. Voice. Singles or pairs generally silent unless singing, but flocks can be noisy. Song of variable short squeaky phrases, including rhythmic "chit-chirui chit-chiriu"; calls generally harsher and more buzzing than equivalent notes of *H. leucocephalus*.
Habitat. Forest edges, secondary forest, lightly wooded country, poppy gardens, park-like areas of scrub or grass with widely spaced pines (*Pinus*) or other trees. Usually at 900–2135 m; straggles to lower altitudes in non-breeding season, once down to 150 m.
Food and Feeding. Diet little known; one stomach from N Thailand contained only insects. Forages in loose flocks of up to 20 individuals; restless arboreal habits, as *H. leucocephalus*. Often perches openly on dead trees, and flies at considerable heights over open areas.
Breeding. Mar–Jul in N Thailand. Nest (in Myanmar) a fairly shallow cup built of grass seed-stems (possibly of *Saccharum arundinaceum*), grass and bamboo leaves, and hidden 1–2 m up in low bank, sometimes in pronounced recess; one was made of coarse grass, lined with fine grass, attached to stems of a plant just above ground on steep cleared slope. Clutch 2–4 eggs; no information on incubation and fledging periods.
Movements. Generally resident. Some evidence of post-breeding downslope movement; arrives in numbers in winter months in N Thailand.
Status and Conservation. Not globally threatened. Locally fairly common in its relatively small range; e.g. common in Karen Hills, in Myanmar. Quite common in N Thailand during winter months, at which time protected areas such as Doi Inthanon National Park support important populations.
Bibliography. Bingham (1903), Deignan (1945), Dickinson *et al.* (2002b), Gregory (2000), Lekagul & Round (1991), Mackenzie (1929), Prater (1923), Riley (1938), Rippon (1901), Robson (2000), Round (1988), Smythies (1986), Wickham (1924, 1929–1930).

PLATE 26 ➤



Genus *NEOLESTES* Cabanis, 1875

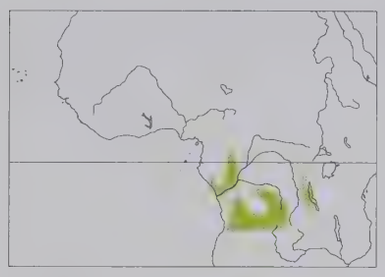
130. Black-collared Bulbul

Neolestes torquatus

French: Bulbul à collier noir **German**: Rüttelbülbül **Spanish**: Bulbul Acollarado

Taxonomy. *Neolestes torquatus* Cabanis, 1875, Chinchoxo, Angola.
Has often been placed with the bush-shrikes (Malaconotidae) or the helmet-shrikes (Prionopidae) because of obvious similarities in plumage colour and pattern, or considered of uncertain position. Recent skeletal and molecular studies indicate that this species is best placed within present family; phylogenetic analysis suggests that it is basal to other bulbuls within a monophyletic clade. Monotypic.

Distribution. Extreme S & SE Gabon and C & S PRCongo S to NW & N Angola (Cabinda, and S to Huambo and Moxico), SC & E DRCongo (including, in E, Idjwi I and from near Mt Kabobo S to Marungu Highlands) and extreme NW Zambia.
Descriptive notes. c. 16 cm; male 20–23·5 g, female 20–27 g. A handsome, unmistakable, shrike-like bulbul. Has forehead to neck grey, broad glossy black band from lores and around eye onto ear-coverts, then extending down side of neck and broadening across upper breast to form gorget; upperparts olive-green, tail feathers dark brown, edged olive-green, wings bright olive-green, edges of flight-feathers more yellowish-green, bend of wing yellow; chin, throat and cheeks creamy white, ear-coverts buffy, lower breast buffy white, breast side and flanks washed greyish, lower flanks tinged olive-green; iris dark brown; bill greenish-black or dark olive-green; legs black. Sexes alike, no sexual dimorphism in size. Juvenile is duller, top of head greenish, some mantle feathers with pale edges, olive-brown scapulars and upperwing-coverts tipped buff (forming pale barring across greater and median coverts), breastband dull. Voice. Song a rapid subdued babble, somewhat resembling that of *Pycnonotus barbatus* but phrases more mellow and fluid. Call notes "twee-dududu", "tji-li-li" and "dee-de-de-de-de", and softer nasal trill; twittering notes when foraging.



Habitat. Wooded grassland with 20–30% bush cover (mainly *Annona senegalensis* and *Hymenocardia acida*); prefers dense grassland 1–2 m tall, often of *Hyparrhenia*. Also secondary miombo woodland scrub, overgrown cultivation, termitarium thicket and *Lantana* thicket. Sea-level to 1750 m; rarely, to 2060 m in E DRCongo (Marungu).
Food and Feeding. Mainly insectivorous but also some fruit. Occurs singly, in pairs, or in groups of up to four individuals (thought to be family parties). Perches boldly on bare branches or fence posts. Hawks insects in the air; also drops into grass to take them. Active and restless, quickly working through an area.
Breeding. Nesting recorded in Aug–Oct and Dec–Jan (juveniles Dec–Feb) in DRCongo and Oct and Jan in Zambia; birds in breeding condition in Jul and Oct–Dec and fledgling in Mar in Angola. Solitary breeder, territorial, territories well spaced. As possible breeding display, a bird darted up into air in short jerky flight with noisy wingbeats for c. 30 m, remained there for several minutes before descending rapidly and jerkily, performance accompanied by continuous chattering. Nest a frail, untidy, unlined transparent cup made of thin layers of fine, dry grass, with or without a few plant stems, and with many gaps, external diameter 7·5–8·5 cm, internal diameter 5·5–6·5 cm, cup depth 4 cm, placed c. 1 m above ground in fork of 1·5 m-tall bush in open area of grass and scattered bushes outside miombo scrub; another was built in *Combretum* bush. Clutch 2 eggs; no information on incubation period; chicks fed by both parents, visiting nest together at intervals of up to 30 minutes; young leave nest by day 17, attended by parents in adjacent bush.
Movements. Little information; probably resident.
Status and Conservation. Not globally threatened. Generally considered common. Estimated density in Odzala National Park, in PRCongo, 4–5 pairs/km². Occurs in a number of protected areas, including Odzala National Park, Conkouati Reserve and Lefini Faunal Reserve, in PRCongo, and Lekoni National Park, in Gabon.
Bibliography. Bannerman (1939), Benson *et al.* (1971), Borrow & Demey (2001), Bowen (1983), Chapin (1921, 1953), Chappuis (1975), van Daele (1999), Dean (2000), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett & Prigogine (1974), Dowsett, Aspinwall & Dowsett-Lemaire (2004), Dowsett, Olson *et al.* (1999), Dowsett-Lemaire & Dowsett (1991), Fry *et al.* (2000), Hall & Moreau (1970), Lippens & Wille (1976), Mackworth-Praed & Grant (1960, 1963, 1973), Rand *et al.* (1959), Salvan (1972).

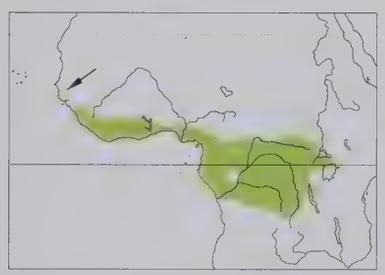
Genus *NICATOR* Hartlaub & Finsch, 1870

131. **Western Nicator**

Nicator chloris

French: Bulbul nicator **German**: Graukehlnicator **Spanish**: Conquistador Occidental
Other common names: Yellow-spotted/Common Nicator

Taxonomy. *Lanius chloris* Valenciennes, 1826, Galam, Senegal.
Systematic position of genus long a subject of debate. Traditionally classified within a broad family Laniidae on basis of similarities in coloration and bill morphology, and has at different times been placed with the Malaconotidae (formerly part of Laniidae) and with present family, depending on varying interpretations of the significance of different morphological characters. Analyses of feather proteins and early studies of DNA–DNA hybridization both favoured placement in present family, but genus appears unique in a number of morphological and other features (including nest structure). Recent DNA studies suggest that it is not closely related to any other group, and that it appears to represent a separate, monogeneric family. For convenience, retained within present family pending further investigation. Present species forms a superspecies with *N. gularis*, and often considered conspecific. Monotypic.
Distribution. Senegambia and S Guinea E to extreme S Sudan (Imatong Mts) and E Uganda, S to N Angola and S DRCongo, also extreme NW & W Tanzania.



Descriptive notes. 20–23 cm; male 48–67 g, female 32–51 g. Distinctive, shrike-like bulbul with relatively heavy hooked bill, conspicuous yellow spotting on wings, feathering of lores and preorbital area stiff, short and upward-pointing. Plumage is dark olive-green above, rump and uppertail-coverts more yellowish-green; tail dark green, edges tinged yellowish, tips of all except central pair also yellowish, widening from c. 1 mm on second pair (T2) to c. 10 mm on outer edge of outermost (T6); stiff feathers closest to bill and extending onto crown side black, forming dorsal edge of supraloral streak, those beneath and nearer eye pure white (a few with black tips); row of black preorbital bristles around leading edge of eye, extending in arc from beneath supraloral streak to above rear of gape; wings dark brown, outer primaries with narrow bright yellow edges, outer edges of inner primaries, secondaries and tertials olive-green, inner secondaries and tertials with large yellow terminal spot on outer web, remaining secondaries with narrow yellow tips; primary coverts with greenish outer edge and yellow tip, secondary coverts with large yellow terminal spot (three rows of contrasting yellow spots across upperwing-coverts); throat grey, yellow at side, breast grey, greener on side, flanks greyish-white, centre of belly off-white, thighs greenish-yellow, undertail-coverts bright yellow, underwing-coverts and axillaries yellow; iris brown, grey-brown or chestnut-brown, orbital ring and gape dull yellow; bill black; legs blue-grey. Differs from very similar *N. gularis* in more olive-green (less grey) crown. Sexes similar, female on average much smaller than male. Juvenile is slightly paler above, lower breast and belly pure white. Voice. Song powerful, melodious and very varied, comprising explosive crescendo of clear whistles, guttural rattles, etc., likened by some to that of Common Nightingale (*Luscinia megarhynchos*), typically begins with churring notes and ends with pure ones, "tuk-tutuk-turrr-wick", "tuk-tichur-ti-weety-weety-wok", "wee-tip-chup chorra chorra chorra"; sometimes launches straight into whistles, e.g. "weeoo chopa" or "wop-wop-cheep-cheep woja"; sometimes no pure whistles, as "chup-chup-chup-chup" ending with shrike-like, descending "teeurrrrr". Will mimic other species, including Sjöstedt's Owlet (*Glaucidium sjostedti*), African Pied Hornbill (*Tockus fasciatus*) and Yellow-bellied Wattle-eye (*Diaphorophyia concreta*), as well as *N. vireo*. Common call a loud "chuk" or "chok", also longer, more subdued series of dry "tuk" notes at irregular intervals, and loud, insistent "gwa-gwa-gwa-gwa"; contact call a series of clicks.
Habitat. Primary and secondary evergreen and semi-deciduous forest, swamp-forest, gallery forest, and areas of dense shrubbery in savanna zone; in secondary situations such as logged forest and shaded cacao plantations, along logging roads and beside watercourses. Infrequent or absent in closed-canopy forest with open understorey. Mainly lowlands, but also in forests up to 1400–1500 m, exceptionally to 1800 m.
Food and Feeding. Arthropods, including large orthopterans, mantids, beetles (Coleoptera), caterpillars; also vertebrates such as small frogs; a few berries and seeds. Occurs in pairs, but partners often forage some distance apart; sometimes joins mixed-species flocks. Works slowly and methodically through dense undergrowth and more open vegetation; inquisitive but skulking. Explores tangled lianes, bunches of dead leaves, epiphytic vegetation on trunks and branches, thick regrowth in treefall gaps and similar places, mainly in understorey and middle strata at 5–25 m; occasionally down to ground level. Spread rectrices laterally when foraging; flicks wings and pumps tail when excited.
Breeding. Nesting recorded in Apr in Sierra Leone, Feb and Nov (immatures Feb, Apr, Jul–Aug) in Liberia and Dec in Ivory Coast; Jun (breeding condition Mar, May, also dependent young Oct) in Nigeria, Apr–Jun and Aug in Cameroon; all year, peak during rains and short dry season, in Gabon, and May–Nov (breeding condition Feb, Apr, Dec) in DRCongo; Jul–Aug in Sudan and Apr and Jun–Jul in Uganda; birds in breeding condition in Jun in Central African Republic and Feb–Mar in Angola. Monogamous. Territorial; in aggressive situations, holds wings out from body and spreads tail while singing. Courting male seen to crouch silently on branch, spread wings and tail, hop several times and squat again. Nest small and rudimentary, 6 × 6 cm, built from a few sticks which support tendrils and rotting twigs, selected twigs in state of decomposition in order that fungus growing on them spreads across whole nest, so binding it together and to support, resulting structure appearing extremely fragile (many nests destroyed before mycelial growth sufficient to hold them together); placed 0·4–4·5 m above ground among leaves in undergrowth, sometimes in fork or on bundle of dead leaves hanging from branch; territory size 3–4 ha in PRCongo. Clutch 1 egg (nest too small to accommodate more); incubation by female only, period 17–18 days; chick fed by both parents (with relatively large prey) on average once every 30 minutes, leaves nest by 16–18 days, well before able to fly, moves into neighbouring branches; watched over by one parent, remains motionless, well camouflaged by its spotted appearance, when parent gives alarm call. Of 30 nests in Gabon, 17 produced flying young; four nests lost when blown down before fungal growth had secured structure.
Movements. Sedentary, at least in Gabon.
Status and Conservation. Not globally threatened. Generally common throughout its range. Present in numerous national parks, including those of Sapo, in Liberia, Taï Forest, in Ivory Coast, Kakum, in Ghana, Cross River, in Nigeria, Korup, in Cameroon, Lopé, in Gabon, Nouabalé-Ndoki, in PRCongo, Salonga, in DRCongo, Kibale Forest, in Uganda, and Mahali Mountain, in Tanzania.
Bibliography. Bannerman (1939), Barlow *et al.* (1997), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1976, 1986), Brown & Britton (1980), Carswell (1986), Chapin (1921, 1953), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1994), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Elgood *et al.* (1994), Fishpool & Evans (2001), Fishpool *et al.* (1994b), Fry *et al.* (2000), Gatter (1997), Gore (1990), Grimes (1987), Hall & Moreau (1970), Jackson & Sclater (1938), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Morel & Morel (1990), Nikolaus (1987, 1989), Prigogine (1971, 1978, 1984), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002), Thiollay (1985).

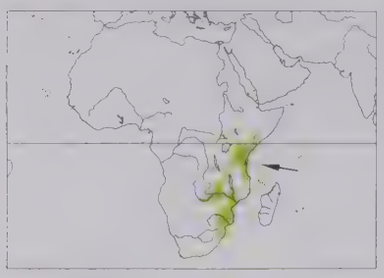
132. **White-throated Nicator**

Nicator gularis

French: Bulbul à tête brune **German**: Braunkopfnicator **Spanish**: Conquistador Oriental
Other common names: Eastern/Zambesi Nicator

Taxonomy. *Nicator gularis* Hartlaub and Finsch, 1870, Shupanga, Zambesi.
Systematic position of genus long a subject of debate. Traditionally classified within a broad family Laniidae on basis of similarities in coloration and bill morphology, and has at different times been placed with the Malaconotidae (formerly part of Laniidae) and with present family, depending on varying interpretations of the significance of different morphological characters. Analyses of feather proteins and early studies of DNA–DNA hybridization both favoured placement in present family, but genus appears unique in a number of morphological and other features (including nest structure). Recent DNA studies suggest that it is not closely related to any other group, and that it appears to represent a separate, monogeneric family. For convenience, retained within present family pending further investigation. Present species forms a superspecies with *N. chloris*, and often considered conspecific. Populations of Zambesi Valley (from Zambia E to C Mozambique) described as race *phyllophilus* on basis of paler browner forecrown, more greyish-yellow hindcrown and neck and brighter upperside, but differences from populations in rest of range slight, and considered insufficient to warrant naming of geographical races. Monotypic.
Distribution. S Somalia, SE Kenya, NE & E Tanzania (including Zanzibar, also scattered records farther W), S Zambia, parts of N, E & SE Zimbabwe, and much of Malawi and S Mozambique S to NE South Africa (KwaZulu-Natal) and E Swaziland; disjunct population in extreme SE DRCongo and adjacent NW Zambia.
Descriptive notes. 20–23 cm; male 40–63 g, female 29–41 g. Distinctive, shrike-like bulbul with relatively heavy hooked bill, conspicuous pale yellow spots on wings, feathering of lores and preorbital area stiff, short and upward-pointing. Top of head is olive-grey, upperparts dull olive-green; tail feathers greenish-brown, edged yellowish, tips of all except central pair also pale yellowish, widening from c. 1 mm on second pair (T2) to c. 7 mm on outer edge of outermost (T6); stiff feathers closest to bill and extending onto side of crown as the dorsal edge of supraloral streak

On following pages: 133. Yellow-throated Nicator (*Nicator vireo*); 134. Common Tetraka (*Bernieria madagascariensis*); 135. Short-billed Tetraka (*Xanthomixis zosterops*); 136. Dusky Tetraka (*Xanthomixis tenebrosus*); 137. Appert's Tetraka (*Xanthomixis apperti*); 138. Grey-crowned Tetraka (*Xanthomixis cinereiceps*).



are blackish, those beneath and nearer eye pale yellow; row of black preorbital bristles around leading edge of eye, extending in arc from beneath supraloral streak to above rear of gape; narrow pale yellow orbital ring; sparse feathering behind and below eye pale buffish-brown, becoming more olive-green on rear of ear-coverts; wings dark brown, outer primaries with narrow whitish edges, outer edges of inner primaries, secondaries and tertials greenish, inner secondaries and tertials with large pale yellow terminal spot on outer web, remaining secondaries with narrow yellow tip; primary coverts with narrow yellowish tip, greater and median secondary coverts with large yellowish white terminal spot (three rows of contrasting pale yellow spots across upperwing-coverts); throat buffish-white, upper breast greyish-brown, greener at side and becoming greyish-white on flanks and whitish on centre of belly; thighs pale greenish-yellow, undertail-coverts pale yellow; underwing-coverts and axillaries yellow; iris brown or yellowish-brown; bill horn, greyish-brown, blackish or pale grey, paler cutting edges; legs slate or pale blue-grey. Sexes similar, female on average much smaller. Juvenile has primaries yellow-tipped. Voice. Song, from high well-concealed perch, less frequently from exposed one, starts with a few low notes, "tik-chopweeoo-tok", followed by emphatic "trrr" and then loud, liquid whistling, e.g. "hip-to-wee-to-chip to-weet", "weeo wee, wee-ee-oo-chowee", "chip-chop-chipweooo-trrr… chip-to-weet" or "chwik, cheeerk, chwick, wherrreek, cho-chidilee", resembles that of *N. chloris*; duration c. 3 seconds, interval between songs may be filled with low conversational notes. Recorded as mimicking other species, including Moustached Green Tinkerbird (*Pogoniulus leucomystax*) and Eastern Black-headed Oriole (*Oriolus larvatus*). Alarm call a penetrating "tsuck" or "zokk"; also softer "tsuk-tsuk" and whistled "wee-oo".

Habitat. Coastal forest and lowland rainforest, riparian forest, evergreen and deciduous thickets, transition woodland, moist thornveld and coastal scrub; locally in second growth and suburban gardens. Mainly lowlands, occasionally reaching 1400 m in Malawi, 1550 m in Zambia, 1900 m in Kenya and 2150 m in Tanzania.

Food and Feeding. Arthropods, including large orthopterans, beetles (Coleoptera) and caterpillars. Occurs singly or in pairs; occasionally joins mixed-species flocks (reputedly females only; basis for this unclear). Secretive and inconspicuous when not calling, usually skulking in dense cover. Forages from ground level to canopy, usually in understorey, hopping unhurriedly from branch to branch, while looking about for prey; also actively searches in clumps of dried leaves. Also descends to ground level to work leaf litter, from where it takes prey up to a low branch to consume it. May flick wings while foraging, holding them half open and drooped. Seen also to fly silently and repeatedly in tight horizontal and oblique circuits close around base (at 0–2 m) of multi-stemmed low tree, while fanning tail and flirting wings (yellow spotting very conspicuous); this interpreted as behaviour intended to startle cryptic trunk-dwelling or hidden prey into movement, although none seen to be taken. Also follows small and large ungulates, feeding on insects flushed by their movement; occasionally perches on them to glean ticks, etc.

Breeding. Nesting recorded in Jun and Nov–Dec in Kenya and Tanzania, and birds in breeding condition Oct–May (from beginning of short rains until end of long rains) in coastal Tanzania; in Jan in Zambia, Dec–Jan in Malawi, Nov–Dec (also breeding condition Mar) in Mozambique, Jan in Zimbabwe, and Nov–Jan in South Africa. Monogamous. Solitary nester; territorial. Nest flat, rudimentary, a triangle of stout twigs supporting smaller twigs and tendrils, sometimes with rootlets, bamboo leaves, moss or stems and leaves of *Lantana* incorporated, the whole appearing too insubstantial to support the bird, external diameter 10–15 cm (outer edges very diffuse), cup diameter 7·5 cm; placed usually low down, c. 1 m above ground, in small bush of forest undergrowth, in tangle of dead branches, among stems of mat of creepers, or in forked branch of sapling, well concealed or sometimes exposed, once in full view 1·5 m from path in mass of thorns above large rock. Clutch 1–4 eggs, usually 2–3; incubation by female only; no information on incubation and nestling periods.

Movements. Thought to be sedentary.

Status and Conservation. Not globally threatened. Uncommon and locally common to common in different parts of range. Population in S Mozambique estimated to be at least 10,000 birds. Estimated densities in Swaziland 2·7 birds/100 ha in broadleaf woodland and 20 birds/100 ha in riverine forest; in most favoured habitats in Malawi, reaches 3–5 pairs/10 ha. Well represented in numerous protected areas, including Kruger National Park, in South Africa.

Bibliography. Ash & Miskell (1983, 1998), Benson & Benson (1977), Benson *et al.* (1971), Britton (1972, 1980), Brown & Britton (1980), Clancey (1964, 1996), Cordeiro (1994a), Dowsett & Dowsett-Lemaire (1980, 1993), Dowsett & Forbes-Watson (1993), Dowsett *et al.* (2004), Dowsett-Lemaire (1989), Dowsett-Lemaire & Dowsett (2004), Fry *et al.* (2000), Ginn *et al.* (1989), Hall & Moreau (1970), Hanmer (1978), Harrison *et al.* (1997), Irwin (1981), Jackson & Sclater (1938), Lewis & Pomeroy (1989), Lippens & Wille (1976), Long (1959), Mackworth-Praed & Grant (1960, 1963), Maclean (1993), Mlingwa (1996a), Monadjem (2002b, 2003), Moreau & Moreau (1937, 1939), Pakenham (1979), Parker (1999), Roche & Kilpin (2003), Stevenson & Fanshawe (2002), Tarboton (2001), Turner & Zimmerman (1979), Vernon & Dean (2005b), Zimmerman *et al.* (1996).

133. **Yellow-throated Nicator**

Nicator vireo

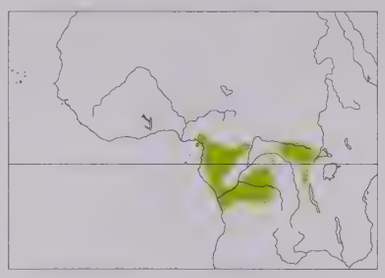
French: Bulbul à gorge jaune **German**: Gelbkehlnicator **Spanish**: Conquistador Gorgiamarillo

Taxonomy. *Nicator Vireo* Cabanis, 1876, Chinchoxo, Angola.

Systematic position of genus long a subject of debate. Traditionally classified within a broad family Laniidae on basis of similarities in coloration and bill morphology, and has at different times been placed with the Malaconotidae (formerly part of Laniidae) and with present family, depending on varying interpretations of the significance of different morphological characters. Analyses of feather proteins and early studies of DNA–DNA hybridization both favoured placement in present family, but genus appears unique in a number of morphological and other features (including nest structure). Recent DNA studies suggest that it is not closely related to any other group, and that it appears to represent a separate, monogeneric family. For convenience, retained within present family pending further investigation. Monotypic.

Distribution. W & S Cameroon, SW Central African Republic and N & W PRCongo S to N Angola, also W, SW, NE & E DRCongo and extreme W Uganda.

Descriptive notes. c. 16–18 cm; male 21–26 g, one female 23·5 g. Small, shrike-like bulbul with relatively heavy hooked bill, conspicuous yellow spots on wings, feathering of lores and preorbital area stiff, short and upward-pointing. Forehead and crown are greyish-olive, hindcrown and upperparts olive-green; tail paler and yellower green, tips of all except inner two feather pairs bold



yellowish, yellow widening from c. 1 mm on third pair (T3) to c. 6 mm on outer edge of outermost (T6); stiff feathers forming well-defined two-tone contrasting supraloral streak extending from base of bill to above eye, narrowly black above, wider bright yellow below; row of black preorbital bristles around leading edge of eye, extending in arc from beneath supraloral streak to above rear of gape; periorbital area, cheek and ear-coverts olive-grey; flight-feathers dark brown, narrowly fringed bright olive-green, inner secondaries and tertials with large yellow terminal spot; larger upperwing-coverts dark brown, primary coverts narrowly fringed yellow, greater and median coverts with large pale yellow terminal spot, lesser coverts dark green (two rows of contrasting yellow spots across upperwing-coverts); chin grey, throat and side of neck yellow or yellowish-green; breast and flanks grey, washed greenish laterally, belly greyish-white, thighs green, undertail-coverts yellow or greenish-yellow; underwing-coverts and axillaries yellow; iris brown or grey-brown; bill blackish or blackish-horn above, blue-grey or pale grey below; legs grey of blue-grey. Differs from *N. chloris* in smaller size, yellow throat, more extensive, yellow supraloral streak. Sexes alike, female on average smaller than male. Juvenile has forehead green, less yellow on throat. Voice. Song, from dense cover, a loud, far-carrying series of 8–11 resonant, explosive notes, "ko-kwee-ko-ko-ko-kwee-kuk-kuk" or "po-tyoo-ho-ho-ho-whee, tyoo-ho-ho", with some variations. Calls include angry "gwrrrrrr".

Habitat. Primary forest and old secondary forest, also abandoned cultivation and beside logging roads once regrowth sufficiently dense; also forest remnants in coffee plantations. Lowlands; reaches 870 m in DRCongo and 900 m in Uganda.

Food and Feeding. Arthropods, including orthopterans, mantids, beetles (Coleoptera) and caterpillars. Usually solitary, in territorial pairs. Extremely shy and skulking; forages usually 2–8 m above ground level, favouring dense understorey and disturbed areas such as treefall gaps, margins of clearings and ecotone between unlogged and regenerating forest. Likes damp spots and riverine vegetation.

Breeding. Nesting recorded in Oct in Cameroon and Dec–Mar (but extended season suspected) in Gabon; birds in breeding condition in Feb and Jul and juveniles in Mar and Jul in Angola. Territorial; same area occupied for many consecutive years. One nest described, a tangled mass of thin, dry creeper tendrils with shallow cup in centre, built upon base of dead twigs in form of a rectangle, external diameter 15 cm, internal 7 cm, placed 0·75 m above ground on small branches and skeletonized leaves of bush in thick undergrowth at forest edge, 12 m from cleared area. Clutch 2 eggs; incubation by female only, male sings nearby; no information on incubation and nestling periods; young out of nest fed by both parents.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Not uncommon to common. Estimated densities in Gabon 1 pair/20 ha in primary forest and 2–3 pairs/10 ha at forest edge. Occurs in a number of national parks, including those of Campo Ma'an, in Cameroon, Gamba, in Gabon, Dzanga-Ndoki, in Central African Republic, Odzala, in PRCongo, Salonga, in DRCongo, Quiçama, in Angola, and Semliki, in Uganda.

Bibliography. Bannerman (1939), Borrow & Demey (2001), Britton (1972, 1980), Brosset (1971a), Brosset & Érard (1976, 1986), Chapin (1953), Christy & Clarke (1994), Dean (2000), Dean *et al.* (2002), Dowsett & Dowsett-Lemaire (1993, 1997), Dowsett & Forbes-Watson (1993), Dowsett-Lemaire & Dowsett (1991), Fishpool & Evans (2001), Fry *et al.* (2000), Green & Rodewald (1996), Hall & Moreau (1970), Lippens & Wille (1976), Louette (1981), Mackworth-Praed & Grant (1960, 1963, 1973), Prigogine (1971, 1978, 1984), Sargeant (1993), Schouteden (1957), Stevenson & Fanshawe (2002).

Genus *BERNIERIA* Bonaparte, 1854

134. **Common Tetraka**

Bernieria madagascariensis

French: Bulbul tétraka **German**: Gmelinbülbül **Spanish**: Bulbul Tetraka
Other common names: Long-billed/Madagascar Greenbul

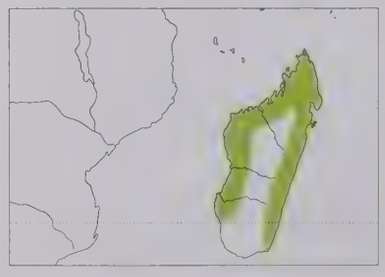
Taxonomy. *Muscicapa madagascariensis* J. F. Gmelin, 1789, Madagascar.

Relationships with rest of family uncertain. Previously thought close to species currently placed in *Xanthomixis* but formerly included in present genus; recent data derived from mitochondrial DNA sequencing indicate, however, that the two groups are not monophyletic. Two subspecies recognized.

Subspecies and Distribution.

B. m. inceleber Bangs & Peters, 1926 – N & W Madagascar (Montagne d'Ambre and Sambirano S to Toliara), including Nosy Be.

B. m. madagascariensis (J. F. Gmelin, 1789) – E Madagascar (Andapa S to Tolagnaro), including Sainte Marie I.



Descriptive notes. 17·5–20 cm; male 22–39 g, female 20·5–31·5 g. A medium-sized, slender species, notable for distinctive long and thin bill, upper mandible with terminal hook, lower mandible slightly inflated centrally, and marked sexual dimorphism in size. Has top of head and upperparts, including tail, dull dark brownish-green, wings slightly darker, flight-feathers brown with indistinct narrow yellowish edges; lores, cheeks and ear-coverts dull brownish-green, ill-defined darker eyestripe, indistinct, narrow paler olive-yellow supercilium, most obvious in front of eye, ear-coverts brownish-green thinly streaked with olive-yellow; inconspicuous narrow eyering yellowish-green above and below eye, darker brownish-green before and behind eye (thus blending with supercilium and eyestripe);

chin and throat yellow, centre of breast and upper belly duller yellow to off-white, rest of breast, flanks, lower belly and undertail-coverts olive-green; iris chestnut or mid-brown; upper mandible dark grey-brown, lower mandible dark brown distally, pinkish-horn basally and on underside, cutting edges of both mandibles pale; legs brown or greyish-brown. Differs from *Xanthomixis zosterops* in longer bill, lack of contrasting eyering, duller coloration above and below. Sexes similar, except that female on average much smaller and with proportionately shorter bill. Juvenile is duller and browner above, supercilium and eyestripe less developed, underparts less yellow, bill shorter and paler. Race *inceleber* has upperparts paler and greyer than nominate. VOICE. Song, at all hours of day, usually from concealed perch at c. 10 m, an irregular series of melodious notes, "chee tee tee tee", loud initially but becoming quieter, often preceded by few well-separated "tchip" notes, song repeated after a few seconds. Contact call a short, repeated characteristic "chep" or "cherr" and short rattle; alarm also a rattled "chack"; calls deeper and harsher than those of *Xanthomixis*.

Habitat. Primary evergreen forest in E, and dry deciduous forest in W; infrequently, adjacent secondary areas. From sea-level to 1300 m in E, to 1000 m in W.

Food and Feeding. Arthropods, including beetles (Coleoptera), cockroaches (Blattodea), ants (Hymenoptera), bugs (Hemiptera), orthopterans, lepidopterans, spiders (Araneae), millipedes (Diplopoda); also small vertebrates (geckos). Gregarious; occurs in groups of 3–10 individuals, often with *Xanthomixis zosterops*, and a regular component of mixed-species flocks. Noisy and bold. Prefers lower and middle strata, 1–20 m, but less frequently in undergrowth than *X. zosterops*. Forages in dense vegetation, carefully inspecting bunches of dead leaves, fallen trees, bases of palm fronds, epiphytes. Often climbs up and down trunks and branches, including vertical ones, looking for prey. Feeds by gleaning and probing.

Breeding. Birds in breeding condition in Nov, dependent young in Dec and immatures in Sept, Nov–Jan and Mar; thought to breed Sept–Feb; song is most evident Dec–Feb. No other information.

Movements. No information; presumed sedentary.

Status and Conservation. Not globally threatened. Generally common, although rather less so in SW of range. Mean recorded densities of 1·7–2·3 birds/ha in Montagne d'Ambre, 157–214/km² in Andohahela, 68 birds/km² in Anjanaharibe-Sud, 53 birds/km² in Zahamena. Found at most forest sites and occurs in numerous protected areas, including Montagne d'Ambre, Masaola, Ankarafantsika, Mantadia-Analamazaoatra, Ranomafana, Kirindy, Zombitse-Vohibasia and Andohahela.

Bibliography. Benson & Irwin (1975), Benson *et al.* (1976), Cibois *et al.* (2001), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fjeldså *et al.* (1999), Goodman (1993), Goodman & Benstead (2003), Goodman & Parillo (1997), Goodman & Puttnam (1997), Goodman, Andrianarimisa *et al.* (1996), Goodman, Hawkins & Razafimahaimodison (2000), Goodman, Pidgeon *et al.* (1997), Hawkins (1995, 1999), Hawkins & Goodman (1999), Hawkins *et al.* (1998), Hino (1998), Langrand (1990, 1995), Milon *et al.* (1973), Morris & Hawkins (1998), Mustoe, Capper, Lowen, Leadley & Rakotomalala (1998), Mustoe, Capper, Lowen, Leadley, Rakotomalala & Randrianarivo (2000), Rand (1936), Safford & Duckworth (1990), Sinclair & Langrand (1998), Thompson & Evans (1991), Thompson *et al.* (1987).

Genus *XANTHOMIXIS* Sharpe, 1881

135. **Short-billed Tetraka**

Xanthomixis zosterops

French: Bulbul à bec court **German**: Kurzschnabelbülbül **Spanish**: Bulbul Piquicorto
Other common names: Short-billed/Spectacled Greenbul

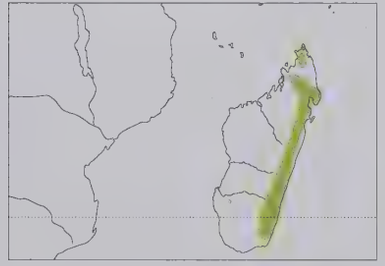
Taxonomy. *Bernieria zosterops* Sharpe, 1875, Madagascar.

Relationships of genus with rest of family uncertain. Genus previously merged with *Bernieria*, but recent mitochondrial DNA sequence data indicate that the five species then involved are not a monophyletic group. Hence, this species and its relatives better placed in present genus. Thought probable, on basis of similarities in plumage pattern, that present species is most closely related to little-known *X. tenebrosus*. Proposed races *andapae* (Andapa) and *ankafanae* (Ankafana Forest, in Fianarantsoa) are poorly differentiated, and thus treated as synonyms of nominate. Two subspecies recognized.

Subspecies and Distribution.

X. z. fulvescens (Delacour, 1931) – Montagne d'Ambre, in N Madagascar.

X. z. zosterops (Sharpe, 1875) – E & SW Madagascar (Manongarivo and Tsaratanana Massif S to Tolagnaro, also isolated population at Analavelona).



Descriptive notes. 16–16·5 cm; male 16–20·5 g, female 13·5–22·5 g. A small species with distinctive face pattern, lower mandible slightly inflated centrally and thus appearing somewhat upcurved distally, long rictal bristles. Nominate race is bright olive-green above, tail and wings darker brownish-olive, leading edges of flight-feathers yellow; yellow strip on lores from base of bill to upper half of eye, where contiguous with upper part of wide, well-defined, conspicuous broken yellow eyering; preocular area below loral line (from base of lower mandible to front edge of eye) and onto cheek dark olive, ear-coverts slightly paler olive-green; chin, throat and malar area bright yellow, contrasting with dark preocular patch; breast and flanks olive-green, belly and undertail-coverts yellow; iris mid-brown, dark brown or chestnut; upper mandible brown with yellow cutting edge or completely black, lower mandible light brown, pale yellow-brown, yellow, orange-yellow or pinkish-brown; legs greyish-pink to greyish-yellow, orange-pink or pale flesh, claws pinkish-grey or yellow. Differs from *Bernieria madagascariensis* in smaller size, much shorter bill, yellow "spectacles". Sexes alike, female on average smaller than male. Juvenile has less distinct spectacles, duller throat. Race *fulvescens* is paler and greyer above, and whiter and less yellow below than nominate. VOICE. Quite loud, high-pitched seeping and twittering noises, resembling those of congeners but unlike those of *B. madagascariensis*. Call a high-pitched, rather hoarse, unintrusive "tsit", repeated irregularly, also spluttered "ptrrr"; song an irregular descending series of similar notes.

Habitat. Primary evergreen forest from sea-level to 1500 m, but much less common at higher altitudes; published record from 1800 m requires confirmation. Enters second growth where close to undisturbed forest.

Food and Feeding. Arthropods, including beetles (Coleoptera), termites (Isoptera), earwigs (Dermaptera), bugs (Hemiptera), ants (Hymenoptera), orthopterans and spiders (Araneae). Gregarious; usually occurs in groups of up to 20 individuals, frequently in monospecific flocks, but often in company with *Bernieria madagascariensis*, White-throated Oxylabes (*Oxylabes madagascariensis*) and other species in mixed flocks. At dusk often encountered in single pairs, suggesting that foraging flocks disperse prior to roosting. Forages 0·5–5 m above ground level, hence on average lower than *B. madagascariensis*. Not shy. Frequently perches on vertical stems of thin saplings and trees, up which it works rapidly, making short flights to catch arthropods so disturbed. Gleans in particular in vegetation of small understorey shrubs, as well as creepers, ferns, etc.; also sally-gleans insects from, especially, the undersides of leaves.

Breeding. Nesting recorded in Sept–Dec. Possibly a co-operative breeder; groups of three adults feeding juveniles. Nest cup-shaped, made of moss, plant stems, dead leaves and other vegetation, typically 0·5–1 m above ground and suspended in a horizontal fork of understorey shrub. Clutch 3–4 eggs; no information on incubation and fledging periods.

Movements. No information; presumed sedentary.

Status and Conservation. Not globally threatened. Generally common throughout its range. Mean densities of 17·5 birds/ha recorded in Montagne d'Ambre and of 552–706 birds/km² in Zahamena. Occurs in numerous protected areas, including Montagne d'Ambre, Marojejy, Masaola, Zahamena, Mantadia-Analamazaoatra, Ranomafana, Andringitra and Andohahela.

Bibliography. Anon. (1999b), Benson & Irwin (1975), Benson *et al.* (1976), Cibois *et al.* (2001), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fjeldså *et al.* (1999), Goodman & Benstead (2003), Goodman & Parillo (1997), Goodman & Puttnam (1997), Goodman, Andrianarimisa *et al.* (1996), Goodman, Hawkins & Razafimahaimodison (2000), Goodman, Pidgeon *et al.* (1997), Hawkins (1995, 1999), Hawkins & Goodman (1999), Hawkins *et al.* (1998), Langrand (1990, 1995), Milon *et al.* (1973), Morris & Hawkins (1998), Rand (1936), Safford & Duckworth (1990), Sinclair & Langrand (1998), Thompson & Evans (1991), Thompson *et al.* (1987).

136. **Dusky Tetraka**

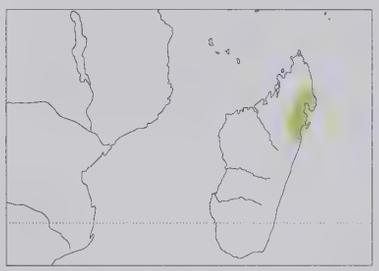
Xanthomixis tenebrosus

French: Bulbul obscur **German**: Sianakabülbül **Spanish**: Bulbul Oscuro
Other common names: Dusky Greenbul

Taxonomy. *Bernieria tenebrosa* Stresemann, 1925, Sianaka Forest, central eastern Madagascar.

Relationships of genus with rest of family uncertain. Genus previously merged with *Bernieria*, but recent mitochondrial DNA sequence data indicate that the five species then involved are not a monophyletic group. Hence, this species and its relatives better placed in present genus. Thought probable, on basis of similarities in plumage pattern, that present species is most closely related to *X. zosterops*. Monotypic.

Distribution. NE Madagascar, from at least Marojejy S to Zahamena.



Descriptive notes. 14–15 cm; one unsexed 21·4 g. Small species, dark with yellow throat, robust legs, fairly short bill with lower mandible slightly inflated centrally and appearing somewhat upcurved distally. Plumage is dark dull olive-green above, tail and wings dark dull olive-brown, outer edges of flight-feathers dark green; supraloral area yellow, remainder of face side dark olive-green, conspicuous and contrasting yellow broken eyering; chin, throat and malar area yellow, breast, flanks and undertail-coverts dark olive-green, belly and vent yellow-green; iris mid-brown; bill dull pinkish-orange, dark culmen; legs pale fleshy pink. Differs from similar *X. zosterops* in darker underparts contrasting more strongly with yellow throat, shorter tail, longer, stouter legs and feet. Sexes alike, female on average smaller than male. Juvenile undescribed. VOICE. A series of quiet, high-pitched hissing and twittering calls, similar to those of other members of genus; single contact call a quiet "tseip" or "tsit".

Habitat. Primary lowland and evergreen forest, up to 950 m.

Food and Feeding. Arthropods. Occurs in small groups; sometimes in mixed-species flocks. Largely terrestrial, foraging in areas of often sparse understorey and deep leaf litter; hops rapidly. Sometimes seen in low shrubs, to 0·5 m, particularly when calling. Report of a single individual at 2 m moving through tall branches and clinging to vertical stems seems exceptional, and possibly based upon a misidentification.

Breeding. No information.

Movements. No information; presumed sedentary.

Status and Conservation. VULNERABLE. Restricted-range species: present in East Malagasy Wet Forests EBA. Global population estimated to number fewer than 10,000 individuals. Clearly rare and local, as numerous recent intensive surveys in many forests of E Madagascar, covering wide range of habitats and altitudes, have failed to locate it. Enigmatic; has been widely misidentified in the past, since key identification criteria only recently determined and still poorly understood. Only recent documented records are from Marojejy and Zahamena National Parks; reported also from Masaola, Perinet Special Reserve and Maroantsetra, but without details. Earlier specimen records from elsewhere, including the Andasibe–Mantadia region, but precise localities and altitudes are not known. Outside protected areas, main threats are from forest clearance for subsistence agriculture, which is most prevalent at altitudes at which present species is known to occur.

Bibliography. Anon. (1999b), Benson & Irwin (1975), Benson *et al.* (1976), Butchart & Stattersfield (2004), Cibois *et al.* (2001), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fjeldså *et al.* (1999), Goodman & Benstead (2003), Goodman *et al.* (2000), Hawkins (1995, 1999), Jenkins (1987), Langrand (1990, 1995), Morris & Hawkins (1998), Rand (1936), Randriamanindry (1995), Sinclair & Langrand (1998), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

137. **Appert's Tetraka**

Xanthomixis apperti

French: Bulbul d'Appert **German**: Appertbülbül **Spanish**: Bulbul de Appert
Other common names: Appert's Greenbul

Taxonomy. *Phyllastrephus apperti* Colston, 1972, 40 km south-east of Ankazoabo, south-western Madagascar.
Relationships of genus with rest of family uncertain. Genus previously merged with *Bernieria*, but recent mitochondrial DNA sequence data indicate that the five species then involved are not a monophyletic group. Hence, this species and its relatives better placed in present genus. Recent molecular data indicate that present species is sister of *X. cinereiceps*. Monotypic.
Distribution. Zombitse and Vohibasia forests (near Sakaraha) and Analavelona forest, in SW Madagascar.



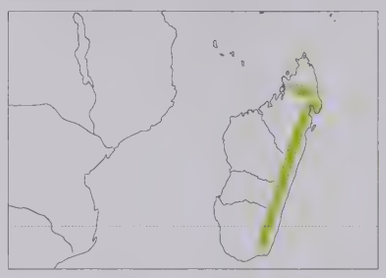
Descriptive notes. c. 15 cm; 11–17 g. A smallish, slender, distinctively patterned species, narrow bill with lower mandible slightly inflated centrally. Top of head and neck are blue-grey, upperparts, including tail, greenish olive-grey, wings slightly darker, narrow pale yellow fringes on edges of flight-feathers; buffish-white to pale grey supercilium well defined in front of eye, indistinct behind; grey eyestripe dark on lores, paler and less distinct behind eye, blue-grey ear-coverts; eyering pale whitish-grey above and below eye, dark grey in front of and behind eye, blending with supercilium, eyestripe and pale grey cheeks; chin, throat and malar area white, underparts warm yellow, brightest on flanks, centre of belly whitish; iris dark brown; bill dirty pale pink basally, most of upper mandible dark, distal third of lower mandible sometimes also dark; legs pale horn or pale reddish. Sexes alike, female on average smaller than male. Juvenile undescribed. Voice. Call a high, shivering "tsee" or "tseetsee", similar to that of *X. cinereiceps*; also high-pitched alarm, "tsirr".
Habitat. Deciduous forest at 600–800 m, and a tract of relict evergreen forest on isolated massif at 900–1330 m.
Food and Feeding. Arthropods. Occurs in small groups of 2–8 individuals, occasionally singly; sometimes in mixed-species flocks with *Bernieria madagascariensis*. Forages in low dense understorey, rarely above 1 m; often walks on the ground, with wings drooped, gleaning insects from leaves, branches and leaf litter. Perches in low bush when disturbed. Reported also as rising up to 5 m, and as clinging to liane tangles.
Breeding. No information. Subadult recorded in Apr.
Movements. No information; presumed sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in West Malagasy Dry Forests EBA. Very rare and highly localized; population within tiny range estimated to number fewer than 2500 individuals. Known only from a tiny part of Zombitse-Vohibasia National Park and, c. 50 km W of there, the unprotected Analavelona forest. Zombitse and Vohibasia forests were threatened mainly by clearance for maize cultivation and charcoal production; following conservation efforts, including the creation of the national park, there has been no further clearance for several years. Analavelona forest is not managed for conservation, but is relatively isolated and clearance is not thought an imminent threat.
Bibliography. Anon. (1999b), Benson & Irwin (1975), Butchart & Stattersfield (2004), Cibois *et al.* (2001), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Colston (1972b), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Fishpool & Evans (2001), Fjeldså *et al.* (1999), Goodman & Benstead (2003), Goodman & Langrand (1994), Jenkins (1987), Langrand (1990, 1995), Langrand & Goodman (1997), Milon *et al.* (1973), Morris & Hawkins (1998), Mustoe, Capper, Lowen, Leadley & Rakotomalala (1998), Mustoe, Capper, Lowen, Leadley, Rakotomalala & Randrianarivo (2000), Sinclair & Langrand (1998), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

138. Grey-crowned Tetraka

Xanthomixis cinereiceps

French: Bulbul à tête grise **German**: Grauscheitelbülbül **Spanish**: Bulbul Coronigrís
Other common names: Grey-crowned Greenbul

Taxonomy. *Oxylabes cinereiceps* Sharpe, 1881, Fianarantsoa, Madagascar.
Relationships of genus with rest of family uncertain. Genus previously merged with *Bernieria*, but recent mitochondrial DNA sequence data indicate that the five species then involved are not a monophyletic group. Hence, this species and its relatives better placed in present genus. Recent molecular data indicate that present species is sister of *X. apperti*. Monotypic.
Distribution. NW & E Madagascar (Manongarivo and Tsaratanana, and from Marojejy S to Andohohela).



Descriptive notes. c. 14 cm; 13·5–24·5 g. A small, neat, plain-faced species with few distinguishing features, lower mandible slightly inflated centrally and appearing somewhat upcurved distally. Top of head is blue-grey, mantle and back olive-green, wings and tail slightly darker olive-green, leading edges of flight-feathers with dull pale yellow fringes; lores usually pale greyish-brown, cheeks and ear-coverts blue-grey with some indistinct narrow paler shaft streaking; throat dirty white, breast and belly yellow, darker olive-yellow on sides of breast, flanks and undertail-coverts; iris dark brown or mid-brown; upper mandible dark horn or black with grey cutting edge, lower mandible pale pink or pinkish-grey with dark horn or black tip; legs mid-grey or pale greyish-flesh. Sexes alike, female on average smaller than male. Juvenile is uniform grey-green above, dull buffy below with slightly paler throat; later becomes more grey-tinged on crown, with slightly yellow-tinged underparts and whitish-yellow throat, gape orange. Voice. Song, from shrub-layer perch, a series of spluttering and seeping notes; call a series of single or multiple high-pitched "tsip" notes and spluttering trills.
Habitat. Montane evergreen forest between 800 m and 2000 m, mostly above 1000 m and, usually common only over 1400 m. Not found in disturbed forest.
Food and Feeding. Thought to be mainly insectivorous. Occurs singly or in pairs, often in association with other species, including with *X. zosterops* (where altitudinal ranges overlap) and Wedge-tailed Jery (*Hartertula flavoviridis*). Forages mainly at 0·5–15 m, particularly on vertical moss-clad tree trunks and branches (diameter 2 cm to 1 m), which it climbs nimbly, rather in manner of a nuthatch (*Sitta*). Moves between trunks with strong undulating flight, landing near base and working upwards. Also searches in small shrubs among twigs, occasionally leaves, and on the ground and moss-covered stones. Specialization of foraging on moss-covered trunks is strong, and may explain why this species is rare or absent below 800–1000 m (only limited moss growth at lower altitudes).
Breeding. Nesting recorded in Nov and juveniles in Nov–Dec. May be a co-operative breeder; record of three adults feeding two chicks at single nest. Nest bowl-shaped, depth 5–7 cm, made exclusively of moss, lined with dry grass and palm fibres, built 1–2 m above ground in horizontal fork of small branch. Clutch 3 eggs; no information on incubation and fledging periods.
Movements. No information; presumed sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in East Malagasy Wet Forests EBA. Fairly common in parts of its range. Thought to have a fairly small population as a result of its restricted altitudinal range, and potentially to be threatened by forest loss from subsistence agriculture. Occurs in a number of national parks and other protected areas, including Marojejy, Mantadia, Ranomafana and Andohohela.
Bibliography. Anon. (1999b), Benson & Irwin (1975), Butchart & Stattersfield (2004), Cibois *et al.* (2001), Collar & Andrew (1988), Collar & Stuart (1985), Collar *et al.* (1994), Dee (1986), Dowsett & Dowsett-Lemaire (1993), Dowsett & Forbes-Watson (1993), Evans *et al.* (1992), Fishpool & Evans (2001), Fjeldså *et al.* (1999), Goodman & Benstead (2003), Goodman & Puttnam (1997), Goodman, Hawkins & Razafimahaimodison (2000), Goodman, Pidgeon *et al.* (1997), Hawkins (1995, 1999), Hawkins & Goodman (1999), Hawkins *et al.* (1998), Jenkins (1987), Langrand (1990, 1995), Milon (1951b), Milon *et al.* (1973), Morris & Hawkins (1998), Safford & Duckworth (1990), Sinclair & Langrand (1998), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Thompson & Evans (1991, 1992), Thorstrom & Watson (1997).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family CHLOROPSEIDAE (LEAFBIRDS)



- Medium-sized, arboreal passerines with proportionately short tarsus and toes, small rictal bristles, straight to lightly decurved bill, and channelled, brush-tipped tongue; plumage green, variously with areas of shining blue, black, yellow and orange.
- 14–21 cm.



- Oriental Region.
- Lowland rainforest to monsoon and montane forests, some extending to secondary growth and orchards.
- One genus, 11 species, 27 taxa.
- One species threatened; none extinct since 1600.

Systematics

The only chloropseids known are the leafbirds that are alive today. This group was introduced to science by an eighteenth-century painting that, in 1789, supplied the basis of J. F. Gmelin's description of "*Turdus cochinchinensis*", recognized as being the Blue-winged Leafbird (*Chloropsis cochinchinensis*).

Baron G. Cuvier seems to have been aware of the brush-tipped structure of the leafbird tongue, and in his *Règne Animal*, published in 1817, he used this character to align *cochinchinensis* with the friarbirds (*Philemon*), a genus of meliphagid honeyeaters. The later authors of the entity *Chloropsis* knew about it, too, and guessed accurately at its function. Apart from indicating similarities to the sunbirds (Nectariniidae), however, they refrained from taking a position, as a rival link had by then been proposed with "*Brachypus*", the so-called short-legged thrushes or, in modern parlance, the bulbuls (Pycnonotidae). Most mid-century systematists opted for Cuvier's alternative, but in India, over the same period, E. Blyth and, after him, T. C. Jerdon championed the bulbul hypothesis, a view that anyone handling a live leafbird might even now support, given the bird's general "jizz", body proportions, and such clues as the ease with which feathers of the back and rump are shed, as though deliberately autotomized. Blyth is also the first author to have linked the leafbirds with two other small Oriental groups, the ioras (*Aegithina*) and the fairy-bluebirds (*Irena*), in a special subfamily of the Pycnonotidae. Shortly thereafter, perceptions of the family Pycnonotidae changed. By the 1860s, it was considered to be timalioid and to contain not only bulbuls, but also many genera of what are now called babblers (Timaliidae). Indeed, rather than linking *Chloropsis* with any strictly bulbul genus, G. R. Gray, in 1869, placed it next to *Myzornis*, a monotypic babbler, chosen, no doubt, for its tongue morphology and its green colours.

A decade later, in the influential *Catalogue of the Birds in the British Museum*, R. B. Sharpe pushed this position still further, treating leafbirds, ioras, fairy-bluebirds and bulbuls as actual timaliids, united in a special subfamily, the Brachypodinae. Over most of a century thereafter, the leafbirds and the ioras remained linked, at times together with the fairy-bluebirds and at others without them, as genera once again of a family Pycnonotidae or, on evidence of jaw musculature, as a tribe of a subfamily Pycnonotinae of a greatly expanded Sylviidae. Alternatively, they were hived off to a small family of their own, as was proposed in 1927, "for convenience", by H. C. Robinson. In his 1960 text for J. L. Peters's *Check-list of Birds of the World*, J. Delacour opted for an inclusive Irenidae, next to bulbuls, although he may not by then have considered osteological characters, including those of the palate, that, in the view of A. Wetmore, permitted a continued connection between leafbirds and ioras but distanced these two from the bulbuls, and still further from the fairy-bluebirds. Despite what was by that time a growing opinion among field observers that living leafbirds and ioras exhibited no obvious features in common, one or other of these arrangements held sway until the era of molecular taxonomy.



While the systematic position of leafbirds in relation to other families has taken well over a century to decode, and still awaits conclusive resolution, the relationships within the family are hardly less complex. For example, the ***Blue-winged Leafbird*** *was until recently considered conspecific with Jerdon's Leafbird* (Chloropsis jerdoni) *and the Bornean Leafbird* (C. kinabaluensis)*, but the three are now deemed worthy of separate species status on morphological grounds. Meanwhile, the morphological differences separating Sumatran birds (sometimes placed in* icterocephala*) from continental birds seem insignificant, and the two are commonly merged within* moluccensis.

[*Chloropsis cochinchinensis moluccensis*, Way Kambas National Park, Sumatra. Photo: Tony Tilford]



*This male **Greater Green Leafbird** demonstrates several features typical of the family. First, and perhaps most obviously, it is bright green, a relatively unusual colour for passerines, but excellent camouflage in leafy canopies. Next, it has short robust legs, appropriate tools for an arboreal lifestyle. Finally, it has a black mask, highlighted by a paler surround, and a violet-blue jawline streak, just discernable in this photograph, but much more conspicuous when the blue feathers are erected. This species, the largest of all leafbirds, has the strongest, most distinctly hook-tipped bill in the family.*

[*Chloropsis sonnerati*. Photo: Konrad Wothe]

From DNA–DNA hybridization findings, C. G. Sibley and J. E. Ahlquist, in their 1990 publication on the phylogeny of birds, upheld the birdwatchers' view and severed the iora connection, leaving the leafbirds linked once more with the fairy-bluebirds, near the base of their "parvorder" Corvida. More recent base-sequence analysis of nuclear-gene DNA by F. K. Barker and colleagues supports this separation from ioras; indeed, it widens it decisively by transferring the leafbirds and the fairy-bluebirds entirely out of Corvida and into Sibley and Ahlquist's other "parvorder" of the oscine passerines, Passerida. Both approaches treat these two groups as constituting one family, although it seems that a case in support of linkage at that level has still to be made. The decision not to accept it in the present work is provisional. Either way, no close connection between the leafbirds and the bulbuls, babblers, honeyeaters or ioras survives. Instead, the chloropseids emerge as the sister-group of an enlarged family Passeridae, nested within the fairy-bluebirds and, ultimately, the sunbirds.

Delacour's review of the leafbirds accepted eight species, many fewer than were recognized by Sharpe in his *Catalogue*. Currently, eleven are recognized, more than on Delacour's list but by no means signalling a return to nineteenth-century practice. The technical explanation of this revision was published by D. R. Wells and co-workers in 2003. Essentially, it repairs a gap in Peters's *Check-list*, and applies assumptions concerning species limits that question certain mid-twentieth-century acts of lumping. The overlooked taxon is *Chloropsis kinabaluensis*, the Bornean Leafbird. This species, formerly known as *flavocincta*, is endemic in upland forests of Borneo and was for many decades treated as a subspecies of the widespread lowland Blue-winged Leafbird. As with most leafbird species, males of the latter have a black facial mask and throat, whereas females do not, implying that this difference acts in sexual recognition (see Morphological Aspects). The only non-black-faced stages of *kinabaluensis*, on the other hand, are juvenile, disrupting a signal that might facilitate matings between these taxa. Further differences between Bornean and Blue-winged Leafbirds include other obvious plumage characters, measurements, size dimorphism and bill morphology. There is no record of intergradation between the two, even though their ranges in continuous habitat meet parapatrically or are separated by only a short span of altitude.

If the criterion of an equivalent amount of morphological divergence is applied elsewhere in Delacour's *Chloropsis cochinchinensis* complex, the fully allopatric Indian taxon *jerdoni* must also be split off as a separate species, Jerdon's Leafbird (*Chloropsis jerdoni*). This leaves a still polytypic but shrunken, morphologically much better-integrated species occupying just the South-east Asian lowland heartland of the family, extending west to Assam. As full species, potentially, these two and the Bornean *kinabaluensis* still form a superspecies. The allopatric Yellow-throated Leafbird (*Chloropsis palawanensis*), blue-winged but with no black at all on the head, is a reasonably safe fourth member of that superspecies, and the even more extensively hen-plumaged Philippine Leafbird (*Chloropsis flavipennis*) of elsewhere in the Philippines a far less certain fifth. The latter's only suggestive link (but see Voice) is the similarity of the yellow wing pattern to that of the geographically distant Jerdon's Leafbird.

Elsewhere in the family, these same arguments have been applied to the Sumatran taxon *media*, considered since Delacour's review as a remote subspecies of the Golden-fronted Leafbird (*Chloropsis aurifrons*), a species that otherwise no longer enters the Sunda region. Males of *media* exhibit a typical black mask and throat but females do not, whereas, throughout the continental range of *C. aurifrons*, both sexes have these areas of the plumage black, with only juveniles being entirely green-headed. This situation mirrors that of the Blue-winged and Bornean Leafbirds, and forces the same conclusion, albeit without the parapatry element. From their undoubted connection via other characters, it follows that the Sumatran Leafbird (*Chloropsis media*) and the restricted Golden-fronted Leafbird should also be treated as forming a superspecies.

Morphological Aspects

Chloropseids range in size from the Blue-masked Leafbird (*Chloropsis venusta*), with a wing length of 68–72 mm, males unlikely to weigh more than 15 g and females probably less, to the Greater Green Leafbird (*Chloropsis sonnerati*), with male wing length up to 105 mm and weight up to 48 g. Almost as long-winged but not quite so heavy are outer-tropical representatives of the Golden-fronted and Orange-bellied Leafbirds (*Chloropsis hardwickii*).

Only in the inner South-east Asian tropics do three or more taxa co-occur all year round. These are typically well spaced over the family spectrum of size or, where overlap occurs, as between the Lesser Green (*Chloropsis cyanopogon*) and Blue-winged Leafbirds in lowland forests of the Sunda region, they focus on



*Sexual dimorphism in plumage reaches its peak amongst leafbirds in the **Orange-bellied Leafbird**. The gaudy male, perhaps the most spectacular member of the family, is pictured here alongside his relatively sombre mate. Males combine a melodious song with a pleasing assortment of colours, including black and violet-blue on the face, bronzy-yellow on the nape, brilliant electric blue on the wings, tawny orange on the belly, and grass-green on the mantle, making them very popular in avicultural circles. In at least some races, conversely, the female is a dowdy creature, little sought-after as a cage-bird, and often passed over in the field.*

[*Chloropsis hardwickii*. Photo: Cyril Laubscher]

different parts of the habitat. On the forested submontane slope of the Sumatran Barisan Range, uniquely, as many as five species could meet. These span the extremes of size, but the Greater Green Leafbird and the almost equally large Sumatran Leafbird are presumed to differ in some aspect of ecology still to be researched.

Beyond that, all chloropseids are, at a glance, obvious leafbirds. Overall shape and proportions seem standard, and the "leaf" part of the vernacular name denotes predominant to near-complete greenness of the plumage. Among species, and some subspecies particularly of the Blue-winged Leafbird, colour tone ranges from bright shades of grass-green or emerald-green to, especially on the underparts, yellowish-tinted or viridian-tinted green. All supply highly effective camouflage to the birds while they forage or are brooding on nests amid canopy foliage, although seasonally much less, of course, to the few populations of Jerdon's and Golden-fronted Leafbirds that inhabit deciduous forest.

Relieving colours and patterns are limited, but spectacular. In all except the Philippine Leafbird and the female Bornean Leafbird, adults of both sexes develop a semi-erectile jawline flash of glistening turquoise to violet-blue or rich cobalt-blue, varying according to species. This flash of colour is usually larger on males, and in some, but not all, subspecies of the Golden-fronted Leafbird it covers the whole of the chin and upper throat. Acquired at post-juvenile moult, this feature has no precursor and must signal sexual maturity.

Again excluding the Philippine Leafbird, and in this instance also the Blue-masked Leafbird, the green colours of adult males are relieved by a patch of iridescent viridian or turquoise to clear blue over the inner leading lesser upperwing-coverts. Hidden when the bird is relaxed, this patch is exposed during aggressive encounters, in certain courtship postures, and at take-off. In several species, an only slightly smaller or less brilliant patch is also present on adult females. Both sexes of all subspecies of the Blue-winged Leafbird, and both sexes of the Bornean Leafbird, have such a patch, in these cases greatly expanded out over the carpus, alula and primary coverts and the outer webs of most flight-feathers; it is boldly visible in the closed wing. The tone of the exposed part varies geographically, from bright aquamarine to a mixture of clear and deep, rich cobalt, the latter occurring in the Sunda region. Interestingly, the Bornean Leafbird differs sharply from the Bornean race of the Blue-winged Leafbird in this respect. The related, island-living Yellow-throated Leafbird retains almost as much blue, although of a rather duller tone, and both sexes of these three species also have an extensively blue tail. The only near-parallel development of blue in the wing occurs in the adult male Orange-bellied Leafbird, and the female of this species shows a little blue in the tail, which is deep black with dark purplish-blue edges in males. Uniquely, both sexes of the little Blue-masked Leafbird have a light blue anterior cap and ear-coverts, the adult female also has the chin and throat blue, and both show blue on the tail; males have an additional bright blue flash on the leading edge just of the carpus.

A better-known plumage variable is the mask, typically enclosing the side of the face up to the level of the lores and the middle of the eyes, and the chin to the throat or upper breast, hence also enclosing the blue jawline flash. The mask is velvety black in all chloropseids except the Blue-masked Leafbird, in which the only dark part is deep brown and it is limited to the chin and throat. All adult males other than those of the two Philippine endemics exhibit it, as also do adult females of the surely unrelated Golden-fronted and Bornean Leafbirds. Whatever its main signal function, the mask presumably aids the recognition at least of maturity; in the case of the rainforest-dwelling Greater Green and Blue-winged Leafbirds, moreover, random variation in shape and size of the bib part implies that it may even assist the identification of individuals. In all taxa, the mask form is accentuated by the brilliance of juxtaposed colour: turquoise or brilliant green or, in the Golden-fronted, Sumatran, Blue-masked and Blue-winged Leafbirds, and narrowly in a subspecies of the Lesser Green Leafbird, a partial or full surround of contrast-heightening yellow to golden-yellow or orange. This reaches an extreme in some Sunda region subspecies of the Blue-winged Leafbird, in which most of the rest of the head is bright yellow. Reduced amounts of similar colours recur in the females of some of these species, and the otherwise mostly green females of several others show a yellow forehead, throat and/or eyering, such patterns being found as well in both sexes of the two maskless Philippine species.

Juveniles show the least colour relief, with never a trace of a mask or jaw flash and, otherwise, not more than a subdued expression of adult female plumage. Some are featurelessly green, to an extreme extent in the Orange-bellied Leafbird, which, as an adult, is arguably the gaudiest of all members of the family.



*Most members of the family, including the **Golden-fronted Leafbird**, deliver powerful songs, often from perches in the uppermost canopy. These outpourings tend to be varied and sustained, containing liquid warbles, resonant notes, repetitions, and a great deal of mimicry. In general, they are easily assigned to the family, but not to its constituent species, in part because so little use is made of species-specific elements. It is tempting to conclude that, like most mimetic oscines, repertoire size is an important sexual signal. If this is shown to be the case, the system incorporates an extra layer of complexity as, in at least some species of leafbird, both sexes sing.*

[*Chloropsis aurifrons*. Photo: Roland Seitre]



Leafbirds are often cited as ardent nectarivores. As it happens, this habit varies regionally and cannot be applied to all members of the family; it is standard practice in the Indian Subcontinent, for example, but noted much less often in South-east Asia, where leafbird diversity reaches its peak. Attendance at flowering trees is most common in three species with bills that are relatively slender, pointed and decurved, and with brush-like tongues that are relatively long; one of these is the ***Golden-fronted Leafbird****. While these birds are well designed for the task of nectar gleaning, most leafbirds probably harvest nectar only occasionally.*

[*Chloropsis aurifrons aurifrons*, Kaziranga National Park, India. Photo: Gertrud & Helmut Denzau]

Only a few really clear evolutionary trends emerge from this detail. One is that the Philippine Leafbird, probably long isolated on a few islands of the southern Philippines, has taken the classical oceanic-isolate route of reducing sexual dimorphism through loss of ornamentation; indeed, with its lack of a contrasting jawline flash, it could even be said to be neotenic. The Yellow-throated Leafbird, alone in the western part of the Philippines, is on its way to losing plumage ornamentation, but it still retains features that link it with its more typical Asian relatives. The inference here is that, in some lines at least, male ornamentation carries, or has carried, a fitness cost. Parsimony, backed by the weight of species numbers, would then interpret female masklessness and the universal plainness of juveniles as ancestral in the family. If this is so, cock-type plumage among females is a derived character, evolved independently in offshoots of what appear to be two different superspecies.

Among strictly maintenance characters, the authors of the genus *Chloropsis* mentioned variation in bill shape. This seems then to have been forgotten, but it is real and unexpectedly informative. Jerdon's, Golden-fronted and Orange-bellied Leafbirds and, to a less obvious extent, the Blue-masked Leafbird all have a bill that is more than ordinarily long and slender, is lightly decurved along both profiles, and has the upper cutting edge smooth throughout, with the mandibles tapering to meet precisely, tip to tip. In most other taxa, the bill is proportionately heavier, and straight to very slightly recurved along the lower profile, while the cutting edge of the upper mandible is obviously notched near its tip, with a prominent nail that curves or hooks beyond the tip position of the lower mandible. The Sumatran Leafbird only just fits into this second camp, and the Blue-winged Leafbird alone is properly intermediate, with a minute notch and barely noticeable nail development.

Drawn thus, bill-type boundaries cut through proposed superspecies. For example, the heavy-billed, nail-tipped Bornean Leafbird is particularly different from its Blue-winged Leafbird neighbour, and the bills of both maskless species are conspicuously nailed, the Philippine Leafbird's bill being as prominently hook-tipped as that of the powerful Greater Green Leafbird. Either adaptations for foraging have been plastic in leafbirds, or chloropseid taxonomy above species level requires re-examination.

Bill-shape variations imply differences at least in foraging emphasis, with some associated variation to be expected in, say, tongue morphology. Specimens of seven species, however, showed this not to be the case. These were the Golden-fronted, Orange-bellied and Jerdon's Leafbirds in the slender-billed category, the nail-billed Greater Green, Lesser Green and Yellow-throated Leafbirds, and the intermediate Blue-winged Leafbird. All showed essentially one tongue type: dorsally concave, or channel-sectioned, with the tip produced into a keratinous brush lying in the concavity of the outer lower mandible. Two features varied. The first of these was the length of the brush beyond the extreme fleshy tip of the tongue, being close to 6 mm and 8 mm respectively in the Golden-fronted and Orange-bellied Leafbirds, 4·6 mm in Jerdon's, 3·5 mm in the Blue-winged, and 2·2–4·4 mm in the rest, up to the size of the Greater Green Leafbird. The second was the projection of the horns of the hyoid support of the tongue, lying free over the base of the braincase; they reached far up the rear of the skull in Golden-fronted and Orange-bellied Leafbirds, but over only its basal quarter in the rest. These differences are taken up again below (see Food and Feeding).

Habitat

Other than arid-zone thorny acacia (*Acacia*) woodland, all the major divisions of natural broadleaf forest in the Oriental Region that support well-grown trees harbour one or more leafbird species. In inner tropical South-east Asia this extends even to the landward, or "back", zones of mangrove forest, although, in recent decades, most of that particular habitat has been lost to new land uses. So far as altitude is concerned, the Orange-bellied Leafbird occurs to 2400 m in the eastern Himalayan foothills and Yunnan, and to at least 2000 m elsewhere in south China, at which elevation broadleaf forest overwinters deciduously, forcing affected populations to migrate downslope. At lower latitudes, this species ranges to much the same upper altitudinal limit, but in more equable, evergreen conditions that are inhabitable throughout the year. In Peninsular Malaysia, it reaches 1900 m and stays entirely within montane forest. Neither the Bornean nor the Blue-masked Leafbird, the mountain chloropseids of Borneo and Sumatra, respectively, is known to range as high as does the Orange-bellied Leafbird, even though equivalent tall forest is open to them on both of these islands.



All members of the family eat fruit, with figs and soft-fleshed berries being the main target. Although small items are swallowed whole, some leafbirds have been recorded using a distinctive fruit-processing technique for medium-sized berries. First, these are speared on the lower mandible and rotated. Then, as seen in the accompanying photograph, they are squeezed in the bill. After the loosened contents are sucked in, the rind is discarded. It is likely that the grooved and brush-tipped tongue assists in channeling fluids into the throat. In addition, the closed bill tip of the ***Orange-bellied Leafbird****, amongst others, has a U-shaped groove through which the tongue protrudes.*

[*Chloropsis hardwickii malayana*, Fraser's Hill, Malaysia. Photo: Ong Kiem Sian]

Seasonal, monsoon forests of the plains and lower slopes in south and outer South-east Asia that are quasi-deciduous to fully deciduous hold Golden-fronted Leafbirds and, in India and Sri Lanka, also Jerdon's Leafbirds, the latter veering towards drier, more open habitats and showing a greater preference than does the Golden-fronted for edge and disturbed conditions. There are also populations of Golden-fronted Leafbirds that live in near-evergreen forest, and in and eastwards from the far north-east Indian Subcontinent Golden-fronted and Blue-winged Leafbirds share a set of lowland and submontane forest habitats that have a greater humidity than is tolerated by Jerdon's Leafbird. Breeding habitats are partitioned by altitude but, seasonally, probably all three species make some contact as well with non-breeding Orange-bellied Leafbirds, the latter descending to lower elevations in winter. From as far east as north Vietnam, records exist of groups of two or more of these species merging at an occasional source of food that they had in common.

Southwards, all lowland South-east Asian chloropseids are inhabitants of evergreen forests, from mature, with a closed canopy, to those that are selectively disturbed but still retain much tall timber. Probably, all range out temporarily into well-grown secondary forest, wooded gardens and small clearings in the vicinity of the original stand, but in the Sunda region only the Blue-winged Leafbird makes priority use of edge and secondary conditions. The Greater Green Leafbird reaches lowland freshwater swamp-forest, and this is the leafbird formerly found in back mangroves. Towards the upper limits of their ranges, these species and others all approach the ecotone with montane forest. Locally, and for a short distance, especially where disturbance has occurred, they may cross it.

No member of the family forages or nests in narrow-leafed conifers, although Sumatran Leafbirds were collected from a small patch of broadleaf vegetation isolated within a forest of the pine *Pinus merkusii*.

General Habits

In whatever type of woodland or forest they happen to occupy, leafbirds live at canopy level, right at the foliage "skin" and up to the very pinnacle of emergents, the latter being a favoured songpost of the Orange-bellied Leafbird and others. They obtain all food and fluids aloft, and they also bathe there, using, where available, water cupped into a rotted-out bough end or knothole. Only under drought conditions, or in occasional pursuit of some large arthropod dropping out of high foliage, do they make brief visits to the ground. Not surprisingly, as a consequence of this canopy-dwelling lifestyle, the general behaviour of this family is relatively little known.

Probably all leafbirds disperse to breed, and they may then behave territorially, if only in respect of some temporary food source. H. C. Smith recounts an observation of his in north Myanmar, when two male Golden-fronted Leafbirds actually fell to earth while locked in combat. On the other hand, widely in south Asia and through the northern outer tropics non-breeding Jerdon's, Golden-fronted, Orange-bellied and Blue-winged Leafbirds have all often been described as forming parties that forage socially; one report from Sikkim, by S. Ali, was of over 50 Orange-bellied Leafbirds together in a flowering *Bassia* shrub. As stated, such gatherings occasionally include more than one species. Scraps of information published on the Sumatran and Blue-masked Leafbirds imply that, at times, these southern island endemics, too, forage socially, in groups likely to be larger than family parties, although confirmation of just about any aspect of the behaviour of this under-observed pair in the wild would be welcome.

With potential exceptions in upland Sumatra, the growing impression is of a broad behavioural divide between the leafbirds of western and northern parts of the family's range and those of humid forest environments of inner tropical South-east Asia, including the Sunda region. There, the typical social unit while foraging, at all times, comprises one bird or a pair, but never more than a potential family party, and this applies equally to low-latitude populations of the widespread Blue-winged Leafbird. Among lowland species visiting fruiting shrubs in a clearing of Pasoh Research Forest, in Peninsular Malaysia, A. Coates observed an adult male Blue-winged Leafbird as it aggressively defended a small fruiting shrub against conspecifics of all age/sex-classes, and noted that individual male Greater Green Leafbirds systematically chased away all other leafbirds of all species. The Orange-bellied Leafbird, the second widespread, di-



Like most leafbirds, ***Jerdon's Leafbird*** *is a generalist, consuming large numbers of insects, but augmenting them with fruit and nectar. The insect portion of the diet is often sought acrobatically in leafy canopies, while nectar is taken from a variety of flowers. Indeed, non-breeding individuals are known to trap-line nectar sources in groups. Amongst the flowers visited by Jerdon's Leafbirds are those of the coconut palm* (Cocos nucifera)*, pictured here, a plant which is grown commercially in abundance throughout much of south India and Sri Lanka.*

[*Chloropsis jerdoni*, Sri Lanka. Photo: Greg Dean]

vide-crossing species, has made a similar behavioural shift on the Malaysian mountains, where no forager gatherings are known and where the arrival of extra birds, especially adults, in a pair's activity space always generates much agitation, song and aggressive posturing. As an inevitable exception, a group of seven Bornean Leafbirds encountered together on Mount Mulu, in Sarawak, bends this "rule", but still the party included only two black-masked adults. With this species, too, loners or a pair are the foraging norm.

Voice

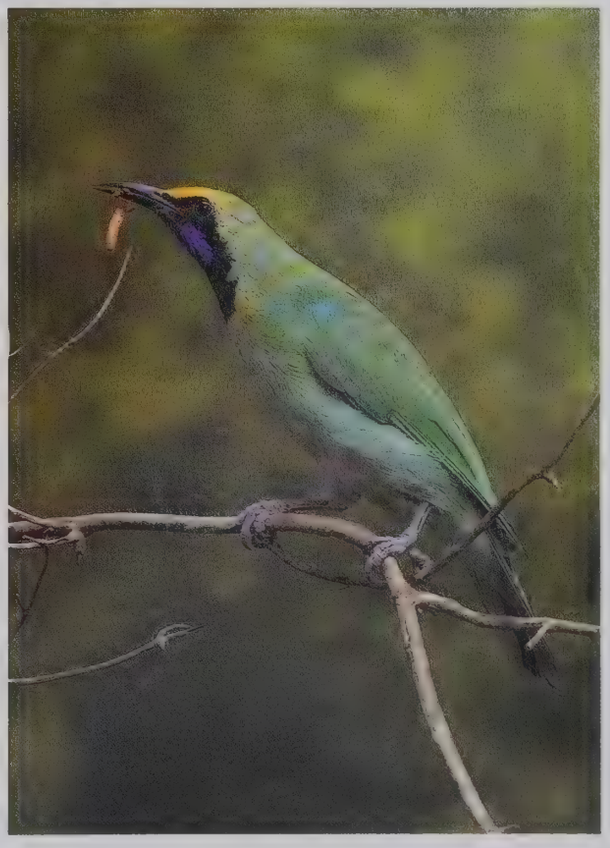
Those chloropseids that are confined to South-east Asian islands, constituting about 40% of leafbird species, are almost unknown vocally, at least in the wild. All the rest are rich, relatively powerful singers, their sustained outputs, containing liquid warbles, strident, resonant inflections and numerous doublings, being fairly easily marked down to family by an experienced listener. At species level, the story is different. Beyond comparing generalized pitch, "sweetness", stress, duration, and the like, no ornithologist appears yet to have found a way of separating leafbird songs succinctly and dependably by means of their structure. More to the point, no two genuinely independent transliterations of the songs of a given species seem ever to match more than vaguely, unless taken from the same localized population, and even then matches can be loose. It follows that descriptions in the literature, copied on, as they often are, from source to source, have limited value as tools in field identification.

This difficulty is explainable in two steps. The first is the exceptional capacity of leafbirds to mimic, an ability that, as aviculturalists keeping such species as Golden-fronted and Orange-bellied Leafbirds have long known, is carried into adulthood and, in captivity at least, extends beyond avian models. The second is the guess that, even by higher-passerine standards, very few song elements of chloropseids are hard-wired. Apart from sound quality and general rhythmic structure, evidently, song is acquired by copying not just the vocalizations of the parental generation but also sounds from the acoustic environment in general. Leafbird songs, often prolonged, complex, and returning to a particular motif only at intervals, are perhaps mostly mimetic, built up selectively over time to the point at which they may well be recognizable individually. What kind of sexual or other selective advantage is accrued by this has not been investigated, and the matter is complicated by the fact that, in the case of the Orange-bellied Leafbird and almost certainly some others, both sexes, including pair-members, sing.

"Selectiveness" of mimicry is open to subjective assessment by observers impressed by the leafbirds' reproduction of cer-

Large leafbirds with nail-tipped bills are capable of capturing locust-sized orthopterans and mantids, but those species with finer, hookless bills, such as the ***Golden-fronted Leafbird****, are restricted to smaller fare. Their invertebrate intake is largely made up of caterpillars, other insect larvae and spiders. In addition, when winged prey such as lepidopterans are flushed, these are often pursued in short aerial sallies, as are swarms of alate termites emerging en masse after rain. Larger insects are subdued with difficulty, as leafbirds seem not to swipe their prey against branches, but merely to squeeze them rhythmically with the bill.*

[*Chloropsis aurifrons*. Photo: Tony Tilford/Oxford Scientific Films]





Leafbirds tend to place their simple cup-shaped nests near the tips of branches, often suspending them hammock-style from thin twigs in the high canopy. The nest of this ***Jerdon's Leafbird*** *is a rather messy affair, showing little sign of afterthought. In many cases, however, the exterior is swathed in cobweb silk, often with pieces of bark, lichen or bryophyte added as camouflage. Taking the family as a whole, standard clutch size in the tropics is two eggs, with the incidence of three-egg clutches increasing towards temperate regions. In aviaries, eggs hatch 13–14 days after laying, and chicks fledge 12–15 days after hatching, although it is difficult to predict how the duration of these periods is affected by factors such as diet and microclimate, both of which are sure to be somewhat different in captivity as compared with the wild.*

[*Chloropsis jerdoni*, Sri Lanka. Photo: T. S. U. de Zylva/ FLPA]

tain kinds of call, compounded by the copying-on of particular statements in the literature. It is unlikely, for instance, that all Jerdon's Leafbirds make a habit of stirring up the local avian community by uttering precision copies of Shikra (*Accipiter badius*) calls. Nevertheless, some groups of models are mentioned repeatedly, across species, implying that certain types of sound may be copied preferentially. Drongos head this list, with common mention of Black (*Dicrurus macrocercus*) and White-bellied Drongos (*Dicrurus caerulescens*) being mimicked by Jerdon's Leafbird, and the Bronzed Drongo (*Dicrurus aeneus*) by both Golden-fronted and Orange-bellied Leafbirds. A recent report from Fraser's Hill, on the Main Range in Peninsular Malaysia, on the other hand, adds a new and confusing dimension to the story. In this instance, sustained, full-blown song of what was thought to be an Orange-bellied Leafbird was tracked down to a Bronzed Drongo.

It is hardly surprising that the songs of leafbirds are not considered likely to contain much information of phyletic interest. P. C. Rasmussen has suggested that more might be extractable from their various simpler contact calls, and this possibility merits further investigation. Attention has been drawn to the similarity of the three-note "trick-or-treat" calls of the allopatric Yellow-throated and Philippine Leafbirds, and to the "chick-weeeep" of the latter species compared with the common "kwip-kweep" contact call of the Blue-winged Leafbird, a potential continental relative. At the same time, one of the mimicked sounds most often reproduced by Orange-bellied Leafbirds in Malaysia, as well as, apparently, in the eastern Himalayas, is the loud "chittik" flight call of the Streaked Spiderhunter (*Arachnothera magna*), commonly given by the leafbird as its own signal at take-off.

Food and Feeding

A cross-checking of sources makes it clear that the leafbird species for which there are reasonable data on foraging feed on animals. In all cases, they glean arthropods from outer-canopy branchlets and foliage, often moving acrobatically in order to counter the weight of the body on thin stems. The Golden-fronted Leafbird is also reported as being able to hover-glean, and another way in which this species and the Orange-bellied Leafbird search for hidden prey is by inserting the slender, nailless (see Morphological Aspects) bill tip between stuck-down leaves and then opening the mouth.

Chloropseid diets comprise spiders and insects. Items taken by the nail-billed species range up to locust-sized orthopterans and mantids or, in the case of the Blue-winged Leafbird, equivalently large caterpillars. The birds subdue the biggest and toughest prey, with difficulty, by working them through the bill, rather than swiping them on a branch. Items flushed by disturbance are chased, in extreme cases down to the forest floor, and they may actually be subdued on the ground, as has been observed for the Greater Green Leafbird. At regular foraging levels, high in the canopy, lepidopterans, winged termites (Isoptera) and similar prey are taken aerially, in short pursuit-flights.

Among the various leafbird species, the shape and size of the bill are presumed to influence prey-capture and prey-manipulating techniques. No diet is documented completely enough to substantiate that for certain, but, interestingly, of the six leafbird species reported as regularly joining mixed-species flocks of foraging insectivores that flush prey by general disturbance, five have a nail-tipped bill.

F. R. Lambert considered that Blue-winged Leafbirds of the Kerau Wildlife Reserve, in Peninsular Malaysia, took figs (*Ficus*) only incidentally, while detouring from mixed flocks of insectivores as these happened to pass close to a crop. This species visited many fewer kinds of fig than did co-occurring Greater and Lesser Green Leafbirds, but all of the better-known leafbird species take significant amounts of fruit, in addition to their animal foods. Figs and small-seeded, soft-fleshed berries are the main target and, once again, bill morphology would be expected to affect the food-handling procedure. In this instance, however, the nail-billed Greater and Lesser Green Leafbirds share a special fruit-processing technique with the Blue-winged, Golden-fronted and Orange-bellied Leafbirds and, as future research is likely to reveal, probably with others. Particularly small items or cuttable pieces of large fruits are swallowed whole, but medium-sized berries are routinely speared on the lower mandible, at the stalk end, and their contents loosened by rotation. The fruit is then clamped and squeezed in the bill, the loosened contents are sucked in, and the empty rind is discarded. With side ridges pressed against the interior of the upper mandible, the brush-tipped, grooved tongue (see Morphological Aspects) is certain to help in channelling fluids into the throat. At least in the Orange-bellied and Golden-fronted Leafbirds, which possess long hyoid horns, the tongue is also known to be protrusible, and is protruded while fruit is being eaten. Further, it so happens that the lower mandible of these two species and Jerdon's Leafbird, but not that of any of the others examined, ends in a fine, open "U" through which a brush tip could pass while the bill is still closed.

This last adaptation introduces the third leafbird foraging element, that of flower-visiting. Claims of the importance, or even the dominance, of nectar in leafbird diets are commonplace in the literature of the southern Asian and outer tropical parts of the family's range. It is regularly asserted, for example, that leafbirds are most often seen at clumps of *Loranthus* mistletoes; that they are inseparable from parasitic *Loranthus*; and that they are found at the blossoms of the plants *Bassia*, *Helicteres*, *Salmalia*, *Erythrina*, *Firmiana*, *Bombax* and *Cocos*. Moreover, H. T. and J. C. Caldwell, in their 1931 book on the birds of south China, relate how every specimen of Orange-bellied Leafbird that they collected in the Fujian uplands was caked around the face with pollen. Flushes of nectar-rich flowers on large crowns in these areas certainly do attract leafbirds, socially, in the non-breeding season, and between sources parties probably practise trap-line feeding. This behaviour has led to assertions, such as that by Ali and S. D. Ripley, that "all [leafbirds] are important flower-birds... responsible for pollinating the blossoms of numerous species of trees and shrubs in their quest for nectar". This statement, although likely to be true, is still an assumption, as indeed is the "quest for nectar", rather than for the insects that nectar attracts. Indeed, it would be an exaggeration to claim that all leafbirds are committed flower-visitors. The behaviour applies to northern populations of the intermediate-billed Blue-winged Leafbird and, without question, to the Orange-bellied, Golden-fronted and Jerdon's Leafbirds, which happen also to be the ones possessing a slenderly pointed, open-tipped bill and a long-brushed tongue; but it relates to these taxa alone.

The ornithological literature on inner South-east Asia, covering a longer list of leafbird species, contains no such statements; indeed, there is barely a mention of flower-visiting behaviour. A pair of Greater Green Leafbirds visited a Bornean *Loranthus* mistletoe and probed its tubular corollas, and in Peninsular Malaysia H. E. McClure recorded instances of Greater Green and Blue-winged Leafbirds at similar blossoms of *Aeschynanthus*, an epiphytic gesneriad of rainforest, which they robbed by puncturing its corolla bases. Both Blue-winged and Lesser Green Leafbirds have also been seen there at inflorescences of the introduced gum *Eucalyptus deglupta*, and in Borneo G. W. H. Davison found Blue-winged Leafbirds at the honey-scented, insect-attracting flowers of *Rhodamnia*, a small forest-edge tree of the same family. These examples come close to the sum of references, from which it appears that the region's leafbirds visit flowers intermittently but are by no means the dedicated nectar birds described above. Apart from the Blue-winged Leafbird and the unstudied Blue-masked Leafbird, of course, they represent the nail-billed section of the family.

Breeding

The breeding habits of three species are reasonably well known. About three others nothing at all is known, and for the remaining five species only a few data are available. Projecting from this partial information, it seems that chloropseids are among the few passerines of tropical forests, at least in Asia, that do not seek to nest in the shelter and relative constancy of micro-climate of the lower shade layer. Their nests are always located towards the outer end of a lateral branch high in the tree crown. This is the normal practice of Jerdon's Leafbird and the Golden-fronted Leafbird, the two species inhabiting more open woodland, and it follows that, in rainforest, some, and perhaps even most, building occurs above the listed 20 m maximum for the family.

It is little wonder, then, that so few nests of leafbirds have ever been found by ornithologists, let alone described in any detail. Those that have been discovered show a uniformity of form and construction. They comprise an open cup, shallow to moderately deep, built from a mixture of fine stems, tendrils, leaf parts and the like, and "rootlets", the last being a term frequently employed to cover a variety of unidentified material that may sometimes include fibrous aerial root parts. The structure is suspended hammock-wise from thin, leafy twigs, including thin prongs of a fork, which pass through the rim; it is felted externally with cobweb, some of which helps to anchor the nest; and is camouflaged with bryophytes and lichens. Only one instance of a different type of nest is on record. This apparently aberrant structure, from north-east India, was an open cup built directly on to the surface of a bough reputedly by a Blue-winged Leafbird.



*The **Yellow-throated Leafbird** is endemic to the island of Palawan, making it a Restricted-range species. Despite this limited distribution, it is not red-listed or even considered Near-threatened because its population is apparently healthy in intact forest and secondary growth. Nevertheless, forest loss on several more developed Philippine islands has been catastrophic, and, if Palawan follows suit, all of its endemic forest fauna will be driven towards extinction. The situation requires monitoring, and reserves that have been established to protect the island's native habitats must be carefully conserved.*

[*Chloropsis palawanensis*, Palawan, Philippines. Photo: Roland Seitre]



*Of all leafbirds, the **Blue-masked Leafbird** is the smallest. The adult male is a spectacular bird, with intense flashes of violet, indigo and aquamarine on the head. The female, pictured here, is rather more subdued. It occupies a relatively narrow elevational band in the Barisan highlands of Sumatra, reaching peak abundance at altitudes around 1000 m, and it seems to be naturally uncommon. Given these facts it is treated as Near-threatened, although it faces no immediate risk because forest in its elevational range remains relatively secure, at least away from roads. Moreover, this species tolerates a certain degree of habitat degradation.*

[*Chloropsis venusta*. Photo: Stan Osolinski/ Oxford Scientific Films]

As far as is known, and in keeping with their aggressiveness, leafbird pairs space themselves out to breed, although most descriptions of reproductive behaviour derive from observation of captive pairs in aviaries. Courting male Orange-bellied Leafbirds fluffed out the dorsal plumage, opened and shivered the wings, exposing the shining blue lesser wing-covert patch, and vocalized, but the calls, unfortunately, are undescribed. Exposing of the wing-covert patch by this and other species also occurs in threat behaviour. Male Golden-fronted Leafbirds performed acrobatically, frequently hanging below the female's perch, and, in Thailand, a courting bird of unspecified sex was observed to crouch while flapping its wings over the back and fanning out its tail. These species, and also a male Sumatran Leafbird, fed their pre-laying mates, and only the females incubated, a hen Sumatran Leafbird starting from the laying of her first egg.

On limited evidence, the predominant clutch size of the family is two eggs, no more than this number having yet been recorded for any inner-tropical representative investigated. This includes the Sumatran Leafbird, the only recorded clutch of which was laid in an aviary in Germany. Three-egg clutches are known, and may even be regular, in northern parts of the ranges of Jerdon's, Golden-fronted and Orange-bellied Leafbirds, and have also been reported a few times for Blue-winged Leafbird but, again, only in the far northern part of that species' range.

All known eggs of chloropseids are ovate in shape, longish to regular or, in the case of the Greater Green and Orange-bellied Leafbirds, broad. Those of the Blue-winged Leafbird in north-east India are creamy white to white, with pinkish, purplish-brown or black speckles and pencil markings over the broad cap or in a blurred zone around it. These markings are all black in Javan examples. Eggs of the related Jerdon's Leafbird are similar, with a sparing spread of speckles and pencillings of pinkish-brown to dark brown, or reddish, purplish and black, mainly over the broad end. The Golden-fronted Leafbird's eggs differ in being creamy to pinkish cream, with lavender and red-brown freckles and flecks, rather than pencil marks, all over to mainly over the broad end. Interestingly, two Sumatran Leafbird eggs were quite similar, cream with irregularly sized and shaped light red-brown flecks all over, but densely packed only over the broad pole. The pattern of the Orange-bellied Leafbird's eggs is also close to that of the Golden-fronted and Sumatran, but the speckling is said to be darker on average. A single Greater Green Leafbird egg, from north-east Sumatra, is creamy white, finely and densely speckled all over with pinkish-red to purplish-red, with larger flecks of the same colours over the broad end, and more generally scattered flecks of lilac-grey. Across the family, recorded egg size ranges from that of the Sumatran Leafbird, at 26 × 16 mm, down to that of Jerdon's Leafbird, at 23·1–19·3 × 15·8–14·3 mm, but eggs of some Orange-bellied Leafbirds of the nominate race have a width of up to 17·5 mm, and those of the Greater Green Leafbird can be at least 18·2 mm wide. These figures exclude the undescribed eggs of the Lesser Green and Blue-masked Leafbirds, which are presumed to lie at the small end of the scale.

The only data on incubation and fledging periods are, again, derived from observations of pairs in aviaries. These indicate that the Golden-fronted Leafbird incubates for 14 days, the Sumatran for 13–14 days, the Blue-winged for 13·5 days and the Orange-bellied Leafbird for 13 days. The fledging period of the Golden-fronted Leafbird is 15 days and that of the Orange-bellied Leafbird is 12 days, but fledging periods affected by diet in captivity may not, of course, exactly match those in the wild.

Movements

Orange-bellied Leafbirds of the Himalayan foothills migrate altitudinally, making post-breeding downslope shifts of 1000 m or more, to as far as plains level in Assam. At least those populations of this leafbird living towards the outer limit of the species' distribution, in south China, are liable to make similar movements. On the same Himalayan slopes, but at a lower extreme elevation and over shorter distances, marginal populations of the Golden-fronted Leafbird behave likewise.

The only other supposed long-distance movement, claimed by E. C. Stuart Baker in the early decades of the twentieth century, is of "irruptive" Blue-winged Leafbirds invading the hills of Assam from, it was presumed, Myanmar. Stuart Baker stated that many of these overwintered in Assam, and a few bred in certain years, separated by blocks of years with no reports at all. Stuart Baker's record seems to be the only one of this nature, and none of the recent ornithological literature dealing with the Indian Subcontinent makes mention of it.

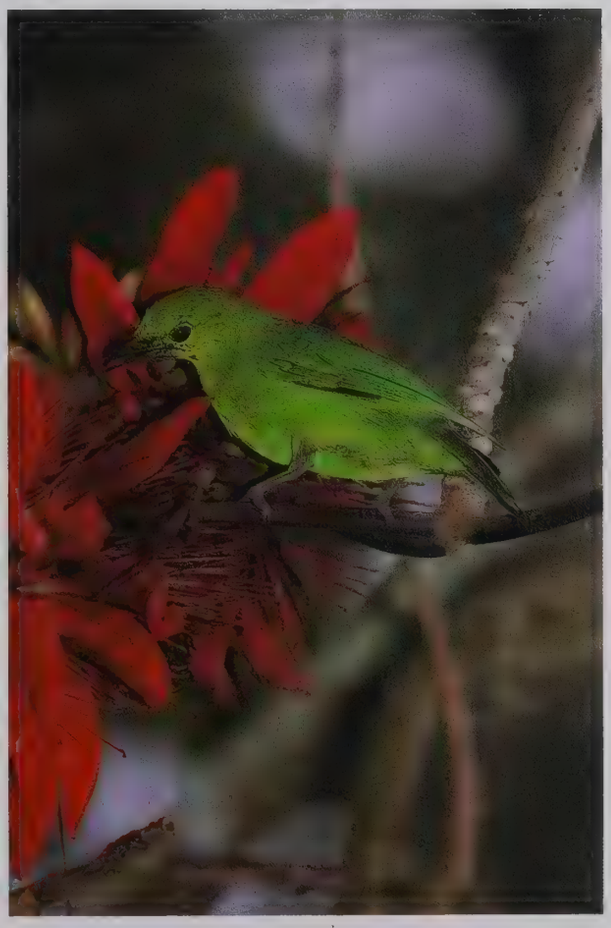
Otherwise, leafbirds are thought to be sedentary. Even so, it may be supposed that regular flower-visitors disperse locally, and they may trap-line around scattered, traditional but intermittent sources of nectar (see Food and Feeding). These are the species

that, when not breeding, forage collectively, and apparently also travel in groups, as do, for example, trap-lining Asian Fairy-bluebirds (*Irena puella*).

Relationship with Man

All leafbirds are spectacular in appearance. As stated earlier (see Voice), most, and probably all, are also prodigious singers, incorporating much material into their songs by accurate mimicry well into adulthood. Although notoriously aggressive towards conspecifics and others in aviaries, when alone in a cage they are tamable and tractable, natural acrobatic behaviour converting quickly to simple trick routines. In addition, because of the fruit component of the diet, most or all of the species are relatively easy to maintain. It is no surprise, therefore, that leafbirds are traditionally favoured cagebirds. A scan of the more important western avicultural literature of the past 20 years revealed no fewer than 26 papers devoted exclusively to this group, and covering all except the two Philippine species, although with strong emphasis on the Golden-fronted and Orange-bellied Leafbirds. The extra-regional trade in wild-caught birds, moreover, must be small in proportion to that conducted within Asia itself. The Orange-bellied Leafbird is a firm favourite as a cagebird in, for example, Assam, and the Golden-fronted Leafbird far more widely so. The standing population of captives of these two alone must be vastly greater in Asia than the number found in the totality of western foreign-bird aviaries, including those of zoos.

In the field, the aggressiveness of leafbirds, together with the attraction of certain species to flowering crowns, makes these birds particularly easy to take in a cage-trap with a decoy raised into the canopy on a long pole. Such techniques are traditional and, as an outcome, many populations of the Golden-fronted Leafbird, in particular, have been depressed by overhunting for the pet trade. Comments on the decline in numbers around Calcutta, in India, for example, were being published well before the Second World War, and in 1936 Satya Churn Law described the Calcutta market trade in this species as "astonishingly huge".



Many leafbirds are essentially common forest-dwelling species, but their reliance on a disappearing habitat means that their populations are declining, along with their prospects of long-term survival. The ***Lesser Green Leafbird*** *is one such species, a denizen of South-east Asia's vanishing evergreen forests. Even though it occurs in secondary habitat, and at least marginally into the submontane zone where habitat loss is less severe, the sheer scale of recent forest clearance in the Sundaic region means this species must have suffered a drastic decline. It is listed as Near-threatened.*

[*Chloropsis cyanopogon*, Taman Negara, Malaysia. Photo: Ong Kiem Sian]

Damaging numbers of leafbirds are also captured in South-east Asia, including Thailand. During 26 months of weekly surveys of one major city market, the Bangkok "Sunday Market", in the late 1960s, McClure and S. Chaiyaphun conservatively estimated 4400 "aegithinids" on sale, apparently predominantly Golden-fronted Leafbirds. Over 900 individuals of this one species alone were logged in their 1968 survey.

Status and Conservation

Most leafbird species are still a fairly common sight in appropriate habitat, except in areas where their numbers have been reduced by sustained trapping (see Relationship with Man). Only the Blue-masked Leafbird is believed to be rare naturally, but dedicated fieldwork on its native Sumatran slopes may show even that to be untrue. It is currently listed as Near-threatened.

In various parts of their ranges, Blue-winged, Jerdon's, Golden-fronted and Orange-bellied Leafbirds extend into secondary vegetation, orchards and even wooded gardens, and probably most species exploit the mass fruiting of pioneer vegetation colonizing gaps made in tall forest. In certain circumstances, therefore, members of this family may actually benefit from the medium-term outcome of limited, selective disturbance of forest, including that by logging, except that, unfortunately, fruit sources such as lianas and the local canopy-fruiting fig community are often the targets of subsequent silvicultural "treatment".

At root, however, all leafbirds are forest-dependent. Even though, as all are canopy birds, none is vulnerable to the microclimate shock that logging of evergreen stands imposes on the shade-layer fauna, all lowland species have disappeared from huge parts of their former ranges within the last century or so, and particularly over recent decades, as a result of clearance of habitat. The Red Data Book listing of the Philippine Leafbird, believed to have been reduced to a handful of population pockets on Mindanao and perhaps still on Samar, but extinct on Cebu and probably also on Leyte, is due to this loss. This species is classified as Vulnerable. Two others are currently listed as Near-threatened: the Blue-masked Leafbird of Sumatra is mentioned at the start of this section; the Lesser Green Leafbird, is still more or less common, but it has disappeared from much of its former range as a result of substantial forest clearance. At a lower taxonomic level, some subspecies of other chloropseids, such as the Javan races of the Blue-winged and Greater Green Leafbirds, must now be in a considerably worse state.

Much depends on the capacity of these and other lowland leafbirds to sustain populations on slopeland. Throughout tropical Asia, this is where most of the forest habitat that has survived the current harvesting onslaught is becoming isolated and, indeed, where most of it occurs in parks and reserves.

Also for habitat reasons, and trapping notwithstanding, the chloropseid that is doing best overall has to be the mainly montane Orange-bellied Leafbird. Despite the fact that it is caught in large numbers for the cagebird trade, this species appears to be common and thriving in many parts of its relatively large range. Indeed, Hong Kong ornithologists believe that increasing numbers settling hill woodland of the territory constitute natural spread or, possibly, recolonization from nearby areas, a bold claim for any bird species in south China.

General Bibliography

Ali (1962), Ali & Ripley (1996), Ammermann & Schneider (1986), Barker *et al.* (2001), Bock (1994), Chasen & Hoogerwerf (1941), Collar *et al.* (1999), Dickinson *et al.* (2003a), Dunn (1974), Étchécopar & Hüe (1983), Gibson (1981), Grimmett *et al.* (1998), Harrison (1999), Holmes (1996), Kennedy *et al.* (2000), Kraus (1986), Lambert (1989b), Lekagul & Round (1991), van Marle & Voous (1988), Mayr & Greenway (1960), McClure (1967), McClure & Chaiyaphun (1971), McGregor (1909–1910), Medway & Wells (1976), Meyer de Schauensee & Ripley (1940), Rasmussen & Anderton (2005), Robinson (1927), Robinson & Kloss (1918, 1924), Robson (2000), Round (1988), Sheldon *et al.* (2001), Sibley (1996), Sibley & Ahlquist (1990), Sibley & Monroe (1990), Smythies (1999), Stuart Baker (1922–1930, 1932), Wait (1925), Wells (1985a, 2005), Wells *et al.* (2003b), Wetmore (1960).



PLATE 27

inches 4
cm 10

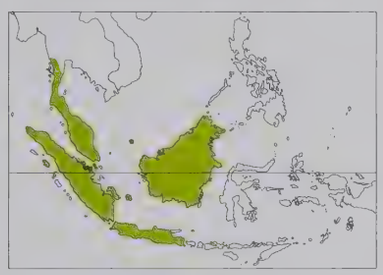
Genus *CHLOROPSIS* Jardine & Selby, 1827

1. Greater Green Leafbird

Chloropsis sonnerati

French: Verdin de Sonnerat **German**: Dickschnabel-Blattvogel **Spanish**: Verdín de Sonnerat
Other common names: Greater/Malachite-shouldered Leafbird

Taxonomy. *Chloropsis Sonnerati* Jardine and Selby, 1827, Java.
Named race *parvirostris*, from Nias I (off W Sumatra), merged with *zosterops*, as its bill characters fall within range of variation of mainland populations. Two subspecies recognized.
Subspecies and Distribution.
C. s. zosterops Vigors, 1830 – S Myanmar (C Tenasserim) and SW Thailand S to Sumatra and satellites, E to N Natuna group and Borneo.
C. s. sonnerati Jardine & Selby, 1827 – Java.



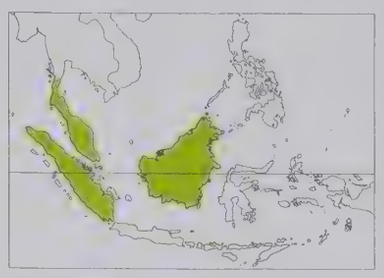
Descriptive notes. 18–21 cm; male 42·9–48·2 g, two females 38 g and 41·2 g (*zosterops*). Largest and heaviest leafbird, with relatively long, powerful, hook-nailed bill. Male nominate race has lores, face (enclosing part of eye) and chin to upper breast black (shape of bib varying individually), lustrous cobalt-blue flash along jaw from below angle of mouth; turquoise patch on lesser upperwing-coverts, straw-yellow outer webs of primaries P5–P8; rest of plumage rich, slightly glossy grass-green, a shade paler below; iris dark brown; bill blackish; feet slate-coloured with blue to greenish tinge. Female lacks black mask, has paler blue jawline flash, and bright yellow chin, throat and narrow eyering. Juvenile resembles female, but with yellow streak behind mouth, no jaw flash. Race *zosterops* differs from nominate only in being slightly less bright green, with wing-covert patch viridian-green rather than turquoise. Voice. Song a varied sequence of powerful, liquid, warbling phrases, e.g. "wit-chew", "wee-wu", "weet-weet", "wee-twit-twit", "chew-prrt-prrt-chew" and similar, interspersed with chattering, e.g. "wi-i, chaka-wiu, chi-wiu", and with much mimicry, including of Asian Fairy-bluebird (*Irena puella*) calls.
Habitat. Canopy and high edge of lowland evergreen forest and peatswamp-forest, well-grown secondary forest, also mature and well-regenerated tall back mangroves (now a rare habitat); occasionally also heavily wooded parkland and tree-shaded plantations, and visits fruit crops in isolated trees and shrubs of clearings. Sea-level to 900 m in N Malay Peninsula, and to 1100 m elsewhere, with some wandering into extreme base of lower montane forest.
Food and Feeding. Generalist; diet arthropods and fruits, also flower nectar. Animal prey gleaned from foliage, include large orthopterans (to size of locust), mantids, stick-insects (Phasmida) and caterpillars; chases flushed items. Fruits include canopy figs (*Ficus*) of many species, diameter up to 35 mm, also numerous smaller berries. Small fruits and small pieces of large fruit eaten directly; intermediate-sized, tough-coated items are pierced, and the contents then loosened and squeezed out by using the bill. Recorded at tubular flowers of an epiphytic gesneriad, punctured at base of its corolla for nectar, and at a *Loranthus* mistletoe, but flower-visiting not known to be regular. Forages alone or in pairs; may join mixed-species flocks of insectivores. At times, individual males defend limited sources of fruit (only), vigorously so against other leafbirds, including conspecifics.
Breeding. In N Borneo, males with large testes in mid-Jan, Mar, Jun and mid-Jul and females showing evidence of recent laying in Jun and mid-Oct; nest-building in early Jul and dependent fledglings in Apr and May in Malay Peninsula. Solitary breeder. Nest an open cup cradled between outer twigs of lateral branch, once 6 m up. No information on clutch size or incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Race *zosterops* still more or less common where habitat remains; small population persists on Singapore I (S Malay Peninsula), where, apart from tiny Bukit Timah Nature Reserve and remnant mangroves (latter not or no longer used by this species), all habitat has been secondary for a century. Nominate race, confined to Java, thought now to be scarce, its population fragmented into scattered pockets; no confirmation of any wild-living individuals in adjacent Bali.
Bibliography. Chasen (1924), Dunn (1974), Finsch (1905), Inskipp *et al.* (1996), Jeyarajasingam & Pearson (1999), Lambert (1989b), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), McClure (1966, 1967), Medway & Wells (1976), Mees (1986), Meyer de Schauensee & Ripley (1940), Nash & Nash (1985), Riley (1938), Robson (2000), Sheldon *et al.* (2001), Smythies (1986, 1999), Strange (2002), Stuart Baker (1922–1930), Thompson (1966), Wells (1985c, 2005).

2. Lesser Green Leafbird

Chloropsis cyanopogon

French: Verdin barbe-bleue **German**: Blaubart-Blattvogel **Spanish**: Verdín Gorgiazul
Other common names: Blue-whiskered Leafbird

Taxonomy. *Phyllornis cyanopogon* Temminck, 1830, Palembang, Sumatra.
Two subspecies recognized.
Subspecies and Distribution.
C. c. septentrionalis Robinson & Kloss, 1919 – extreme S Myanmar (S Tenasserim), SW Thailand and N Malay Peninsula.
C. c. cyanopogon (Temminck, 1830) – S Malay Peninsula, Sumatra, and Borneo (including Banggi I, off N coast).



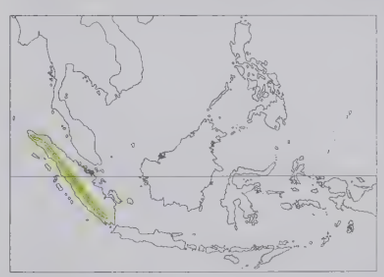
Descriptive notes. 15–16·2 cm; male 20·3–22·8 g, female 18·5–20·5 g (*cyanopogon*). Male nominate race has a trace of brassy yellow on forehead, black facial mask (enclosing part of eye) and chin to uppermost breast, cobalt-blue flash along jawline; viridian-green patch on lesser upperwing-coverts; rest of plumage slightly glossy grass-green, a shade paler below, and brightest narrowly around edge of bib; iris dark brown; bill blackish, or with slaty lower mandible; feet grey to lead-blue. Distinguished from *C. sonnerati* by smaller size, lighter build, yellow on forehead, black of mask usually extending less far down breast, no yellow on primaries. Female lacks mask, has jawline flash paler. Juvenile is female-like, but lacks jawline flash, has yellow eyering and throat. Race *septentrionalis* is on average smaller than nominate, with stronger brassy wash over anterior cap of both sexes, male has narrow but clear yellow border to black bib. Voice. Song a loud, varied sequence of rich warbling phrases including deep, mellow notes and frequent doubled elements.
Habitat. Canopy and high edge of lowland evergreen forest, including peatswamp-forest, mature and regenerating, well-grown secondary forest, also fruiting trees and shrubs of clearings, and high shade cover of plantations; exceptionally, strand woodland on coasts. Sea-level to 700 m on submontane slopes; a few records to 1100 m (i.e. into base of montane forest) in Peninsular Malaysia.
Food and Feeding. Generalist; diet arthropods, fruits, occasionally flower nectar. Arthropods gleaned from canopy foliage, include caterpillars, beetles (Coleoptera), flies (Diptera); chases flushed items. Fruits taken include many types of fig (*Ficus*), to maximum width of 27 mm; among diverse berries, *Eugenia*, *Loranthus*, *Pipturus*, *Callicarpa*, *Muntingia*, *Poikilospermum* species identified. Small fruit items eaten directly; intermediate-sized, tough-coated items are pierced, and the contents then loosened and squeezed out by using the bill. Flower-visiting unusual, but recorded at eucalypt (*Eucalyptus*) blossoms, and seen to obtain nectar of an epiphytic gesneriad by puncturing the tubular flowers at base of corolla. Forages alone or as a pair; often joins mixed-species flocks of other insectivores.
Breeding. Adults with enlarged gonads during late Feb–Aug; an instance of nest-building in late Jun, and nestlings and recent fledglings in Apr and Jun. Solitary breeder. Nest not described, built in outer part of lateral branch high above ground, once 12 m up. Clutch size and incubation and fledging periods not recorded.
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. More or less common where habitat remains, but has disappeared from substantial areas of range as a result of forest clearance. Occurs in several protected areas, including Khao Para-Bang Khram Wildlife Sanctuary (Thailand), Danum Valley Conservation Area (Borneo) and Way Kambas National Park (Sumatra).
Bibliography. Collar *et al.* (2001), Danielsen & Heegaard (1995), Dunn (1974), Inskipp *et al.* (1996), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), McClure (1966, 1967), Medway & Wells (1976), Meyer de Schauensee & Ripley (1940), Nash & Nash (1985), Riley (1938), Robson (2000), Smythies (1986, 1999), Stattersfield & Capper (2000), Strange (2002), Thompson (1966), Wells (1985c, 2005).

3. Blue-masked Leafbird

Chloropsis venusta

French: Verdin à front bleu **German**: Blaustirn-Blattvogel **Spanish**: Verdín Frentiazul
Other common names: Masked Leafbird, Sumatran Leafbird(!)

Taxonomy. *Phyllornis venusta* Bonaparte, 1850, Sumatra.
Monotypic.
Distribution. Upland Sumatra, from Aceh S along Barisan Range to Lampung.



Descriptive notes. 14 cm. The smallest leafbird. Adult male has anterior cap violet-blue, lores and anterior face deep indigo, supraloral fringe and ear-coverts aquamarine-blue, and jawline flash intense violet-blue; rest of head and upperparts grass-green, with leading edge of lesser wing-coverts viridian, edge of carpus bright cobalt-blue, outer half of tail blue; chin and throat deep brown to blackish-brown, breast orange edged yellow, remaining underparts emerald-green; iris red-brown; bill black; feet purplish-brown, yellower on soles. Adult female has forehead, lores, ear-coverts, chin and throat bright blue, outer half of tail dull blue; otherwise grass-green, brighter below. Juvenile undescribed. Voice. Undescribed.
Habitat. Canopy of lowland (submontane) evergreen and lower montane forests, mature and well regenerated; also in forest-edge vegetation around clearings. At 600–1500 m; principally within lower montane zone, c. 1000 m and above.
Food and Feeding. Stomach contents fruit seeds, insects and arthropod eggs. Feeding method undescribed. Regular social unit said to be a pair, but reported a few times in parties of up to six individuals.
Breeding. No information.
Movements. Presumed resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Information on population level deficient; believed generally uncommon to sparse. Continuing loss of forest on lower slopes is restricting this and other species to higher elevations.
Bibliography. Borgstein & Scholtz (2001), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Dunn (1974), Inskipp *et al.* (1996), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Robinson & Kloss (1918, 1924), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Sujatnika *et al.* (1995), Tobias (1995), Wells (1985c).

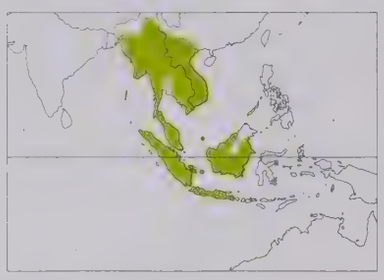
On following pages: 4. Blue-winged Leafbird (*Chloropsis cochinchinensis*); 5. Jerdon's Leafbird (*Chloropsis jerdoni*); 6. Bornean Leafbird (*Chloropsis kinabaluensis*); 7. Yellow-throated Leafbird (*Chloropsis palawanensis*); 8. Philippine Leafbird (*Chloropsis flavipennis*); 9. Golden-fronted Leafbird (*Chloropsis aurifrons*); 10. Sumatran Leafbird (*Chloropsis media*); 11. Orange-bellied Leafbird (*Chloropsis hardwickii*).

4. Blue-winged Leafbird

Chloropsis cochinchinensis

French: Verdin à tête jaune **German**: Blauflügel-Blattvogel **Spanish**: Verdín Aliazul
Other common names: Green Leafbird, Golden-headed/Yellow-headed Leafbird, Gold-mantled Chloropsis

Taxonomy. *Turdus Cochinchinensis* J. F. Gmelin, 1789, Cochinchina; error = Java.
Probably forms a superspecies with *C. jerdoni*, *C. kinabaluensis* and *C. palawanensis*; until recently was regarded as conspecific with first two. The name *nigricollis*, long used for the Javan (nominate) race, has no designated type or type locality, and therefore no formal taxonomic standing. Described races *icterocephala* (from Sumatra), *billitonis* (Belitung) and *natunensis* (Natuna Is) considered better merged with *moluccensis*. Seven subspecies recognized.
Subspecies and Distribution.
C. c. chlorocephala (Walden, 1871) – extreme E Bangladesh and NE India (Assam) E to Myanmar and W Thailand.
C. c. kinneari B. P. Hall & Deignan, 1956 – S China (S Yunnan), N Indochina and NE Thailand.
C. c. auropectus Wells *et al.*, 2003 – SE Thailand and S Indochina.
C. c. serithai Deignan, 1946 – N Malay Peninsula.
C. c. moluccensis (J. E. Gray, 1831) – S Malay Peninsula, Sumatra and satellites and N Natuna Is.
C. c. viridinucha (Sharpe, 1877) – Borneo (except far N).
C. c. cochinchinensis (J. F. Gmelin, 1789) – Java.



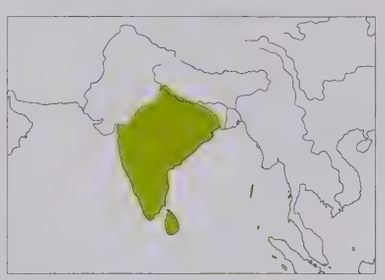
Descriptive notes. 15·8–17·7 cm; male 20–28·5 g, female 19–25 g (*moluccensis*). Male nominate race has black mask from lores to throat, enclosing short, intensely violet-blue jawline flash and partly enclosing eye, shape of bib individually variable; upperparts grass-green, bronzy-tinted over cap and nape; lesser wing-coverts shining blue; outer webs (narrowly edged green) of secondary coverts, tertials and secondaries and whole carpus, alula, primary coverts and primaries bright aquamarine to turquoise; much blue on tail; below, bib surrounded by clear yellow, this broadening into large apricot-yellow patch on breast; remaining underparts bright green, slightly lighter than upperparts; iris brown to red-brown; bill black, or with slaty lower mandible; feet greenish-grey. Female lacks mask, has rather less intense blue on wing and tail, turquoise-green chin and throat merging with blue of jawline flash, and brassy-tinted head, but no true yellow. Juvenile is like female, but has greener throat and no jaw flash. Races vary mainly in details of coloration and pattern of male head and breast, and tone of blue colours: *viridinucha* is like nominate, but yellow of mask border runs around eye, forward over lores, and infills anterior cap, blue areas of wing are richer, cobalt-blue, blue on tail brighter, yellow border of bib of even width (no accentuated breast patch) and backed by bright viridian, remaining underparts viridian-tinted green; *moluccensis* resembles previous, except yellow on cap continues back to nape, where bronzy-washed, yellow bib border narrows onto breast, viridian surround absent, remaining underparts lime-green; *serithai* differs from last in having yellow of cap confined to forehead and sides, pea-green patch on central forecrown, yellow bib border of even width; *auropectus* is like nominate, but has pea-green forecrown patch, and yellow runs around eye, forward above lores and onto forehead; *chlorocephala* resembles previous, except breast patch behind bib less bright yellow and less well demarcated from remaining underparts; *kinneari* is similar to last, but greens slightly darker, bib surround narrower, breast patch duller and even less well demarcated. Voice. Song of various musical, liquid notes, e.g. as "pli-pli-chu-chu", "chi-chi-pli-i" and similar; in NE Indian Subcontinent (race *chlorocephala*) described as "very sweet". In Malay Peninsula, partners communicate with 2-note "kwip-kweep". Elsewhere, a "scrit-chew", first note scratchy, second strongly downslurred, and an upslurred "sfweet" described as sweet and wheezy; also, high-pitched "chi-chi-chi" and "chi'ii", and slightly rattling "pridit".
Habitat. Canopy and edge of evergreen and semi-evergreen forests, including (at least in Sunda region) peatswamp-forest, mature and disturbed; also well-grown secondary forest and nearby mixed orchards, emerging to visit isolated, sometimes low-stature fruit sources in clearings and by tracks and waterways through forest. At plains level and on slopes to 1250 m in Malay Peninsula, to 1400 m in N Vietnam and W Myanmar, to 1500 m in Java, and to 1800 m in India (including in E Himalayan foothills). These upper limits imply some penetration of montane forest, typically in disturbed or secondary vegetation. In India, said to range down to just above plains level, but common at low elevations where humid forest habitat available more widely. The commonest leafbird species of humid edge and secondary growth, which, at least in Sunda region, and independent of altitude, appear to be its core habitat.
Food and Feeding. Generalist; diet arthropods, also fruits, probably also nectar. Arthropods, gleaned from foliage, include orthopterans up to size of large locust and equivalent-sized caterpillars. Fruit part of diet includes figs (*Ficus*) 4–27 mm in diameter, but in Peninsular Malaysia of many fewer species than are visited by *C. sonnerati* and *C. cyanopogon*; also numerous smallish berries (those of *Fagraea*, *Melastoma*, *Callicarpa*, *Eugenia* and introduced *Muntingia calabra* identified in Malaysia). Small fruit items eaten directly; medium-sized, tough-coated items are pierced, and the contents then loosened and squeezed out by using the bill. Visits to flowers of a gesneriad and Myrtaceae in Malaysia assumed to have been for nectar; in N part of SE Asia a frequent visitor to shrubs and trees in flower, including nectar-yielding *Bombax*. Forages alone, paired or in parties, including those of mixed species.
Breeding. Breeds during Apr–Jul in NE Indian Subcontinent; dependent fledglings in May, Jun and Jul in Malay Peninsula, and active nests in Feb, Apr and Jul in Java. Open hammock-type nest of tendrils, dry grasses, "rootlets" and the odd tree leaf, heavily camouflaged with bryophytes and lichens, felted externally with cobweb, suspended from rim 6–10 m up between twigs or fork prongs towards outer end of lateral branch. Clutch 2 eggs, occasionally 3 in N outer tropics; incubation period in captivity 13·5 days; no information on fledging period.
Movements. Probably resident. Claimed irruptions in Assam hills (NE India), with many wintering and a few subsequently nesting, then several years of absence, not regarded as confirmed. No other movements known.
Status and Conservation. Not globally threatened. Relatively common throughout most of range; common in much of SE Asia, including in several protected areas, but scarce in Singapore. Now rather rare in Java.
Bibliography. Ali (1996), Ali & Ripley (1996), Brockelman (1982), David-Beaulieu (1944), Deignan (1945), Duckworth *et al.* (1999), Dunn (1974), Eames & Ericson (1996), Grewal *et al.* (2002), Grimmett *et al.* (1998), Hardy (2003), Holmes (1996), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), McClure (1966, 1967), Medway & Wells (1976), Meyer de Schauensee & Ripley (1940), Rasmussen & Anderton (2005), Riley (1938), Ripley (1982), Robinson (1927), Robson (2000), Smith (1943), Smythies (1986, 1999), Stepanyan (1995), Strange (2002), Stresemann & Heinrich (1939), Stuart Baker (1922–1930, 1932), Wells (2005).

5. Jerdon's Leafbird

Chloropsis jerdoni

French: Verdin de Jerdon **German**: Jerdonblattvogel **Spanish**: Verdín de Jerdon
Other common names: Indian Leafbird, Jerdon's Chloropsis

Taxonomy. *Phyllornis jerdoni* Blyth, 1844, central India.
Probably forms a superspecies with *C. cochinchinensis*, *C. kinabaluensis* and *C. palawanensis*; was for long regarded as a race of first of those, but differs in bill morphology and plumage details. Wing length in N (male 92–93 mm, two females 86 mm and 88 mm) larger than in S (male down to 85 mm in Sri Lanka), but differences considered insufficient to warrant naming of geographical races. Monotypic.
Distribution. India S from S Gujarat (Gulf of Cambay), C Uttar Pradesh, Bihar and West Bengal, and Sri Lanka.



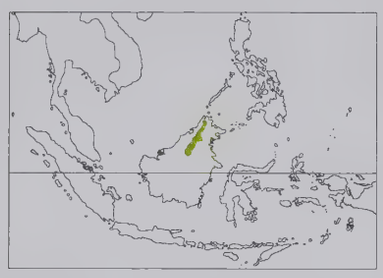
Descriptive notes. 16·7–18·4 cm. Male has black mask from lores back to eye and entire throat, enclosing large, long, intensely violet-blue jawline flash; rim around part of eye free of mask clear yellow, and yellow continues narrowly round margin of bib; cap and broad collar around bib brassy greenish-yellow; plumage otherwise bright grass-green, lighter below, relieved only by glossy turquoise lesser upperwing-coverts and straw-yellow distal outer webs of emarginated primaries; iris brown; bill black, or with grey base of lower mandible; feet slaty grey. Distinguished from *C. cochinchinensis* mainly by lack of blue on flight-feathers and tail, longer jawline flash. Female is like male but lacks mask, has anterior cap olive-yellow and meeting viridian-tinged green at hindcrown level, entire eyelid rim yellow, clean-cut bib turquoise (only slightly duller than jawline flash) and with same yellow border as male; otherwise as male. Juvenile is like female, but cap green (rather than yellowish), bib indistinct, no jawline flash. Voice. Song with random, varied combinations of loud, clear whistles, buzzing notes and rich, sharp notes, said to be similar to that of *C. aurifrons* but slightly deeper, richer and slower; includes much mimicry, especially of drongos (*Dicrurus*), also of Oriental Magpie-robin (*Copsychus saularis*), jungle babblers (*Turdoides*), tailorbirds (*Orthotomus*) and Shikra (*Accipiter badius*). Calls include a jarring rattle, and non-breeders in small parties communicate with a sharp "click".
Habitat. Open forest, secondary growth, orchards, wooded gardens, coconut gardens, and wooded edges of roads, rivers, paddyland, and coffee, pepper vine etc. plantations; including deciduous vegetation. Favours relatively dry conditions, decreasing in numbers with rising general humidity. At plains level and on slopes to not above 1200 m, usually lower. Some habitat and range overlap with *C. aurifrons*, but prefers drier, more open sites.
Food and Feeding. Generalist; diet arthropods and fruit, also nectar. Arthropods include caterpillars, crickets (Tettigoniidae), ants (Hymenoptera) and mantids, gleaned acrobatically in canopy foliage. Fruit part of diet includes figs (*Ficus*) and various berries. Also a regular flower-visitor, evidently seeking nectar; recorded as visiting *Helicteres*, *Loranthus*, *Salmalia*, *Erythrina*, *Cocos* and others. Forages singly or as pair, and joins mixed-species hunting parties. Individuals may defend a nectar source pugnaciously, but at other times apparent non-breeders attend flower crops in parties, and trap-line socially between sources; parties have also been recorded as eating the ripe flower buds of *Anthocephalus cadamba*.
Breeding. Some breeding occurs in all months, but main season in N of range Mar–Sept and in S (including Sri Lanka) Nov–May. Variable-depth open cup-nest, compactly woven, materials include dry grass and soft fibres, with leaf and bark fragments added externally, and felted with cobweb, some silk running through the structure on to its support, with rudimentary lining; suspended at rim from prongs of thin outer fork at canopy level, 5–10 m above ground, typically in shade of overhanging foliage. Clutch 2 eggs, rarely 3 (but perhaps more regularly so in N of range); no information on incubation and fledging periods.
Movements. Resident.
Status and Conservation. Not globally threatened. Uncommon to fairly common; apparently more common on slopes than at plains level. Many populations are held below potential density by effects of trapping for the wildlife trade.
Bibliography. Aitken (1886), Ali (1969, 1996), Ali & Ripley (1996), Bhunya & Mohanty (1987), Dunn (1974), Dutt (1932), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998), Harrison (1999), Henry (1998a), Kazmierczak (2000), Lamsfuss (1998), Legge (1983), Mahabal & Lamba (1987), Majumdar *et al.* (1992), Mason & Lefroy (1912), Phillips (1978), Rasmussen & Anderton (2005), Ripley (1982), Saha & Dasgupta (1992), Stuart Baker (1922–1930, 1932), Wait (1925), Whistler & Kinnear (1933), de Zylva (1984).

6. Bornean Leafbird

Chloropsis kinabaluensis

French: Verdin de Bornéo **German**: Kinabalublattvogel **Spanish**: Verdín de Borneo

Taxonomy. *Chloropsis kinabaluensis* Sharpe, 1887, Mount Kinabalu, Sabah, Borneo.
Specific name sometimes given as *flavocincta*, but original describer subsequently gave precedence to present name. Probably forms a superspecies with *C. cochinchinensis*, *C. jerdoni* and *C. palawanensis*; was for long regarded as a race of first of those, but differs in bill morphology and plumage, exhibits lesser degree of sexual size dimorphism (mean 3% versus 8%), and ranges approach or meet each other without evidence of intergradation. Monotypic.
Distribution. N Borneo, from Mt Kinabalu S along the spinal mountains to Mt Dulit and the Usun Apau Plateau and E to Kayan Mentarang.
Descriptive notes. 17·5–18·4 cm. Male has full black mask from lores and eye to throat, enclosing large blue jawline flash, and with entire yellow border that broadens on breast and also infills anterior cap to forecrown level; rest of cap and upperparts bright lime-green, bronzy-tinged on hindcrown; lesser upperwing-coverts shining blue, outer webs of secondary coverts (narrowly edged green), tertials and secondaries and whole of carpus, alula, primary coverts and primaries bright aquamarine; much blue on tail; underparts below breast green with yellowish tinge; iris dark brown;



bill black; feet greenish-grey. Distinguished from *C. cochinchinensis* (of Bornean race *viridinucha*) mainly by yellower-tinted plumage, much larger and bluer jawline flash, entire yellow border of bib that broadens on breast, blue on wings bright aquamarine (rather than rich cobalt), larger size (male wing 95–100 mm; *viridinucha* 83–87 mm), proportionately heavier, more strongly notched and prominently nail-tipped bill. Female differs from male in having well-demarcated bright viridian (rather than yellow) mask surround, rest of cap emerald-green without bronzy tinting, no jawline flash. Juvenile lacks mask, but other details unknown. Voice. Not described.

Habitat. Canopy and high edge of lower and upper montane forests, mature and well regenerated, from 2200 m down to the montane ecotone; in Sabah, N of the range of lowland *C. cochinchinensis*, disperses below it into evergreen forest of upper submontane slope. At extreme N limit of occurrence, on Mt Kinabalu itself, recorded down to 550 m.

Food and Feeding. Few data. Recorded as taking berries and dragonflies (Odonata). Forages alone, in pairs and occasionally in small parties; joins mixed-species foraging flocks.

Breeding. An instance of nest-building in mid-Nov; an oviduct egg of a "blue-winged leafbird" from the Bario Plateau (Sarawak), dated late Nov, probably refers to this species on basis of altitude. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Fairly common throughout its small range.

Bibliography. van Balen (1997), Davison (1992), MacKinnon & Phillipps (1993), Sheldon *et al.* (2001), Smythies (1999), Strange (2002), Wells, Dickinson & Dekker (2003b), Wells, Hails & Hails (1978), Wilkinson, Dutson & Sheldon (1991), Wong & Phillipps (1996).

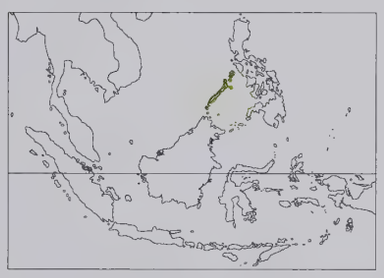
7. Yellow-throated Leafbird

Chloropsis palawanensis

French: Verdin de Palawan **German**: Palawanblattvogel **Spanish**: Verdín de Palawan
Other common names: Palawan Leafbird

Taxonomy. *Phyllornis palawanensis* Sharpe, 1876, Palawan, Philippines.
Probably forms a superspecies with *C. cochinchinensis*, *C. jerdoni* and *C. kinabaluensis*. Monotypic.

Distribution. W Philippines: Calamian Group (Calauit, Busuanga and Culion) and Palawan (including its satellites Dumaran and Balabac).



Descriptive notes. 15·8–17·2 cm. Male has lores and narrow eyelid rim bright turquoise, jawline flash violet-blue; rest of anterior face yellowish, shading to yellowish-green on ear-coverts; cap and upperparts yellow-tinged grass-green, leading edge of lesser wing-coverts, outer median coverts and entire carpus rich blue; alula, primary coverts and (apart from fine edging) outer webs of outer secondaries and primaries aquamarine, brightening to cobalt-blue on primaries P9 and P10; tail dull blue, central feather pair washed green; chin to lower throat chrome-yellow, underparts green, brighter and lighter than dorsum; iris brown; bill black, lateral base of lower mandible bright turquoise; feet grey. Female is as male, but with less blue on lesser wing-coverts. Juvenile undescribed; an adult-type plumage but without violet-blue jaw flash remains to be identified. Voice. A warbled disyllable, "zo-o", in isolation or repeated after short pause; also deliberate "twick err treet", similar to call of *C. flavipennis* but richer and slower, repeated at 5-second intervals.

Habitat. Canopy and edge of lowland evergreen forest; also visits secondary growth.

Food and Feeding. Diet unspecified, but fruit remains and seeds reported in stomach contents. Forages often alone; also joins mixed-species flocks, especially of bulbuls (Pycnonotidae).

Breeding. No information.

Movements. Resident.

Status and Conservation. Not globally threatened. Restricted-range species: present in Palawan EBA. Not well known. Apparently still fairly common where suitable habitat persists. Occurs in St Paul Subterranean River National Park, on main island of Palawan.

Bibliography. Delacour & Mayr (1946), Dickinson *et al.* (1991), Dupond (1942), Inskipp *et al.* (1996), Kennedy *et al.* (2000), duPont (1971), Stattersfield *et al.* (1998).

8. Philippine Leafbird

Chloropsis flavipennis

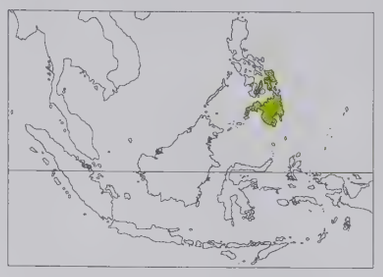
French: Verdin à ailes jaunes **German**: Philippinenblattvogel **Spanish**: Verdín Filipino
Other common names: Yellow-billed/Yellow-quilled Leafbird

Taxonomy. *Phyllornis flavipennis* Tweeddale, 1878, Cebu, Philippines.
Relationships uncertain; its yellow flight-feather edging most closely resembles that of *C. jerdoni*. Birds from NE Mindanao, described as race *mindanensis*, considered inseparable from those in rest of range. Monotypic.

Distribution. C & S Philippines: Samar, Leyte, Cebu and Mindanao.

Descriptive notes. 18·8–19 cm. Has eyelid rim pale cream-yellow, lores the same but with bright green tipping; rest of upperside, to tail, viridian-tinted grass-green, except for brilliant green edging on outer webs of tail, tertials and secondaries, and creamy-yellow carpus edge, outer webs of alula and distal outer webs of emarginated primaries; chin and upper throat pale cream-yellow, merging below into bright yellowish-green, then pea-green; iris dark brown; bill dark horn-coloured, tip paler; feet olive-grey. Sexes alike. Juvenile undescribed. Voice. No song described. Calls include loud, repeated, disyllabic whistle, "chick weeeeep", notes well spaced; also a 3-note "chick-ur-treet".

Habitat. Canopy of lowland evergreen forest, mature and regenerating after disturbance, including habitats described as degraded and secondary; also forest-edge vegetation. Plains level and



slopes, from 100 m to at least 970 m, i.e. within limits of lowland dipterocarp forest; claimed extensions to 1270 m imply a shift into the base of lower montane forest, but that has never been corroborated.

Food and Feeding. No information.

Breeding. Recorded in Jun and Aug, and adults with enlarged gonads in Apr and May. No other information.

Movements. Resident.

Status and Conservation. VULNERABLE. Restricted-range species: present in Cebu EBA (now almost certainly extinct) and Mindanao and the Eastern Visayas EBA. Conventionally classed as rare to very rare everywhere; for Mindanao this rating has recently been revised to "uncommon but secretive", but only one record from W peninsula of the island. Threatened throughout its range by advanced levels of habitat loss; this more or less complete on Cebu, where the species has not been reported since 1920 and is assumed to be extinct; continued existence on Samar and Leyte must also be doubted, with no records from either in more than three decades. It is probably no longer possible to define this species' core habitat, but ecological factors operating to limit real abundance may include the squeezing of populations on to major slopes; for many lowland-forest birds of the region these are reckoned to be of marginal quality, setting the stage for local extinction ahead of final forest clearances.

Bibliography. Anon. (1997b), Collar, Andreev *et al.* (2001), Collar, Crosby & Stattersfield (1994), Collar, Mallari & Tabaranza (1999), Delacour & Mayr (1946), Dickinson *et al.* (1991), Inskipp *et al.* (1996), Kennedy *et al.* (2000), McGregor (1909–1910), duPont (1971), Ripley & Rabor (1968), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

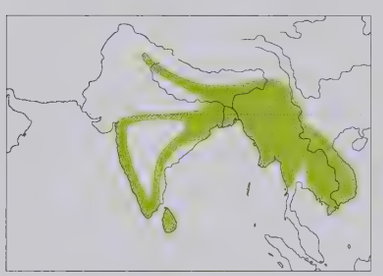
9. Golden-fronted Leafbird

Chloropsis aurifrons

French: Verdin à front d'or **German**: Goldstirn-Blattvogel **Spanish**: Verdín Frentidorado
Other common names: Gold-fronted Chloropsis

Taxonomy. *Phyllornis aurifrons* Temminck, 1829, Cachar, Assam, north-east India.
Forms a superspecies with *C. media* and was for long considered conspecific, but differs in several respects, including in development of mask. Six subspecies recognized.

Subspecies and Distribution.
C. a. aurifrons (Temminck, 1829) – NE Indian Subcontinent (E in Himalayan foothills from Himachal Pradesh, S to Orissa) and N, W & C Myanmar.
C. a. frontalis (Pelzeln, 1856) – W & E India (S from S Gujarat and the Satpura Range and, in E, from C Orissa).
C. a. insularis Whistler & Kinnear, 1932 – far SW India and Sri Lanka.
C. a. pridii Deignan, 1946 – S China (SW Yunnan), E & S Myanmar, NW & W Thailand and N & C Laos.
C. a. inornata Kloss, 1918 – EC & E Thailand, S Laos and C Vietnam.
C. a. incompta Deignan, 1948 – SW & SE Thailand, Cambodia and S Vietnam.



Descriptive notes. 17–19 cm. Male nominate race has orange forehead and forecrown; black mask extending from lores and eye to lower throat, within which entire chin, upper throat and malar region violet-blue; broad and prominent yellow band around lower part of bib; turquoise-blue lesser upperwing-coverts; all other plumage bright grass-green; iris dark brown; bill black; feet greenish-slate. Female differs from male only in having rather less blue on lesser wing-coverts, and in slightly smaller size; orange of forecrown tends to be somewhat duller. Juvenile is all green, except for yellow eyelid rim. Races vary mostly in extent of violet-blue within mask and of yellow bordering bib: *pridii* differs from nominate in having narrower yellow band around bib; *inornata* resembles previous, but has less orange on cap (extends back only to about mid-eye level), only a hint of yellow around bib; *incompta* is like nominate, but no yellow around bib; *frontalis* has long, intensely violet jawline flash but fully black chin and throat, orange on forehead only to mid-eye level, no yellow band around bib; *insularis* is separated from last mainly by size, male wing 91–93 mm (as opposed to 100 mm). Voice. Song, mostly from outer end of high branch at or just below canopy summit, a high-pitched, faltering but sweet, whistling twitter with warbled, scratchy and many repeated notes, e.g. "twitter, chirp, twit, twitter, twitter, tip, weety weety" or "vi-tu, tieu, tieu, tieu, tieu, vi-tchit", or "tswee-tswee-cheep-cheep", with much added mimicry (some songs virtually all mimicry), regularly of drongo (*Dicrurus*) sounds ("swích-chich-chich-wéé"); other models reported include bulbuls (Pycnonotidae), tailorbirds (*Orthotomus*), Oriental Magpie-robin (*Copsychus saularis*), ioras (*Aegithina*), shrikes (Laniidae), White-throated Kingfisher (*Halcyon smyrnensis*) and Crested Serpent-eagle (*Spilornis cheela*), also migrants, vocalizations of which continue to be used after their departure. Shorter contact calls, upward-inflected or downward-inflected, include "chup-chaw", "chi-wit, chi-wit", a sweet "zi-zi", "kaa-chip" like that of Streaked Spiderhunter (*Arachnothera magna*), harsh metallic "tzit" and "brnt-tzit", and voluble, whistling rattle; parties tend to be noisy while feeding.

Habitat. Canopy of deciduous forest to relatively open semi-evergreen to fully evergreen broadleaf forests, forest edge, secondary growth (including bamboo forest), tree plantations, wooded stands in coffee and tea estates, and wooded gardens. Plains level to c. 1200 m in N & E of range and exceptionally to 1800 m in S (Sri Lanka), but typically lower. In India, avoids the dry conditions favoured or tolerated by sympatric *C. jerdoni*.

Food and Feeding. Generalist; diet arthropods, fruits and nectar. Loners, pairs or small parties forage for arthropods in canopy foliage, often acrobatically on thin outer twigs; pursues flushed items, also takes winged termites (Isoptera), etc.; some flower-visiting is also for purpose of seeking insects. Fruits include figs (*Ficus*) and berries; small fruit items eaten directly, but medium-sized, tough-coated items are pierced, and the contents then loosened and squeezed out by using the bill. Nectar seems to be important in diet, and sources are at times defended individually; at other times parties of 4–12 or more trap-line between flowering crowns, epiphytic clumps etc., the commoner named sources being *Bombax*, *Erythrina*, *Butea*, *Salmalia*, *Woodfordia*, *Firmiana* and, especially, species of *Loranthus* mistletoe. Nectar reached for in tubular corollas,

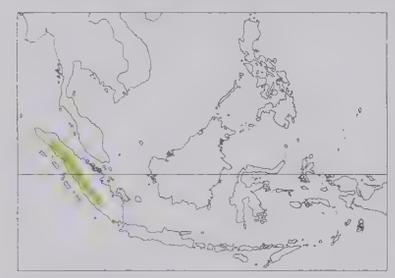
often by hanging with head downwards, occasionally while hovering. Nectar of bananas (ordinarily reachable only with a long-protruding tongue) also taken, by puncturing base of tubular corolla.
Breeding. Through Indian Subcontinent overall some breeding occurs in all months, but with regional variation, thus in Feb–Aug (peak Jun/Jul) in S India and Sri Lanka; seasonality in SE Asia little known, probably Feb–Jul. Nest built by both pair-members, one site-guarding while the other forages for materials, an open cup of fine twigs, bryophytes, tendrils, grass, bark fibre, bamboo leaves and always some cobweb, sparsely lined with grass, secured hammock-like 9–12 m up between thin prongs of outer fork. Clutch 2 eggs, less usually 3 (but 3 eggs said to be the norm in Thailand); in captivity, incubation period 14 days and fledging period 15 days.
Movements. Mainly resident; slope-living populations in Himalayan foothills said to perform short-range vertical migrations.
Status and Conservation. Not globally threatened. Common to fairly common throughout most of range. Trade in this species, however, is heavy, and many of its populations are depressed by trapping for the cagebird market. Occurs in several national parks across its range, e.g. Royal Chitwan (Nepal), Corbett and Mudumalai (India), Doi Inthanon (Thailand) and Nam Bai Cat Tien (Vietnam).
Bibliography. Ali (1969, 1996), Ali & Ripley (1996), Deignan (1945), Duckworth & Tizard (2003), Duckworth *et al.* (1999), Dunn (1974), Eames & Ericson (1996), Eve (1991), Eve & Guigue (1996), Fleming *et al.* (1984), Gibson (1986), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Henry (1998a), Inskipp, Inskipp & Grimmett (1999), Inskipp, Lindsey & Duckworth (1996), Kazmierczak (2000), Lamsfuss (1998), Law (1936a), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Mackintosh (1915), Mahabal & Lamba (1987), Majumdar *et al.* (1992), Mason & Lefroy (1912), McClure (1998), Phillips (1978), Rasmussen & Anderton (2005), Riley (1938), Ripley (1982), Robson (2000), Saha & Dasgupta (1992), Smythies (1986), Stepanyan (1995), Strange (2002), Stuart Baker (1922–1930, 1932), Unfricht (1998), Wait (1925).

10. Sumatran Leafbird

Chloropsis media

French: Verdin de Sumatra **German**: Sumatra-Goldstirnblattvogel **Spanish**: Verdín de Sumatra

Taxonomy. *Phyllornis media* Bonaparte, 1850, Sumatra.
Forms a superspecies with *C. aurifrons* and was for long considered conspecific, but differs sufficiently, including in development of mask, to warrant species rank. Monotypic.
Distribution. Upland Sumatra, from Aceh S through Barisan Range to Selatan.



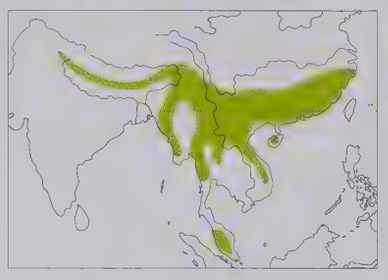
Descriptive notes. 17·7–18·8 cm; one female 40 g. Male has anterior cap back to mid-eye level clear yellow; mask from lores and eye to lower throat black, enclosing long, unusually narrow, intensely violet jawline flash; lesser wing-coverts out to carpal joint shining electric blue; plumage otherwise grass-green, lighter and brighter below; iris dark brown; bill black; feet dark grey to blackish. Female lacks black mask, has entire eyelid rim yellow, jawline flash turquoise, rather than violet, and blue on wing less prominent. Juvenile is all green, apart from yellow eyelid rim. Voice. Song of paired male in captivity loud and richly melodic; voice not otherwise described.
Habitat. Middle stratum and canopy of lowland evergreen forest, mature and regenerating, and secondary forest, plantations and village orchards; also visits trees standing out from edge of forest. Submontane slope at 600–1000 m; has not been demonstrated to enter montane forest, and core habitat still in doubt.
Food and Feeding. Little known. Probably generalist. Attracted to canopy-level crops of ripe figs (*Ficus*), but nothing known of other aspects of diet.
Breeding. In the wild, fledglings attended by adults in Jul. In captivity, one clutch of 2 eggs, incubation period 13–14 days. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Only recently split as separate species, and conservation status requires reassessment; in view of the fact that it is often treated as a race of the more widespread and generally common *C. aurifrons*, its conservation status has been largely ignored. Poorly known species. Common in W Sumatra in early 20th century; present-day status uncertain. Recorded in the recent European cagebird trade.
Bibliography. Chasen & Hoogerwerf (1941), Holmes (1996), Kloss (1931), Kraus (1986), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Meyer de Schauensee & Ripley (1940), Robinson & Kloss (1918, 1924).

11. Orange-bellied Leafbird

Chloropsis hardwickii

French: Verdin de Hardwicke **German**: Orangebauch-Blattvogel **Spanish**: Verdín de Hardwicke
Other common names: Hardwicke's Leafbird, Orange-bellied Chloropsis

Taxonomy. *Chloropsis Hardwickii* Jardine and Selby, 1830, Nepal.
Nominate race and *malayana* intergrade in S Myanmar (N Tenasserim) and possibly more widely; these two are well differentiated from E races, but the two groups intergrade in N Laos, possibly also in SW China. Population in SC Vietnam (including Da Lat Plateau), currently included in *melliana*, may represent a separate, as yet undescribed race; further study required. Four subspecies recognized.
Subspecies and Distribution.
C. h. hardwickii Jardine & Selby, 1830 – N India (Himachal Pradesh) E in Himalayan foothills and hill tracts to S China (SE Tibet, Yunnan), Myanmar, NW Thailand and N Laos.
C. h. malayana Robinson & Kloss, 1923 – uplands of S Myanmar (N & C Tenasserim) and Peninsular Malaysia.
C. h. melliana Stresemann, 1923 – uplands of S China (from Guizhou and Guangxi E to Fujian) and of N & C Vietnam (S to S Annam).
C. h. lazulina (Swinhoe, 1870) – uplands of Hainan I.



Descriptive notes. 17–19·8 cm. Male nominate race has full black mask from lores and eye, extending to form broad bib down to upper breast, enclosing large jawline flash of shining violet-blue; anterior cap and narrow border around rest of mask subdued bronzy yellow; lesser wing-coverts out to carpal joint brilliant electric blue, other coverts, flight-feathers and tail deep black with dark purplish-blue edges; remaining upperparts grass-green; underparts below bib tawny-orange (may appear rich yellow in the field), upper flanks sharply demarcated green; iris dark brown; bill black; feet pale grey. Female has full yellow eyelid rim, duller jaw flash than male, smaller area of electric blue on wing, orange belly and vent, rest of plumage grass-green. Juvenile is entirely grass-green, apart from yellow eyelid rim. Race *malayana* differs from nominate only in small size, male wing 86–91 mm (nominate male 95–97 mm); *melliana* has cap blue-grey, rather than bronzy, and breast deep indigo, rather than black, female has underparts entirely green; *lazulina* differs from previous in having longer bill. Voice. Song, typically from open, treetop perch, the fullest and longest-sustained of family. In W races (both sexes), highly varied and melodious, with many ringing and doubled notes and phrases, e.g. "tshiwatshishi-watshishi-watshishi", "chitik joikjoikjoikjoikjoikjoik", "jijiju jirriju driju-driju", "cheat chewee-chewee-cheweei", "brechu préép brechu-brechu-choo-píá", "pitu-pitya-pitya-pitu", repeated "tyawit-tyatyawi-tya", or "easy easy jiep-jiep-jiep, chiwít-ta chiwít-ta chiwít-ta, weekweek-weekweekweek", or "kipper-kipper-kipper che ayeya-bing", "peer chee poot pee chip", etc.; much mimicry, including of, among others, bulbuls (Pycnonotidae), drongos (*Dicrurus*), green magpies (*Cissa*), minlas (*Minla*), sibias (*Heterophasia*), tits (Paridae), sunbirds (Nectariniidae) and spiderhunters (*Arachnothera*), tree-swifts (*Hemiprocne*) and Crested Serpent-eagle (*Spilornis cheela*). Calls include loud, rapid "ti-ti-tsyi-tsyi-tsyi-tsyi-tsyi-tsyi" followed by hoarse scold; slurred "fwéééw-whew", like that of an oriole (*Oriolus*); and, between foragers, a soft "choat", mewing "chair" and wheezing "frease". A realistic Streaked Spiderhunter (*Arachnothera magna*) flight-call simulation, "chittik", common at take-off.
Habitat. Canopy and edge of deciduous to evergreen forests, and secondary growth. Breeds between c. 600 m and 2000 m in Himalayas, above zone occupied by *C. aurifrons*; down to 500 m in W Myanmar but not necessarily breeding at that altitude, and generally not below c. 1000 m (wholly within montane forest) at lower latitudes.
Food and Feeding. Generalist; diet arthropods, fruits and nectar. Forages alone or in pairs, and sometimes joins mixed-species flocks. Gleans outer foliage and flowers for caterpillars, spiders (Araneae) and other arthropods, and chases winged termites (Isoptera), moths and butterflies (Lepidoptera) and other insects. Fruits, including figs (*Ficus*) and berries, eaten directly if small; medium-sized, tough-coated ones are pierced, and the bill then used to loosen and squeeze out contents. In N of range, one or more individuals, sometimes large parties, seek out flowering clumps and crowns of e.g. *Bassia* and larger-flowered mistletoes (*Loranthus*), often behaving acrobatically as they reach and probe into deep tubular corollas for nectar; individuals may patrol and defend a foraging patch. No flower-visiting reported in S of range, but assumed to occur there. Transferable pollen sticks to the face of flower-visitors, and this may explain silvery appearance of forehead often acquired by birds in Malaysia, even though no such foraging behaviour has been observed there.
Breeding. Nests have been found only in N of range, where Sino-Himalayan breeding season May–Aug. Shallow, open cup-nest of fine fibrous materials, sparsely lined and rarely with any external decoration, supported hammock-like at rim between thin twigs (not necessarily prongs of a fork) towards outer end of upper branch, typically 6–10 m up but a few records as low as 3 m. Clutches of 2 and 3 eggs recorded; no other information on wild-living populations; in captivity, incubation period 13 days, fledging period 12 days.
Movements. Altitudinal migrant in Himalayas, probably also in China and possibly in extreme N part of SE Asia; descends to plains level during winter in NE Indian Subcontinent.
Status and Conservation. Not globally threatened. Common in substantial parts of its range. An influx into Hong Kong since mid-1980s has been interpreted as natural expansion out of adjacent S China. Widely trapped for the cagebird trade, but this activity appears not to have had any serious overall effect on this species' numbers.
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Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family IRENIDAE (FAIRY-BLUEBIRDS)



- Robust, medium-sized arboreal frugivores with short tarsi, and strong notched and nailed bill; spectacular structural plumage colour, verditer to brilliant glistening blues, set off by black or indigo, and a blood-red iris.
- 21–27·5 cm.



- Oriental Region.
- Evergreen to semi-evergreen forest in lowlands and lower montane zone, ranging to forest edge and, locally, to certain plantation crops nearby.
- 1 genus, 2 species, 10 taxa.
- No species threatened; none extinct since 1600.

Systematics

Not since the 1920s have the fairy-bluebirds been treated as more than just a pair of species in a single genus, *Irena*. They are exclusive to the tropics of the Oriental Region and are assumed to be endemic there, although fossils are lacking.

Irenids entered the systematic record ahead of their allies, the leafbirds (Chloropseidae), and from a very different quarter, as the describer of the blue-backed bird from India believed it to be a roller (Coraciidae) and placed it in the genus *Coracias*. There the Asian Fairy-bluebird (*Irena puella*) remained until the 1820s, when its supposed affiliation was challenged by T. Horsfield and C. J. Temminck, who found nothing roller-like in the structure of fairy-bluebird specimens available to them from Java. Instead, they agreed on a likely relationship with the drongos (Dicruridae), an opinion that was seized upon widely and which held off a countering view for most of the rest of the century. This second view invoked the short foot of *Irena*, resembling that of a bulbul (Pycnonotidae), together with the possession of hair-like filoplumes among normal feathers of the nape, a character then considered diagnostic of bulbuls. These filoplumes were first noted in 1847 by the German taxonomist J. Cabanis, who switched his view accordingly. In that, he was soon followed by E. Blyth of the Calcutta museum in India, and Blyth appears to have been the first also to propose a further, special link with the leafbirds and the ioras (Aegithinidae). Support for this alternative view lived on in India but waned elsewhere, until resurrected in 1878, independently, by the Marquis of Tweeddale and by A. O. Hume. Papers by these authors may have influenced a key decision made by R. B. Sharpe to revise his entry in the *Catalogue of the Birds in the British Museum*, in which he separated irenids from the drongos in favour of a relationship with bulbuls, leafbirds and ioras, all of which at that time he actually believed to be babblers (Timaliidae). The drongo hypothesis effectively died at that point, but unnoticed in this change-about had been Hume's decision to place *Irena* at the end of his treatment of bulbuls, leafbirds and relatives, and to follow it directly with the orioles (Oriolidae). This action was to add another long, diverting strand to the group's history.

The notion of an exclusive, full-ranking family Irenidae is due to H. C. Oberholser, arch-splitter of his day, who, in 1917, rejected the bulbul-like features of fairy-bluebirds as being superficial, but offered no alternative ideas. In response, others picked up the oriole link. Hume's sequence choice may simply have been of a group of passerines of about the "right" shape and size, whereas a major regional publication by E. C. Stuart Baker, in 1926, gave the idea a fillip by claiming a likeness discovered between the juveniles of orioles and fairy-bluebirds. This was soon queried, although never explained (see Morphological Aspects). Nevertheless, it seems to have been enough to promote camps of support for an oriole relationship, remote from bulbuls and their supposed relatives, on the one hand, and, on the other, Sharpe's *Catalogue* arrangement, some versions of which extended to treating fairy-bluebirds, along with the leafbirds and ioras, as genera within a family Pycnonotidae. J. Delacour, in his 1960 treatment for J. L. Peters's *Check-list of Birds of the World*, joined the "bulbul camp", with a family Irenidae that included also the leafbirds and ioras placed next to Pycnonotidae. A. Wetmore countered this almost at once, citing sufficient structural divergence of the external nares, internarial septum, lachrymal part of the orbit, and secondary palate, for sundering *Irena* from all of these groups. He then proceeded to classify fairy-bluebirds as a subfamily of the Oriolidae, on the basis of a "general resemblance" of sternum and pelvic-girdle shapes, similarly glossy tips of the body feathers (no structure specified), and "lack of any important differences" between the two groups.

Since then, the impression has been of a dubious conclusion that the anatomist himself might never have been tempted to reach had oriolids not been on the historical taxonomic agenda. For convenience of reference, at least, something close to Wetmore's view still informs about as many modern handbooks and guides as does the bulbul hypothesis, but neither has fared well in the era of molecular taxonomy. C. G. Sibley and J. E. Ahlquist's DNA–DNA hybridization findings reconnected fairy-bluebirds and leafbirds, nesting both deeply and presumably, therefore, anciently within these authors' oscine parvorder "Corvida", with no claimed proximity to orioles, and well removed from the more recently diverged ioras. Subsequently, studies using nuclear-gene base-sequencing, carried out by F. K. Barker and colleagues in 2001, and reviewed by J. Cracraft and co-workers in 2003, suggest that the fairy-bluebirds and the leafbirds are indeed linked, but that both are remote from "corvidans" and should be transferred into Sibley and Ahlquist's other parvorder, "Passerida". Here, the data root them near the sunbirds (Nectariniidae), within a large family Passeridae, thus also well clear of the lineage containing the bulbuls. Leafbirds are now considered to be the fairy-bluebirds' closest allies, but

apparent time from divergence leaves a choice to be made between treating the two groups together or, as is often preferred, in two separate families.

Morphological Aspects

Fairy-bluebirds are indeed roughly the same in shape and build as a medium-sized Old World oriole, and they look more like orioles than like any generally smaller, more slender bulbul or leafbird. They are robustly built, in the approximate weight range 50–100 g. This rather large span, applicable to both species, is accounted for partly by sexual dimorphism, in which males average slightly larger than females, but more by geographical variation. The largest and the smallest subspecies of the Philippine Fairy-bluebird (*Irena cyanogastra*), namely the nominate race and *melanochlamys*, are a fair match for their Asian Fairy-bluebird equivalents, respectively the nominate subspecies and *crinigera*, and latitudinal trends in both species accord with Bergmann's Rule, *melanochlamys* and *crinigera* being the forms living closest to the equator. This parallel size variation is well demonstrated by the differences in wing lengths of males: in the Asian Fairy-bluebird, 13·1–14·0 cm in the nominate race of northeast India, as against 11·6–12·4 cm in southernmost *crinigera*; compared with the Philippine Fairy-bluebird, in which the northern, nominate race measures 12·9–13·8 cm, as opposed to southern *melanochlamys* at 11·6–12·2 cm.

The bill is powerful, proportionately more so in the Philippine species, and rather deep. It is also laterally compressed, although not extremely so, and among Asian Fairy-bluebird populations it is diagnostically least compressed in the small-island subspecies *andamanica*. Prominently notched and nailed, the bill is suited for gripping and squashing, well beyond the limit of leafbird variation and with none of the modifications that go with that family's protrusible, pumping tongue. The feet are rather small, unlike those of the orioles, and the tarsi are short even by bulbul standards. These characteristics suggest that irenids place less emphasis on foraging by climbing and reaching for food among foliage and that, by analogy with very short-footed forest birds of about the same body mass, such as some trogons (Trogonidae), they devote more effort to the fly-to/fly-past snatch, a technique that the Asian Fairy-bluebird is known to employ on long-stemmed fruit (see Food and Feeding).

Irenids are best known for their exceptional structural colours, extraordinary cobalt-blue, turquoise-blue and violet-tinted blue generated by specialized naked feather-tip barbs, with an enamelled brilliance particularly on the upperparts of male Asian Fairy-bluebirds. These colours cover most of the cap, the upper neck and all of the upper body, including the lesser and median wing-coverts, of adult male Asian Fairy-bluebirds, the cap, wing-covert tips and rump of Philippine Fairy-bluebirds, and the uppertail-coverts and undertail-coverts of both species. They are set off sharply by surrounding areas of deepest indigo to velvety black, and a bright red iris. The blues are a link with the leafbirds, but even in the less "flashy" Philippine Fairy-bluebird they are much more prominent, being permanently exposed, whereas they are mainly concealed in the relaxed, sleeked-down postures adopted by most leafbirds. In sunlight, with high UV radiation and against a dark, matt surround, the striking colours of the two irenids surely have special social signalling functions, even at a distance.

The main accepted difference between the Asian and Philippine Fairy-bluebirds is that the former is strongly sexually dichromatic and the other hardly so at all. Further, whereas isolation of leafbirds on oceanic parts of the Philippine archipelago produced henny males, as demonstrated by the Philippine Leafbird (*Chloropsis flavipennis*), isolation of fairy-bluebirds on several of the same islands did the opposite, either producing or sustaining cock-plumaged hens. The really interesting evolutionary question posed by the difference is which of the two plumage types, the bright blues and black or the near-uniform, matt verditer-green of the female Asian Fairy-bluebird, is primitive for *Irena* and which is derived. In deep forest shade, the proven nesting habitat of the Asian species, even strongly enamelled structural blues cease to be the give-away that they are in sunlight. Instead, it is black and deep indigos that show up, which is why, in a fleeting understorey glimpse, fairy-bluebirds of both species are often mistaken for an all-black, square-tailed drongo. Without this contrast, plain verditer female Asian Fairy-bluebirds are relatively cryptic when under shade. Now that aviculturalists have uncovered the extent of their role in nesting (see Breeding), it is hard to accept that a proto-*cyanogastra* stock lost a useful trait as a sec-



*Structurally, the **Asian Fairy-bluebird** combines features of Old World orioles (Oriolidae), bulbuls (Pycnonotidae) and leafbirds (Chloropseidae), all of which have been, at some time or other in its taxonomic history, considered close allies. In coloration, however, the male differs stunningly from these other families, his mixture of velvety black and luxurious blues offset by a crimson eye. The blue feathering is glossy and enamelled, an effect created by specialized naked barbs at the tips of feathers. Interestingly, the tail coverts are unusually lengthened in the races from the Sundaic region, though normal in the others; the reason for this is unknown.*

[*Irena puella malayensis*, Pulai, Peninsular Malaysia. Photo: Morten Strange]



*The female **Asian Fairy-bluebird** is a dowdy version of the male, with both black and blue portions replaced with dull verditer-green feathering. In this photograph, the blue tone has been picked out by flash, but it is much more subdued in the dim light beneath the forest canopy, often appearing merely blackish. Not only does the absence of gaudy plumage in females suggest that the bright colour of males is a sexual signal, but it also implies a need for camouflage that is greater in one sex than the other. This makes sense given that incubation is undertaken solely by females, on shallow flimsy nests: any bright colouring would render them conspicuous to predators. Like males, females have relatively short and stout legs, and they might be more easily mistaken for drongos (Dicruridae), were it not for their relatively short and simple tails.*

[*Irena puella.*
Photo: Konrad Wothe]

ondary development, unless, of course, some special advantage could have been gained from mimicking males. In effect, isolated island life may have helped *cyanogastra* to retain something of the primitive female fairy-bluebird condition, replaced completely in continental *puella* stock by a derived plumage that *cyanogastra* ancestors quite probably never had.

There is more to this deconstructive approach, following on from juvenile male Asian Fairy-bluebirds moulting into an only marginally bluer version of female-type plumage, as mentioned at the end of this section. It is notable that, although males of this species showing mixed immature and adult plumage are common in museum collections, only some of these specimens give evidence of having been in active moult when they were collected. Aviculturalists claim that captive male Asian Fairy-bluebirds held in the temperate zone start to moult into adult plumage at one year of age. In the wild, however, it appears that full acquisition of bright colours may often take more than one bout of moulting, thus perhaps even longer, hinting at delayed entry into the breeding population, if not delayed sexual maturity, a situation often associated with a non-monogamous mating system. Might some such system bear on the function of the gatherings of this species at a canopy fruit source, rendered conspicuous by persistent vocalizing; also, of single-sex parties of itinerants that show some social cohesion, as opposed to the possibly permanently paired behaviour of the Philippine Fairy-bluebird, gatherings of which are said not to exhibit cohesion? Where the harvesting of a large crop spreads over a few weeks, within which it may be possible to fit a breeding attempt, could Asian Fairy-bluebird males be operating a "mobile lek"? These are topics for basic research, but other, linked, questions follow (see General Habits and Breeding).

Finally, what can be made of the exaggerated development of the tail-coverts found in Sunda region subspecies of the Asian Fairy-bluebird? Both sets of coverts of both irenid species are everywhere highlighted by structural blues, implying that these parts are employed in some form of signalling behaviour. How the Philippine species behaves has not been recorded, but male Asian Fairy-bluebirds at a gathering persistently pump the tail up and down in a way that would ensure that the bright blue coverts are exposed from both directions. The function of the signal is unknown, but this action strongly resembles the tail-pumping of frugivorous pigeons (Columbidae) when aggressively defending a temporary feeding patch in the fruiting crown of a tree. They, too, show contrasting tail-covert colours, and some species gather at the same feeding sites as those frequented by fairy-bluebirds, implying a signal function that may even work across taxa.

What is unexplained is why the Asian Fairy-bluebird populations of Java, Sumatra and Borneo, subspecies *turcosa* and *crinigera*, have developed coverts long enough to encase the tail, above and below, to slightly beyond its tip, a feature rare among oscine passerines. Apart from the subspecies *malayensis* in the Malay Peninsula, which intergrades with the nominate race north to about the historical limit of Malayan-type rainforest, all other populations of this species, and all taxa of the Philippine Fairy-bluebird, have tail-coverts of normal length. This includes the Asian Fairy-bluebird subspecies *tweeddalei* of the Palawan group of islands, to the north-east of Borneo, perhaps as the survivor of a take-over by a new equatorial type of irenid. Why the Asian Fairy-bluebird should have evolved an apparent super signal within just one part of its range, without this having spread farther, and what additional functions this feature may have acquired, are still mysteries.

That leaves issues of plumage sequence, supposedly streaked juveniles, and a strange assertion that males of the Asian Fairy-bluebird acquire adult colours without moulting. Adult and post-juvenile irenid plumages are believed all to be more or less well known, whereas young juveniles receive hardly a mention in the literature from the field, and are conspicuously lacking in museum collections. Most information about the earliest stages of development, restricted exclusively to the Asian Fairy-bluebird, is derived from the monitoring of chicks hatched and reared in aviaries. A reconciling of several independent descriptions, by four authors, shows the nestlings to be thickly downy, the down initially greyish but darkening to dark brown or dark grey-brown as it develops, with the mouth-lining red or dark red, a black central spot inside each mandible, and the bill tip white. The first teleoptile feathers, those following the natal down, erupt on the head and upperparts on day five; they are verditer-green like the adult female feathering, but browner on the wings. The chick fledges with the underparts still downy but, specifically on the chest, now sooty black in colour, and the moult out of down to a fully verditer-green body plumage intensifies about one week later. The tail feathers are said to be narrower than those of adults, and the outer primary broader. At day 44, the young have been described by H. Knöckel, the one source on timing of the post-juvenile switch into a complete, all female-like immature or first-year plumage, as being about to enter a full moult.

The nestling of the Philippine Fairy-bluebird remains undescribed, and this species' juvenile stage is known only from a single fledgling collected with a pair of adults on the island of Leyte. Still growing the wings and tail, this individual appears to have moulted out of nestling down and is already adult-like, except for the fact that its tail-coverts show little blue, perhaps because they have not fully emerged. Whether either sex of this species then proceeds to a further pre-adult moult is unknown, but the quite probable answer is that neither does so.

No avicultural source mentions dark streaking at any stage of juvenile development, and Stuart Baker's claim that the young Asian Fairy-bluebird exhibits streaking resembling that of a juvenile oriole was clearly a misconception. This assertion has not been explained, but it may well have been founded on a plumage aberration fairly common in both sexes of all subspecies of this irenid, noticed a few times in the Philippine Fairy-bluebird, and widespread also in other groups of birds showing extensive structural blues and blue-greens, such as the pittas (Pittidae) and certain muscicapid flycatcher genera. The vane and shaft of the regular fairy-bluebird upperpart feather are uniformly blue or green. In some individuals, however, the shaft and the bases of the adjacent barbs lack or have reduced reflective material, so that these appear black or grey. The area in-

volved varies from just the shaft to, commonly, a long wedge of barb bases that expands on to the tip of the feather or, more rarely, to a large dot that fills most of both webs. In can occur anywhere, apparently randomly, but usually affects only a part of any one individual. The effect can sometimes be of streaks, but how Stuart Baker could have supposed this to be so only in juveniles is not obvious. It is difficult to understand how he missed it in fully adult males.

A notion that the male Asian Fairy-bluebird acquires blues by modification of the fully developed feather, without a moult, is attributed to E. W. Oates, a compiler of the bird volumes of the first edition of *Fauna of British India*. It was repeated by H. C. Robinson, in 1927, but has no known basis in fact. The explanation may have to do with immature males being just separable from females by the slightly broader apical fringe of blue that they show on the contour feathers. In adult males, verditer retreats to the deep, hidden base of the contour feathers, but its extent varies among individuals; in a minority, typically with some immature feathering retained, it does in fact just emerge to become visible behind the blue tip. A continuity of structural change from the immature condition may have been one interpretation of this variation, but the distinction between feather generations in the moulting post-immature male is perfectly clear, and it is hard to imagine how the idea really came about.

Habitat

Most field accounts of the Philippine Fairy-bluebird specify "original forest" as the species' habitat, and tall, more or less closed-canopy evergreen to not less than semi-evergreen, broadleaf lowland forest is the core habitat of both irenid species. In his exploration of Tenasserim province, in peninsular Myanmar, W. R. Davison remarked on the promptness with which the Asian Fairy-bluebird dropped out of the fauna as evergreen forest gave way to deciduous forest, only to reappear farther on as the latter reverted back to evergreen; this observation nicely illustrates this bird's critical dependence on habitat that is able to support fruit production throughout the year.

Hardly anything is known about the dispersal tendencies and capacities of the Philippine Fairy-bluebird, although J. Whitehead found that it visited forest of low stature, by which, it is guessed, he meant degraded forest. It is well known that parties of Asian Fairy-bluebirds are able to cross gaps between blocks of favoured forest, and also visit habitats such as peatswamp-forest, heath-forest and montane forest in which they do not breed or appear to remain for long, but which offer periodic fruit supplies. It would be reasonable to surmise that the irenid populations of nearby core habitat are aware of these food sources and that they monitor them. Certain kinds of berry-producing plantations, such as coffee with flowering shade, fall into the same category. For these relatively powerful, over-canopy fliers, the altitude extremes reached when searching, 1800–1900 m in the case of the Asian Fairy-bluebird and 1500 m for its Philippine congener, are potentially within daily travelling distance of the ecotone with core habitats. Incidental observations, however, suggest that it is more likely that profitable food sources are attended until they decline.

Most foraging by fairy-bluebirds is conducted at canopy level, dictated mainly by the whereabouts of the biggest crown-borne crops of bird-attracting figs (*Ficus*). Some forays extend to smaller, interior crowns of the middle stratum. The Asian Fairy-bluebird, at least, is also one of many canopy-living birds that descend deep into the shade layers of the forest in order to nest (see Breeding). Predation may be less in denser parts of the understorey and lower middle stratum, far from an interface. More certain advantages are the mechanical shelter and the stable, equable micro-climate that these offer by comparison with canopy conditions. Such factors may be especially beneficial when eggs are incubated, and perhaps nestlings brooded, by only one member of the pair (see Breeding).

General Habits

Fairy-bluebirds occur in pairs or in parties. Although single individuals occasionally join mixed-species foraging flocks, loners, at least of the Asian Fairy-bluebird, are an exception. On the island of Dinagat, in the southern Philippines, subspecies



For most of the year ***Asian Fairy-bluebirds*** *are essentially frugivorous. Within this definition, they are generalists, consuming fruit of a variety of types and sizes from a broad range of plants. It is thought that their mainstay, at least in the forests of South-east Asia, is the mass-fruiting of fig* (Ficus) *trees, a veritable bonanza which this individual is harvesting. Their requirement for a year-round supply of fruit restricts them to primary and tall secondary evergreen forest, although they will venture into nearby cultivated orchards when fruit is in season. They cannot survive in deciduous or semi-deciduous woodland, where fruiting patterns tend to be seasonal.*

[*Irena puella malayensis*, Singapore. Photo: Morten Strange]

hoogstraali of the Philippine Fairy-bluebird was observed to occur mainly in pairs. Even though numbers gathered at a fruit source, the party, when disturbed, dispersed in pairs that made off in different directions, implying no true flocking behaviour.

As discussed later (see Breeding), nothing is known of the breeding behaviour of the Philippine Fairy-bluebird, and little information is available on the breeding habits in the wild of Asian Fairy-bluebirds. The latter do appear to show quite strongly cohesive flock behaviour, and the general assumption had been that breeders dispersed to nest, after which they regrouped. What casual connection with groups they might maintain during nesting, and what level of pair relationship might persist after a return to social living, if that is what actually happens, both remained unknown. Overlooked in this scenario was the discovery by aviculturalists that the whole pre-hatch phase of the Asian Fairy-bluebird's nesting cycle is the province of the female alone. In addition, F. H. Sheldon and colleagues made the unexpected observation in northern Borneo that journeying flocks of the subspecies *crinigera* are often of a single sex. This backed yet another overlooked report, from Peninsular Malaysia, of parties exclusively of "females" of subspecies *malayensis* seen in the hill forest of Penang Island. The Bornean observation made no mention of which sex predominated in flocks, and verditer-green birds could, of course, have been immatures of either sex, thus introducing the possibility that dispersal behaviour is age-related. This was countered by a third record, of a party of ten visiting a fruiting banyan fig tree in Taman Negara National Park, in Malaysia, which specifically mentioned seven adult males, as well as the fact that this same, evidently stable combination of birds returned to the site repeatedly.

The possibility that prolonged socializing by this species really is at least weighted by sex, as stated, has implications for mating systems and breeding stategies. Nesting by captive Asian Fairy-bluebirds artificially isolated as pairs in aviaries, even though sometimes successful (see Breeding), may not have supplied the full story, and the slightness of sexual dimorphism in the Philippine Fairy-bluebird now suggests a bigger biological difference between the two species than had been suspected.

Both irenids are active birds. Their powerful, direct flight through and above the forest canopy gives them the potential for fast dispersal, where needed across habitat gaps, and potentially for long distances. Such behaviour is confirmed in the case of the Asian Fairy-bluebird, and is a clue to the modelling of this species' most likely general ecology, that of trap-lining around the known resources of a largish, shared range. Basic observations on the Philippine Fairy-bluebird seem still to be lacking.

Voice

Foraging pairs and parties of both irenid species give away their presence at a distance by frequent contact calls. These are loud, resonant but distinctively liquid monosyllabic and disyllabic whistles that carry far, including through foliage from the high canopy of forest. In the case of the Asian Fairy-bluebird, extra calls of similar sound quality come in as birds fly together in a group, but no equivalent calls have been described for the apparently less social Philippine species.

Other, longer vocalizations in which sounds of contact call type are strung together with a few added elements have been termed "song", but this classification is structural rather than functional, being based simply on complexity and duration of the vocalization. The Philippine Fairy-bluebird has been described as a fine singer. It is also said to be a good mimic of drongos and bulbuls, although E. C. Dickinson and colleagues remarked on the mimicking of this species, and of the Philippine race *tweeddalei* of the Asian Fairy-bluebird, by drongos themselves, specifically by the Balicassiao (*Dicrurus balicassius*) and the Hair-crested Drongo (*Dicrurus hottentottus*). The unscrambling of vocal mimic from model may not be straightforward.

Noisy Philippine Fairy-bluebirds, at least of the subspecies *ellae* and *hoogstraali*, can easily be attracted by a whistled imitation of their calling. That they take up a treetop station immediately above the sound source suggests that certain of their calls have a defensive function. No such claims have been made for the Asian Fairy-bluebird, although several participants in a gathering of foragers may "sing", or counter-sing, and some of this species' vocalizations have been placed in context from observations on individuals in aviaries. As defined, songs are exclusive to males. A "uiiit-uiiit-uiiit-uiit-uiit-uit-uit-uit" call is given regularly at dawn, and "do-re-me-hew-hew-hew" and a "wank" series, covering more than one subspecies, are likely to be no more than other renderings of this same call. Sounds linked directly with sexual display include one at the start of courtship which has been likened to a loud version of the long whistling vocalization of the Common Starling (*Sturnus vulgaris*), with "uit" notes interjected. Others, given during posturing to expose the dorsal blues, and with the body and tail vibrated and rocked from side to side, include a shrill, scratchy squeak and a "wii-dip-wii-dip-dip-wii-dip" sequence. A "whit-tu, whit-tu, whit-tu, whit-tu", recorded from the field as accompanying tail-pumping in which the tail-covert colours are flaunted, is surmised to be another impression of the same call, adding interesting possibilities with regard to the function of this behaviour.

Food and Feeding

In captivity, nestling Asian Fairy-bluebirds fed entirely by the parents developed and fledged successfully on a wholly insect diet, comprising mealworms, crickets (Tettigoniidae), caterpillars and moth pupae. Supplementary fruit was offered in one instance on day five, but otherwise apparently only after fledging. In the wild, some animal food continues to be taken into adulthood, at least by this species. Representatives of inner tropical populations have often been found in mixed parties of insectivores foraging at middle and canopy levels of forest, the subspecies *malayensis* and *crinigera*, and doubtless others, hawk termites (Isoptera) from nuptial swarms, and crop contents of Bornean *crinigera* have confirmed the taking of termites, ants (Hymenoptera) and beetles (Coleoptera).

On the other hand, after fledging, fruit, especially figs, is certainly the main food of both species, apparently throughout their respective ranges. Most *Ficus* species are dispersed by vertebrates and, at community level, in the kinds of humid environments supporting evergreen forest as opposed to deciduous growth, they parcel out the attentions of frugivores by staggering their crops through the year. On one 200-ha plot of the Kerau Wildlife Reserve, in Peninsular Malaysia, F. R. Lambert recorded fairy-bluebirds at 22 of the 25 bird-attracting species under study, these cropping from the middle stratum to the top-canopy level, and bearing fruit in the diameter range 5·4–27·7 mm. Other species have been added to the food list at other sites, and non-fig foods range across berries and drupes of many sorts, down to tiny, mass-produced fruits such as those of the forest-edge euphorb *Trema tomentosa*.

As revealed from the contents of stomachs, some items are fruits with large to very large seeds. It is assumed that such seeds, rather than passing through the gut, are regurgitated directly, and on average at a distance from the mother plant, given that parties of Asian Fairy-bluebirds typically retreat from the food tree between feeding bouts. The occurrence of oil palm (*Elaeis guineensis*) nuts in one or more stomachs of subspecies *crinigera* in Borneo suggested the experimental taking of an inappropriate food that probably could not have been processed unless first broken up. This is not a known type of behaviour of the Asian Fairy-bluebird, the typical action of which is to crush fruit before swallowing it, thereby raising the limit of manageable fruit size rather than its processability. It also demonstrated that the birds make visits to plantations, probably on the edge of forest, and reports of the taking of coffee berries (see below) demonstrate the opportunistic nature of fruit-finding by this species. Force would have been needed to extract an item from a fruit bunch of an oil palm, and this irenid normally perches only in order to deal with toughly attached items. Its main harvesting behaviour, akin to the taking of swarming termites, is the fly-up-to or fly-



Although the diet of adult fairy-bluebirds consists largely of fruit, they also consume a small but consistent amount of insect matter, such as beetles and alate termites, as demonstrated by this ***Asian Fairy-bluebird****. In common with many frugivorous birds, adults are unable to provision their brood with fruit because the mineral and protein content of such a diet is too low to sustain the growth of nestlings. Instead, if the evidence of captive birds is anything to go by, young fairy-bluebirds are fed a variety of insects, and only begin consuming fruit once they have fledged. To these ends, the irenid bill is robust and powerful, laterally compressed, and prominently notched and nailed, a design which not only helps in manipulating fruit, but also in catching and gripping insect prey.*

[*Irena puella andamanica*, Havelock Island, Andamans. Photo: Konrad Wothe]

past snatch, allowing the gathering of berries, such as those of *Eurycoma* (Simarubaceae), that grow on flimsy stems or long, hanging pedicels. Irenids have none of the pulp-sucking adaptations of the leafbirds, but they do have a more powerful bill, this being especially marked in the case of the Philippine Fairy-bluebird (see Morphological Aspects).

Two further, probably connected aspects of behaviour, both of the Asian Fairy-bluebird, deserve mention under this heading. One is the taking of nectar from large tree-crown blossoms, *Erythrina* and *Grevillea* species being the usual ones cited. The avifaunal literature of the Indian Subcontinent refers to this behaviour routinely, but no mention of it has been found in any primary source for this irenid in South-east Asia, and no reference at all has been found to flower-visiting by the Philippine Fairy-bluebird. The other concerns the alleged habit of Asian Fairy-bluebirds of regularly going to ground. This was described originally by Davison, in Tenasserim: "In the middle of the day they habitually come down to the banks of streams and the smaller rivers to drink and bathe." Widely copied on in secondary sources, this claim was flatly contradicted by Robinson, who stated that this species never comes to the ground. Specimen collection dates show that Davison's Tenasserim expeditions were all limited to dry seasons, whereas Robinson wrote of the ever-humid Malay Peninsula. The present author's own experience of the Asian Fairy-bluebird in Malaysia is of never having seen one on the ground, and of capturing some in a ground-set mist-net only once, close to a permanent pool in forest during an exceptional El Niño drought. It seems probable that nectar and forest streams constitute reliable emergency sources of liquid when the more usual supply of arboreal water, trapped in knotholes and similar places, runs out.

Breeding

Philippine Fairy-bluebirds with active gonads have been recorded in March, April and May, and a fledgling of the subspecies *ellae* is dated 5th August. P.C. Gonzales and C. P. Rees alone implied other knowledge of the species' breeding biology, in their 1988 introduction to the national avifauna, but these authors stated merely that the nest is cup-shaped. Otherwise, this irenid's habits and behaviour remain unknown. Asian Fairy-bluebirds in the Indian Subcontinent breed over the period January to June, with peak incidence during February to April. In northern Borneo, gonadal condition of specimens indicated breeding in December and February–August, and in Java nests have been found during October–May.

Most details of the breeding behaviour of the Asian Fairy-bluebird derive from observations made on captive birds. Pairs isolated in aviaries allopreened and called in unison. Male sexual display included presentation of the sleeked-down glossy blue upperparts as the scapulars were raised, vibration of the body and tail, with side-to-side movements that might alter the reflectivity of enamelled gloss, neck-stretching, and head-jerking with the cap feathers ruffled and the bill open, accompanied by song and an intensification of the red of the iris. There are reports from the field of males in gatherings vocalizing while persistently pumping or flipping the tail, thereby flashing the brightly coloured tail-coverts, but whether this behaviour is linked to sexual display as opposed to some other form of social signalling (see Morphological Aspects) has not been investigated. Only one aviculturalist's description mentions it, as a male signal to its mate during breeding, but this was not clearly in a courtship context.

The male's role, if any, in selecting a nest-site is unknown, but aviculturalists breeding Asian Fairy-bluebirds in aviaries all agree that nest-building, including the collection of materials, is undertaken by the female alone, her mate calling nearby but not visiting. In the wild, all reported nests of this species have been found in relatively dense, shaded parts of the understorey up to, but not above, the lower middle stratum of tall, closed-canopy forest. Built into the fork of a sapling or on a palm frond 2–6 m above ground, they are said to be small for the size of the bird, externally no more than 12 cm across, and formed into an unusually shallow saucer constructed mainly from twigs. The structure is flimsy enough to be seen through, making it difficult to spot nests from below, or camouflaged externally with green bryophytes, the egg-chamber often being lined with the

same material. The nests of the subspecies *malayensis* and *tweeddalei* have not been described.

One captive Asian Fairy-bluebird laid consecutive clutches of three eggs, but only two of either hatched, and in the wild, over the whole latitudinal range of the species, recorded clutches and broods have never been of more than two. The eggs are longish ovate in shape. They have a ground colour of pale grey-green or, exceptionally, buff, and are flecked all over to, more rarely, mainly over the broad end with brown, grey-brown and purple-grey. According to Stuart Baker, they measure 30·7–25·3 x 21·3–18·9 mm.

The female alone incubates, and the interval from egg-laying to hatching, measured in captivity, is 14 days. The young are fed mainly or wholly on insects, and they fledge mostly on their thirteenth day, extremes being 11 days and 18 days. Accounts of parental roles in aviaries vary, from all brood-tending being performed by the female alone, without any help from the male, to both sexes participating from hatching, and even to the bulk of chick-feeding duties being undertaken by the male. In one instance, recorded by L. Haye, within a single season, a male switched from taking no part in the rearing of the first brood to helping with the raising of the second-brood young. How this ties in with the behaviour of irenids in the wild, of course, is still unknown.

Not all aviary pairs are successful. In one of several captive-breeding episodes in France, an attempt was made to foster a rejected Asian Fairy-bluebird chick outside the aviary, in the nest of a wild pair of Eurasian Blackbirds (*Turdus merula*). The experiment was a success, apparently, until at a late stage the brood was raided by a garden dormouse (*Eliomys quercinus*).

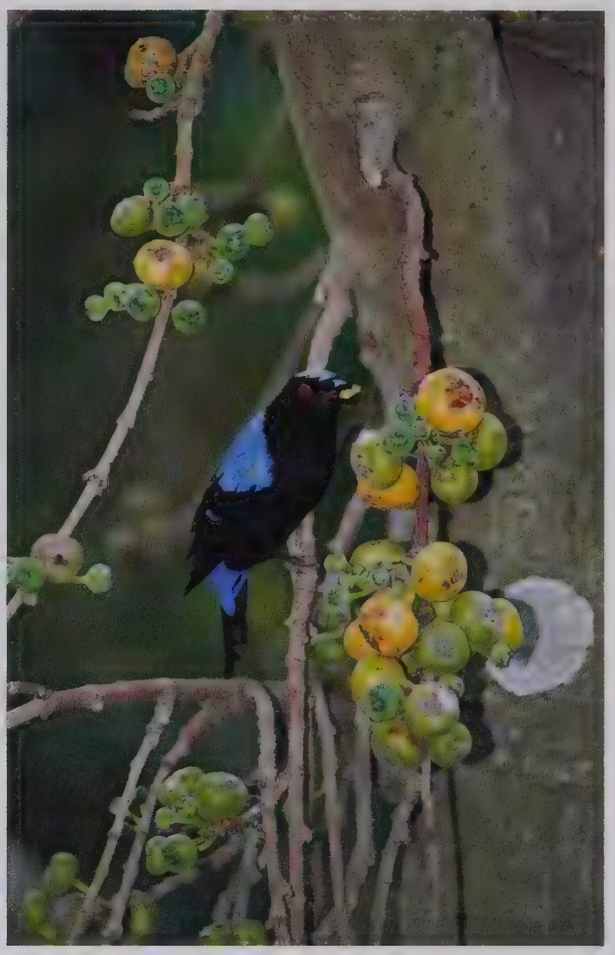
J. Stewart, who collected many nests of Asian Fairy-bluebirds in south-west India, claimed that on two or three occasions he found clutches with an egg of the Common Hawk-cuckoo (*Cuculus varius*). This is surprising, as the interior of evergreen forest, the nesting habitat of this irenid, is not where this particular parasitic cuckoo would be expected to occur. Identification seems to have rested on eggs alone and should be treated with caution, pending additional information.

Movements

Because of the nature of their habitat, fairy-bluebirds have rarely been mist-netted, very few indeed have been ringed, and no record has been found of any distant recovery of a marked individual. An understanding of their dispersal strategies has been pieced together from random, incidental observations only, and hence can be no more than provisional.

Irenids are powerful fliers, travelling fast through and above the forest canopy, and the Asian Fairy-bluebird, at least, is able and willing to cross ecological barriers, including tracts of non-forested habitat. The latter may stretch to sea gaps if it is reasonable to assume that records of this species from some little islands off the coast of the Malay Peninsula involve visitors rather than permanent residents, but no cross-water movements have been confirmed. A generalized model of how these birds live is suggested above (see General Habits), but it is not known what distances they actually travel between successive feeding stations, and not even a guess has been hazarded as to how large a patch they patrol over longer, seasonal or annual, timespans.

Although fairy-bluebirds do disappear locally, they are rarely absent from a given site for long, they never feed far from forest, and no record has been found of any having been intercepted while dispersing at night. There is no reason to believe, therefore, that either species is truly nomadic in any part of its range. S. Ali and S. D. Ripley, in the second edition of their *Handbook of the Birds of India and Pakistan*, mentioned the seasonal occurrence of Asian Fairy-bluebirds on the Coorg Plateau of the Western Ghat Range, where the species is said to be a winter dry-season visitor. Its appearance there, however, may involve no more than local upward movements off neighbouring slopes, as occurs among presumed trap-lining foragers elsewhere in the species' range. No difference may exist between this phenomenon and the intermittent visits made by other populations to montane forests of less seasonal South-east Asian mountains, over similar elevational spans and within believable daily ranging distances.



In general, fairy-bluebirds forage in the canopy, but they do visit the darker reaches of the middle and lower storeys to nest, and to harvest supplies of fruit. In this instance, a male ***Asian Fairy-bluebird*** *has descended to fruit that is developing close to the stem of a forest tree, a phenomenon termed cauliflory. This individual is making use of a convenient perch adjacent to the fruit itself, in this case figs* (Ficus)*, but when food is less accessible it is common for irenids to hover momentarily and snatch fruit in flight before returning to a perch. This photo also reveals that large fruits are not taken whole, but nibbled when ripe.*

[*Irena puella puella*, Thailand.
Photo: Roland Seitre]

Periodic altitudinal excursions to exploit well-synchronized flower and/or fruit crops would be expected in many parts of the family's range, much as visits are made to exploit occasional mass fruitings in exceptional types of inner tropical lowland habitat, such as heath-forest, which are otherwise avoided. Patterns of fruit availability in forests on the comparatively fertile, volcanic soils of much of the Philippines, on the other hand, could mean that the Philippine Fairy-bluebird has had less need to travel.

Relationship with Man

Despite the gaudy appearance of the two fairy-bluebirds, they seem not to have any special human cultural connotation or, at least, none that has come to light. Before the great days of rubber and oil palm, pioneer planters in the Malay Peninsula grew lowland coffee under original or planted shade, on gardens or small estates cut directly out of mature forest. As told by W. T. Page in 1913, they knew the Asian Fairy-bluebird well, as "the Coffee Bird", for its raids on their berry crops. Nowhere is there any allusion to this species' former status as an actual pest, but its visits to a sudden, plentiful addition to the regular round of neighbourhood fruit supplies must have been common and obvious enough to have generated the special name. Identification of the fruit of oil palm in the stomach contents of fairy-bluebirds from Borneo (see Food and Feeding) was a surprise, however, as fairy-bluebirds are hardly known as visitors to palm plantations.

Not surprisingly, the main human interest in these birds has been aesthetic, as cagebirds, within the region and also in international trade. Private aviculturalists and several zoos in Europe and America have kept, bred and raised fairy-bluebirds successfully in aviaries, although all published accounts available refer just to the more spectacular Asian Fairy-bluebird, and all but one to its nominate race, the sole exception being one about the western Philippine subspecies *tweeddalei*.

Status and Conservation

Treetop-foraging parties of irenids tend to give themselves away by their loud, far-carrying contact calls (see Voice). This noisiness, and the regularity of their attendance at mass fruitings have been elements in the perception of these birds as more or less common to actually very common over most of their respective ranges. On Palawan, in the early twentieth century, the subspecies *tweeddalei* of the Asian Fairy-bluebird impressed W. P. Lowe as being one of the commonest or, at least, most visible forest birds of the island, and the Sumatran literature includes an account of a daily movement by hundreds of individuals of the subspecies *crinigera*. These reports date from before the days of large-scale timber extraction and the mass onslaught on South-east Asian lowland forest cover, but in the 1980s Sheldon and colleagues were still able to describe *crinigera* as commuting in "large flocks" between blocks of Sabahan forest, in northern Borneo. No such numbers have ever been described from anywhere in the range of the Philippine Fairy-bluebird, a contrast noted by the explorer-naturalist J. Whitehead more than a century ago, in the 1890s, hence hinting at some ecology-based difference rather than a direct status issue. Even now, field contacts with both species range from routine to at least not exceptional, and neither receives a mention in recent BirdLife International Red Data publications covering the birds of Asia.

The situation of taxa below species level is less comfortable, given that more than 90% of the global habitat space for some fairy-bluebird subspecies has been lost outright to deforestation, and the rest seriously fragmented. Visible they may still be, but common sense rejects the possibility that no serious damage has been done to these birds at population level. Indeed, over the past century, all four subspecies of the Philippine Fairy-bluebird have vanished from most of their recent ranges owing to habitat loss. The prognosis for what suitable forest remains suggests that all of them should be placed in the conservation category of Near-threatened, if not that of Vulnerable. In the case of the Asian Fairy-bluebird, massive loss of habitat, coupled with rising pressure from hunting with guns, makes it unlikely that the Javan subspecies *turcosa*, *crinigera* in Sumatra and Philippine *tweeddalei*, at least, have not already reached one or the other of those two categories. Even in forest where timber production is carried on sustainably, the common sylvicultural practice of removing large, canopy-cropping *Ficus* species has a disproportionately high impact on frugivores reliant on figs as a key food source (see Food and Feeding).

In the background to this lies the mystery of the disappearance of the Asian Fairy-bluebird from Sri Lanka, from an area potentially larger than the historical ranges of some still extant, even still common, taxa elsewhere. Recorded observations, all in the ever-humid south-west quadrant of the island, date from the era of first exploration by ornithologists, from the 1840s to 1877, although the latter year may not, of course, have been the one of actual biological extinction. Opinion on the species' status in Sri Lanka has varied. A recent edition of G. M. Henry's *Guide to the Birds of Sri Lanka*, published in 1998, pointed out that fairy-bluebirds are even now imported as cagebirds, implying that the release of exotic captives for merit in a Buddhist stronghold would have been likely, but without then considering why this practice should have stopped. Others have suggested that Sri Lanka received migrants, presumably from India; but fairy-bluebirds are absent from the south-east Indian presumed area of departure and landfall, and for good ecological reasons. If such journeys ever really did occur, they would need to have been a good deal longer than just the sea-crossing.

Although there have been a few vague claims of Asian Fairy-bluebirds being observed in Sri Lanka in the twentieth century, no reliable evidence of a wild/free-living presence of the species on the island dates from later than the 1870s.

The real issue here is that populations are constrainable at any point in their annual cycle. The scenario suggested is that nineteenth-century recorders witnessed one already in the last stages of running out of fuel as its humid-forest biome gave way to other land uses, notably spice-planting, an industry established in that quarter of Sri Lanka even before the end of the eighteenth century. Conventionally, individual survival is understood to be a matter of energy uptake traded against expenditure, including that on its procurement. Fragmentation of fairy-bluebird habitat by deforestation has several adverse effects: it randomly removes customary ports of call for foraging, forcing a search for replacements cropping on a similar cycle; progressively, it reduces the options for such replacements, thereby expanding the required minimum search area; finally, as habitat patches shrink and retreat, it stretches searching/journeying time versus feeding time to the point at which the daily budget ceases to balance. Some tropical Asian forest frugivores compensate for the scope of their travel by shifting it to the night, but fairy-bluebirds are not known to do so (see Movements). What that conjures up is a picture less of a slow dwindling-away than of whole subpopulations shifting rather suddenly from a position of having just got by, perhaps with breeding or migration capacity impaired, to one of going rather suddenly, collectively, past the point of no return.

This is no more than a model of an explanation, but is one that could have applied to Asian Fairy-bluebird history elsewhere in the Indian Subcontinent, where southern and northern populations of the nominate race are suspected of having lost contact as suitable forest habitat became fragmented and shrank. A. Sondhi mentions the disappearance of this bird around 1990 from one intermediate relic, Bimashankar Wildlife Sanctuary, a still rich but isolated block of evergreen forest north-west of Pune, in the state of Maharashtra. Globally, this subspecies happens to have much space left, but the idea could be important for projecting what may be about to happen to other, more restricted irenid taxa suffering habitat loss elsewhere. Standing numbers alone are unlikely to be a sensitive indicator of conservation status.



Both species of irenid are locally common, but the ***Philippine Fairy-bluebird*** *is restricted to the increasingly man-modified landscape of the Philippine archipelago, and must have suffered severe population declines as a result of deforestation and hunting. The reliance of both species on fruiting trees, a resource that fluctuates in space and time alike, increases the likelihood of local extinction when forests are broken up into ever-receding fragments. In all cases, the area of suitable habitat under protection should be expanded, and fairy-bluebird populations, especially those already isolated, should be monitored carefully.*

[*Irena cyanogastra cyanogastra*, Quezon National Park, Luzon, Philippines. Photo: Pete Morris]

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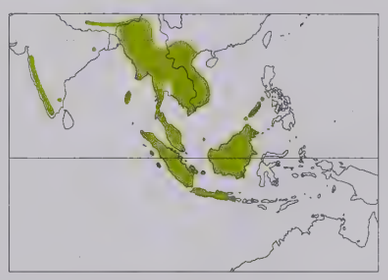
Genus *IRENA* Horsfield, 1821

1. Asian Fairy-bluebird

Irena puella

French: Irène vierge **German**: Türkisfeenvogel **Spanish**: Irena Dorsiazul
Other common names: Blue-backed/Blue-mantled Fairy-bluebird; Palawan Fairy-bluebird (*tweeddalei*)

Taxonomy. *Coracias Puella* Latham, 1790, Travancore, southern Kerala, India.
Formerly considered conspecific with *I. cyanogastra*. Race *andamanica* treated as synonymous with nominate by some authors, but differs in having heavier bill. Birds from N Indian Subcontinent, described as race *sikkimensis*, considered better treated within nominate. Body size varies with latitude, outer tropical populations of nominate being largest, equatorial *crinigera* smallest. Race *tweeddalei* has sometimes been spelt *tweeddalii*, following very slightly later usage by same author; latter, however, must be rejected as unjustified emendation or incorrect subsequent spelling. Six subspecies recognized.
Subspecies and Distribution.
I. p. puella (Latham, 1790) – SW, S & NE Indian Subcontinent E to extreme S China (S Yunnan), S in continental SE Asia to N Malay Peninsula and S Vietnam.
I. p. andamanica Abdulali, 1964 – Andaman and Nicobar Is.
I. p. malayensis F. Moore, 1854 – S Malay Peninsula.
I. p. crinigera Sharpe, 1877 – Sumatra (including islands off W coast), Bangka, Belitung and Borneo.
I. p. turcosa Walden, 1870 – Java.
I. p. tweeddalei Sharpe, 1877 – W Philippines (Calamians, Palawan, Balabac).
Descriptive notes. 21·2–25·8 cm; male 56·6–75·7 g, female 52–71·2 g (*malayensis*). Strongly dichromatic. Adult male nominate race has frontal band over bill base, conjoined lores and side of head to well above eye, side of neck, entire underparts (except undertail-coverts), wings (apart from lesser and median wing-coverts) and tail deep black; remaining plumage, including tips of tertials, brilliant blue, "enamel-glossed" especially on cap and upperparts by modified outer barbs; hidden bases of these blue feathers variably (non-glossed) verditer-green to, on upper neck, black; some individuals have black or grey shaft streaks on body and/or upperwing-coverts; iris bright blood-red; bill all black; feet black. Adult female (some with dark shaft streaks, as male) has head, body and upperwing-coverts, tertials and central tail feathers subdued verditer-green, feather edging slightly bluer (hence slightly brighter) on rump, uppertail-coverts and underparts; remaining plumage sooty brown, verditer only on outer webs of other tail feathers and on external edging of flight-feathers; iris paler, brick-red or orange-red. Juvenile is like female, except that wings are all brown, iris brown; plumage soon replaced, immature closely resembles female (male slightly bluer) and safely separated only by browner iris colour. Races vary mainly in colour tone of blue parts of adult male, and tail-covert shape and length: *andamanica* differs from nominate by heavy bill, broader and marginally deeper than in any other race; *malayensis* resembles nominate, but tail-coverts longer; *crinigera* is smallest, tail-coverts completely encase tail, above and below, to slightly beyond its tip; *turcosa* has tail-coverts as previous, but is on average slightly larger; *tweeddalei* is distinctive, male blue areas cold azure to turquoise-blue (rather than violet-tinted royal blue), other age/sex-classes duller. Voice. Various liquid, whistling monosyllabic and disyllabic contact calls, strident and carrying: nominate race "weet weet", "be-quick", "what's it", "djü-djüt", "uiiit", "tui, wit-weet" and similar, also "which-ip which-ip which-ip"; *malayensis* "wait" or "whi-it" or "whit, whet, whit". Flight calls "chichichichik", repeated every few seconds, a repeated "chir-ip", also "twing-twing" or "wit wit wit". Possible songs or song elements by male: "tu-lip wae-waet-oo", "do-re-me-hew-hew-hew", "uiiit-uiiit-uiiit-uiit-uit-uit-uit-uit", "whit-tu, whit-tu, whit-tu, whit-tu" with tail-jerking (all nominate); wavering "u-iu" (*malayensis*); 7–8 "wank" sounds which descend slightly and become broader, more profound towards end (*crinigera*); "wheep-wheep pul paaawwww", phrase 1 second long, repeated serially, and "hu we-u whíp-tip hu wee-u" (*tweeddalei*). Male nominate race during courtship display "wii-dip-wii-dip-dip wii-dip...", and whistle like that of Common Starling (*Sturnus vulgaris*). Also, a hoarse "chrroachch" croak between pair-members at close quarters, and thin "wi-wi-wi..." from a female (with bill closed) when resisting being displaced.



Habitat. Tall tropical to subtropical lowland broadleaf evergreen to semi-evergreen forest, and comparable montane forest; from plains level to 1800 m in Indian Subcontinent (Western Ghats, E Himalayan foothills of Bhutan), but generally lower in N (to 1200 m in Sikkim, 850 m in Nepal); occasionally to 1900 m in Malay Peninsula, but everywhere much commoner below montane ecotone. Avoids deciduous forest, but recorded as visiting low-stature heath-forest in Borneo and

degraded forest in parts of Sumatra; emerges from regular habitat into scattered trees of tea estates and shade cover of coffee plantations cut out of forest, presumably where tempted by a flowering or fruiting event.

Food and Feeding. Diet mainly fruit, ranging from small berries to figs (*Ficus*); also nectar in more seasonal parts of range, but nectar-feeding unrecorded in humid inner tropics; alate termites (Isoptera) also taken. Food of wild nestlings unreported; in captivity, chicks have thrived on a diet exclusively of live insects delivered independently by parents, with fruit offered mainly after fledging. Fruits taken while perched or in a flying snatch, mainly in middle stratum and canopy of forest; termites caught in air. Regularly joins mixed-species parties of insectivores hunting among foliage. Raids coffee berries.

Breeding. Season Jan–Jun, peak Feb–Apr, in Indian Subcontinent; mainly on gonad condition of specimens, Dec and Feb–Aug in N Borneo (Sabah), and Oct–May in Java. Nest, built by female, a relatively small, unusually shallow, flimsy open cup of twigs and bryophytes, placed 2–6 m up on sapling fork or palm frond in shaded understorey to lower middle stratum of forest. Normal clutch 2 eggs; in captivity, incubation by female alone, period c. 14 days, nestlings tended by one or both parents, fledging period c. 13 days (extremes 11–18 days). Reported brood parasitism by Common Hawk-cuckoo (*Cuculus varius*) in S India thought unlikely on grounds of habitat, requires verification.

Movements. Essentially resident. Said to be a seasonal (winter) visitor to Coorg Plateau, in Western Ghats (SW India), but this may not involve more than local upward movements off neighbouring slopes. Records from some tiny islands of SE Asian continental shelf presumed to involve only visitors, but no cross-water movements confirmed.

Status and Conservation. Not globally threatened. More or less common through most of range; only locally uncommon or rare. Formerly occurred in Sri Lanka; apparently, disappeared from there in late 19th century. Massive loss of habitat, and increasing hunting pressure with guns, have led to significant declines in Java (race *turcosa*), Sumatra (*crinigera*) and W Philippines (*tweeddalei*); populations in those regions, at least, require re-assessment of conservation status, probably already Near-threatened or even Vulnerable. Removal of large, canopy-cropping fig trees, a common sylvicultural practice even in forest where sustainable logging carried out, has disproportionately high impact on frugivores reliant on figs as a key food source. Effects of trapping for cagebird trade not known.

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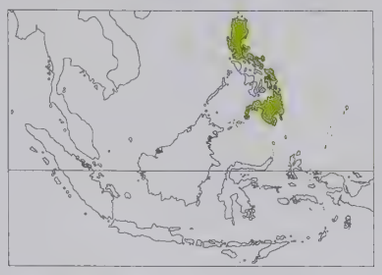
2. Philippine Fairy-bluebird

Irena cyanogastra

French: Irène à ventre bleu **German**: Kobaltfeenvogel **Spanish**: Irena Dorsinegra
Other common names: Black-mantled Fairy-bluebird

Taxonomy. *Irena cyanogastra* Vigors, 1831, Manila, Luzon, Philippines.
Formerly considered conspecific with *I. puella*. Species name sometimes given as *cyanogaster*, but this is an unjustified emendation. Four subspecies recognized.

Subspecies and Distribution.
I. c. cyanogastra Vigors, 1831 – Luzon, Polillo and Catanduanes.
I. c. ellae Steere, 1890 – Samar, Leyte and Bohol.
I. c. hoogstraali Rand, 1948 – Dinagat and Mindanao.
I. c. melanochlamys, Sharpe, 1877 – Basilan.



Descriptive notes. 23·3–27·5 cm; male 71–96·1 g and female 75·9–89·7 g (*ellae*), two males 72 g and 76 g and four females 69·4–78·4 g (*hoogstraali*). Adult male nominate race has frontal band above bill, lores, face to well above eye, side of neck, and chin, throat and upper breast deep black, with only slight sheen; rest of cap rich, glossy royal blue with violet tinge, colour petering out on upper neck; rest of neck, scapulars and whole upper body deep indigo-blue, progressively more broadly tipped glossy royal blue from rump to uppertail-coverts; lesser and median wing-coverts blue-black, broadly tipped glossy royal blue; greater coverts black, outer webs of inner part of tract royal blue but darkening descendantly and blue retreating towards outer-web tip, leaving outer tract all black; alula and primary coverts all dull black; central pair of tail feathers dull indigo, blackening towards tip, rest of tail black, except outer webs of T2–5 indigo with brighter fringes; underparts below breast deep indigo; undertail-coverts deep indigo-blue, broadly tipped glossy royal blue; iris blood-red; bill black; feet black. Adult female resembles male but slightly duller, demarcation of ventral indigo against black less sharp; one individual with dark shaft-streak aberration on cap. Fledgling still growing flight-feathers and tail is adult-like, but less blue on still-growing tail-coverts; other pre-adult plumages undescribed. Races vary chiefly in extent of black (versus indigo) on upperparts (none in nominate) and underparts: *ellae* has upper neck, mantle and scapulars black, chin to rear-flank level black, rectrices without brighter fringes, female indigo below breast; *hoogstraali* has upperparts and tail as previous, black below only down to breast; *melanochlamys* differs from last only in smaller size. Voice. During presumed breeding season very noisy, and a mimic; apparent song "whip whip whip-aaww" or "weep weep weep paw", repeated directly or at intervals, often several birds calling together. Responds to whistled imitations of contact calls and approaches human caller.

Habitat. Tall, mainly closed-canopy lowland broadleaf evergreen forest, and equivalent lower montane forest, from plains level to c. 1500 m. Forages out to forest edge; recorded also as visiting "lower growth" (= degraded forest?) on Leyte.

Food and Feeding. Confirmed items include only fruit, especially figs (*Ficus*), but diet unlikely to differ much from that of *I. puella*. Forages almost wholly in top canopy, even more so than *I. puella*, venturing also to fruit crops at forest edge. Fruits searched for probably by trap-lining around known sites, but perhaps not socially, as gatherings at food sources seem not to behave as cohesive flocks.

Breeding. Adults with active gonads in Mar, Apr and May, and a fledgling (of race *ellae*) in early Aug. Nest said to be cup-shaped. No other information.

Movements. Resident.

Status and Conservation. Not globally threatened. Reported as common. Has declined; ranges of all races have contracted and become fragmented owing to extensive habitat loss from deforestation. Should probably be accorded conservation status of Near-threatened, if not Vulnerable.

Bibliography. David & Gosselin 2002a, Delacour & Mayr (1946), Dickinson *et al.* (1991), Gilliard (1950), Gonzales & Rees (1988), Goodman & Gonzales (1990), Hachisuka (1935), Inskipp *et al.* (1996), Kennedy *et al.* (2000), McGregor (1909–1910), Parkes (1973), duPont (1971), duPont & Rabor (1973b), Rand & Rabor (1960), Whitehead (1899a).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family AEGITHINIDAE (IORAS)



- Small, arboreal insectivores with straight, rather long, notch-tipped, pale bill, and minute rictal bristles; plumage combining greens, yellows, black and white, with unusually long flank feathers silky white.
- 11·5–15·5 cm.



- Oriental Region.
- Thorny acacia savanna to deciduous and evergreen lowland forests, extending to mangroves, secondary growth, plantations and wooded gardens.
- 1 genus, 4 species, 17 taxa.
- No species threatened; none extinct since 1600.

Systematics

Linnean genera dealt with structure on a grand scale, and speculation among ornithologists of the day about the nature of the bird that the great man had named *Motacilla Tiphia* ranged from "flycatcher" or "finch" to "warbler" and, later, "babbler". Over 50 years later, in the early nineteenth century, the taxonomist L. P. Vieillot based the genus *Aegithina* on a "warbler", but one that, he believed, hailed from North America. In 1821, decades before Vieillot's key illustration was reinterpreted, T. Horsfield published the rival name *Iora*, attached to an undoubted specimen from Java. Adopted in 1840 by G. R. Gray, who thought that *Aegithina* might actually have been meant for a tit (Paridae), and grouped in the now eccentric-sounding subfamily Accentorinae of the "Sylviadae", this second name became the favoured option. Ultimately, Gray himself back-tracked, and nearly 30 years later, in 1869, erected an actual family Aegithinidae, but he filled it with babbler (Timaliidae) genera, sandwiching *Aegithina* between *Mixornis* (the modern-day *Macronous*) and *Malacopteron*.

A decade before that, E. Blyth had taken a different tack. Working at the Calcutta museum, in India, and likely to have been familiar with representatives of these avian groups in nature, he had allied the ioras with the leafbirds (*Chloropsis*, but then placed in *Phyllornis*) and the fairy-bluebirds (*Irena*) in an exclusive subfamily, Phyllorninae, of the bulbuls (Pycnonotidae). Blyth's was the scheme adopted in 1882 by R. B. Sharpe in volume six of the landmark *Catalogue of the Birds in the British Museum*, except that, by then, bulbuls, too, were being treated as babbler allies; indeed, Sharpe went to the limit by squeezing the entire group, phyllornines included, into just one subfamily of the Timaliidae. Support for this dramatic act of lumping lasted well into the new century. As it waned, H. C. Robinson re-erected a family Aegithinidae, this time exclusively for ioras and leafbirds, but he still viewed these as intermediate between bulbuls and babblers.

In 1960, J. L. Peters's *Check-list of Birds of the World* reconnected ioras and leafbirds with fairy-bluebirds in a family Irenidae, sitting next to Pycnonotidae. The reviewer, J. Delacour, may have missed A. Wetmore's osteological evidence, involving palate structure, for maintaining iora links with leafbirds alone. This was published in the same year, whereas seven years previously W. J. Beecher had used comparative anatomy of the jaw musculature to distance *Aegithina* from all of its former associates.

More recent, molecular-level taxonomic work has furnished its usual round of shock results, with support remaining for only a few of these morphology-based ideas. Pioneer experiments with DNA–DNA hybridization, published by C. G. Sibley and J. E. Ahlquist in 1990, located *Aegithina* as the sister-group of a greatly expanded bush-shrike subfamily, Malaconotinae, at the heart of these authors' oscine "parvorder" Corvida. *Chloropsis* and *Irena* they placed near the base of Corvida, indicating that they considered these two genera to be more ancient. A decade later, in the first year of the twenty-first century, the results of nuclear-DNA base-sequence comparisons by F. K. Barker and colleagues, reviewed by J. Cracraft and co-workers in 2003, provided good support for *Aegithina* as being the sister-taxon of an array of "corvidan" birds, including woodswallows (Artamidae), butcherbirds (Cracticidae) and vangas (Vangidae), but severed other links decisively by transferring *Chloropsis* and *Irena* to Sibley and Ahlquist's other parvorder, Passerida. Hypothetical links with flycatchers (Muscicapidae), warblers (Sylviidae), babblers and bulbuls, all "passeridan", had automatically already been cut and, for the first time, the ioras gained exclusive family status. They are given it herein, but are kept close to the formerly associated leafbirds and fairy-bluebirds, which is where those relying on the traditional "Wetmore sequence" would still expect to find them.

Much of the above has had to do with researching just one widespread species, the Common Iora (*Aegithina tiphia*). The other members of the family, although less well known, are superficially similar. For a part of its taxonomic history, the Southeast Asian Great Iora (*Aegithina lafresnayei*) was assigned a separate genus, *Aethorhynchus*, but it is now generally viewed as merely being larger than its cousins, with no need of any such split.

The family is safely monogeneric, but how many biological species it includes has, until recently, hung on what relationship the south Asian Marshall's Iora (*Aegithina nigrolutea*) is considered to have with the Common Iora. These confusing birds have overlapping ranges, but Marshall's Iora is well known only in north-central India, principally in the states of Gujarat, Rajasthan and Uttar Pradesh. There, it appears that the two partition living space by habitat, Marshall's selecting or being restricted to the more arid biotopes. The ecological record stops at that, and recent authors have continued to express doubt about the status of *nigrolutea* and *tiphia* as separate species, even though the standard handbook on south Asian birds, by S. Ali and S. D. Ripley,

records that, in the field in Gujarat, its senior author was able to separate them "at once" by ear.

During the breeding season in north-central India, male Marshall's Ioras sport a bright yellow collar, replicated with only slightly broader black feather fringing among co-occurring male Common Ioras of the subspecies *humei*, but reduced in more distant populations. From this observation sprang a suggestion, by H. Whistler and N. B. Kinnear, that variation in the Common Iora breeding plumage through peninsular India might involve intergradation with *nigrolutea*. Whistler was also aware that deep within *tiphia* country, remote from the "core" northern range of *nigrolutea*, occasional individuals displayed the latter's characteristic silvery or black, boldly white-edged tail. These, he reasoned, were Common Ioras exhibiting more *nigrolutea* influence than normal, and he singled out a southern Indian example from the hills of Coimbatore district, in the state of Tamil Nadu.

In 1952, D. Marien, the first modern reviser of this part of the genus, took these "variants" to be actual *A. nigrolutea*, but queried the species' breeding status away from northern India. He is presumed to have suspected non-breeding dispersal or migration by *nigrolutea* into the greater range of *tiphia*. Five years later, B. P. Hall mapped them nominally as *A. nigrolutea*, but made clear that she preferred to view them rather as exceptional products of *nigrolutea* influence on *A. tiphia*. She then formalized Whistler and Kinnear's proposal by portraying north-central Indian "*nigrolutea*" as the end point of clines of plumage coloration running north through Common Iora populations. A geographical fit of "variant" individuals into these clines was implied, with particular mention made of one post-juvenile male from Uva province, in south-east Sri Lanka, that showed a *nigrolutea*-type tail but had an upper body as dark green as that of typical local Common Ioras of the subspecies *multicolor*, at the extreme outer end of a cline in that character.

Hall's interpretation is still a widely held one, but it ceased to be the simplest available when, in 2003, D. R. Wells and colleagues shifted the focus from just tail pattern to a fuller diagnosis of Marshall's Iora versus Common Iora. This added, for the former, the characters of an absolutely smaller bill and, measured sex for sex, a shorter tail, while P. C. Rasmussen and J. C. Anderton noted the boldly white-tipped, as opposed to mainly black-tipped, tertials and inner secondaries of Marshall's Iora. With that, both of the southern "variant" specimens mentioned above shifted to the far end of the morphological spectrum, away from *tiphia*, including from series of the latter collected in the same areas. With an indication that some features may actually have diverged with distance away from north-central India, this then argued for the acceptance of these birds either as *A. nigrolutea* proper or as some related taxon yet to be named. The simpler option prevailed. From there it was a small step to accepting geographical variation in two independent species, thence to the possibility of some of that variation proceeding in parallel, which would explain the match of green colours and other characters. The upshot is a formal argument for accepting Marshall's and Common Ioras as two good species and, from the total distribution of "variants", for recognition that both may occur over most of the Indian Subcontinent, including Sri Lanka.

Barring a few small equatorial islands and tiny fringe of semi-desert, the distribution of the Common Iora alone defines the global range of the family. For good reasons, this species has long been a troublesome bird for taxonomists; indeed, some of the questions posed by the far-sighted A. O. Hume in his pioneer 1877 essay on iora systematics are still open. The currently accepted subspecies of the Common Iora are those allowed by Marien on the basis of variation of male breeding plumage, adjusted by Hall after a parallel analysis of the non-breeding, so-called "eclipse" plumage (see Morphological Aspects). Predictably, they have not been challenged, but one of the changes made raised an issue that new theoretical interest in species would not let pass. It introduced a taxon, *A. t. deignani*, defined by its describer, Hall, as grey-green on the cap and upper body of the eclipse-plumaged male and on the lower back and rump of the breeding male, this colour being intermediate between the chalky-washed lime-green of these plumage parts in the north-central Indian race *humei* and the black-dusted dark grass-green of south



Early taxonomists were at a loss regarding which family they should assign the ioras to, and they vacillated between calling them "finches", "warblers", "flycatchers" or "babblers". They were later linked with bulbuls (Pycnonotidae) and leafbirds (Chloropseidae), until recent genetic research placed them in a family of their own. While vague similarities to all the above groups are apparent, this female ***Common Iora*** *bears a stronger resemblance in structure and pattern to some members of the New World Vireonidae, and indeed these ioras and vireos, so widely separated geographically and taxonomically, probably occupy similar ecological niches. The plumage of ioras tends towards olive and yellow and all members of the group have dark wings, most of them with striking pale wingbars.*

[*Aegithina tiphia aequanimis*, Sabah, Borneo. Photo: Roland Seitre]



*While the male **Common Iora** tends to be blacker-backed than the female, this difference is not always clear-cut throughout the year, or across the geographical range of the species. In some races, such as Indian* humei, *males have black upperparts in the breeding season, but return to female-type plumage with a post-nuptial moult. Males from the Malay Peninsula, meanwhile, seem to vary individually but consistently throughout the year: the upperparts of some are only slightly darker than females, while in others, like this one, they are permanently black.*

[*Aegithina tiphia horizoptera*, Krangi Dam, Singapore. Photo: Jimmy Chew]

Indian and Sri Lankan *multicolor*. Having thus defined it in relation to these south Asian races, Hall gave *deignani* a type locality not in India, but in central Myanmar, and with this an entirely separate Myanmar distribution, remote from its Indian range between *humei* and *multicolor*.

Among sedentary birds, disjunct distributions down to subspecies level might arise from the rare, chance crossing of a barrier, or where recent extinction has broken population continuity and, for ecological reasons, left a gap. No such arguments apply in this case. Common Ioras occur continuously around the two range parts of *deignani*, and two other subspecies fill the whole space between them. Assuming that *A. tiphia*, as constituted here, is indeed a single species and that, as observed, its populations intergrade freely where they meet, creating, incidentally, notorious identification problems, most contacting populations ought also to be one another's nearest genetic neighbour. The two half-populations of *deignani* may pass as an entity morphologically, but they should be less closely related mutually than either one is to other subspecies. Given Hall's own remark that *deignani* characters are expressed more uniformly in Myanmar than in India, and the later comment, by H. Abdulali in 1981, that Indian *deignani* "is a very difficult race to separate", Wells and colleagues recently opted to restrict this taxon to the Myanmar part of its range. For the Indian part, they reinstated a broad zone of intergradation between *humei* and *multicolor*, populations within which were in the past assigned nominally to one or other of these two subspecies but are more sensibly left unaligned. In this zone, resemblance to Myanmar *deignani* proper is taken to be convergent, and similar grey-green plumage colours should be looked for in zones of contact between lighter and darker subspecies elsewhere in the Common Iora's range. Incidentally, this action nearly parallels one taken by Hall herself for dealing with a disjunct distribution left in Marien's definition of the range of the nominate race of this species, South-east Asian populations of which acquired the separate names of *A. t. philipi* and *A. t. cambodiana*.

Morphological Aspects

Ioras are small to medium-small passerines, about 11·5–15·5 cm in total length. Common and Marshall's Ioras have an adult male wing length of 60–67 mm, little different from the 61–68 mm of the Green Iora (*Aegithina viridissima*), while the wing of the slightly larger Great Iora measures 69–74 mm. All have blunt wingtips, typical of sedentary surface-gleaners. The blue-grey bill is straight, proportionately rather long and, except in the case of Marshall's Iora, slightly inflated, showing little taper along its length, with a finely notched and nailed upper mandible. Culmen length measures up to 16·5 mm in Marshall's Iora, 18·3 mm in the Green Iora, 19·5 mm in the Common Iora and 25·2 mm in the Great Iora. No species exhibits more than rudimentary development of the rictal bristles.

Despite some overlap at population level, males of all species are on average larger than females in all standard measurements except tail length. Among the smaller species, males are in fact shorter-tailed than females, absolutely so in some populations of the Common Iora, but only as adults. Juvenile males' tails are as long as those of females of all age-classes, and the new-grown first adult tail of a male Common Iora can be 5 mm to as much as 8 mm shorter than the one that it replaces. In foraging terms, when prey are taken by acrobatic reaching, the difference could carry a fitness cost. It is therefore suspected to have a special adaptive explanation. No research on this has been done, but comparison with another group having this same characteristic hints at a possibility. The three calyptomenine broadbills (Eurylaimidae) all show it strikingly, and an aspect of behaviour that at least some species of these two remotely different kinds of bird have in common is acrobatic sexual display-flying, strictly by males. Perhaps a proportionately short tail conveys some performance advantage, but this is no more than a guess. Male Marshall's and Common Ioras are well-recognized acrobatic displayers (but see Breeding). The Green Iora, with an equally reversed dimorphic tail, has not been recorded as displaying acrobatically, although

it is difficult to study in its rainforest-canopy living space, while the only described display of the Great Iora was simple by comparison, and this one member of the family shows no sexual tail dimorphism.

A second special feature, exaggerated in males of all iora species, is the soft, silky-white plumage of the upper flanks. Abundant, unusually long, and erectile together with other long dorsal feathering, this becomes a weather-guard during roosting and brooding. During ordinary flight, it is arched over the upperparts in what may be a signal display, this being the source of repeated claims that ioras have a white rump. The male's flank feathering also features in courtship displays (see Breeding).

Adult ioras of all four species show a degree of sexual dichromatism. In the case of the Green Iora, this involves most of the plumage, but in other species, basically, only wing colour and the richness of yellow on the face and underparts are affected. The colour of the central tail feathers of Marshall's Iora is black in males and silvery grey in females, and male Common Ioras of most, but not all, subspecies have black uppertail-coverts and tail, whereas these parts are green in females. In detail, apart from fine white or yellow edging on the outer webs of the flight-feathers, male wings are either wholly deep black, as those of the Great Iora, or black with a pair of bold white bars formed by the median coverts and the outer webs and tips of the secondary coverts, white extending to the sides of the tertials and inner secondaries in the Common Iora and broadly to their tips in Marshall's Iora. Females have only the flight-feathers black, and even then typically olive-washed to, in the Great Iora, never more than olive-grey. Their wingbars are narrower, and in female Green Ioras also yellow, and yellowish tips of the secondary coverts of some Great Ioras form an incipient bar. Other female coverts follow the green of the upper body, and the tail is always green.

The basic iora may otherwise be thought of as green above, from cap to tail, and, depending on species, green to greenish-yellow or yellow below, with yellow at the hidden bases of the mantle and neck feathers. Yellow on the face ranges from a narrow eye rim to a broader pattern on and around the eyelids. Tones of green vary geographically, least so in the Green Iora itself, most in the widespread Common Iora and, supposedly, Marshall's Iora. In both of the last two, they range from yellowish-green or lime-green, the extreme of which is seen in north-central India; through medium olive-green, which occurs widely in the Common Iora; to darkish grass-green, the extreme of which is found in southernmost India and Sri Lanka.

That fairly well defines juveniles and females. Across species, greens of males beyond the subadult stage vary geographically, from being more or less pure, to being washed chalky or dusted black, or a mixture of the two, as a result of fine dots at the tips of the outer barbs. Chalkiness is limited to green parts of the body plumage of Common and Marshall's Ioras in north-central India. Most of the rest of a complicated picture is due to melanin pigmentation, ranging from virtually none, through various strengths of dusting as dots expand along the barbs, to blocks of solid, slightly glossy black variably affecting the face, cap, upper body to upper-back level, and uppertail-coverts and tail. Among post-juvenile male Common and Great Ioras, this melanin deposition quite commonly switches on at the middle stage of the moult, producing parti-coloured tail feathers.

Other than in the Green Iora, some of this variation is also individual, and the appearance of Common and Marshall's Ioras, at least, is further affected by seasonal moults. The subspecies classifications of both Marien and Hall (see Systematics) succeeded only by taking the latter into account and by comparing, strictly, like stages with like. Individual variation blurs taxonomic boundaries, and it positively typifies a whole subspecies of the Common Iora, namely *horizoptera*, identified from south Myanmar and central Thailand south to Sumatra and its satellites, in which adult males vary from extensively black above to almost, but never quite, as "un-black" as females. Even more oddly, male blackness in this species is patchy on a geographical scale, with two subspecies in the Indian Subcontinent and, in South-east Asia, relatively unvarying black-capped and black-backed *deignani* and its southern neighbour *horizoptera* marooned among permanently green forms. This green "henniness" reaches an extreme in Java and Bali, where male Common Ioras of the subspecies *scapularis* fail even to acquire black uppertail-coverts and tail. Interestingly, sexual tail-length dimorphism in *scapularis* is less clear-cut than normal, making an investigation of its behavioural significance of special interest.

The biological connotation of individual male blackness versus greenness among Common and Great Ioras is unknown. In his 1877 essay, Hume speculated that enhanced blackness marked out "special vigor", but no-one has reported any social or productivity edge gained by blacker males over green ones; nor does degree of blackness seem to affect the brilliance of the golden-yellow throat and breast in breeding dress. Nowadays, vigour would be called "fitness", to be measured perhaps by survivorship, implying that blackness might develop or advance with age. Another nineteenth-century author, V. Legge, thought exactly that, on the basis that he believed Common Iora males in Sri Lanka to breed occasionally when in green plumage, but only because he had seen some around during the local nesting season. Male ioras do pass through a green subadult plumage stage, acquired by partial moult, but the question of whether blackness really does advance with age thereafter has never been answered.

Apart from permanently black or pied wings, uppertail-coverts and tail, full post-breeding moult reverts male Marshall's Ioras and male south and outer-tropical South-east Asian Common Ioras to a female-like appearance that may assist temporary relaxation of territoriality. Out of this have grown assumptions about what might be happening in the inner tropics, particularly of South-east Asia. Thus, at one extreme, there is a claim that male Common Ioras of the subspecies *horizoptera* show the same amount of seasonal change as do northern forms, and, at the other, the belief that in ever-wet equatorial environments no plumage alternation occurs at all. Neither of these conflicting ideas has been properly investigated, but neither can be wholly true. As black-morph *horizoptera* males never entirely vanish from, for example, the Malay Peninsula, the best interim guess is that supporters of the assertion that a full eclipse plumage occurs there have confused seasonal possibilities with the unique amount of permanent individual variation in this subspecies. The reverse claim implies either no differentiation of seasonal plumages or no actual prenuptial moult, yet males of *horizoptera* exhibiting a

In some races of the ***Common Iora****, notably those confined to islands, males are either relatively dull, or permanently hen-plumaged. The best example is provided by the form* scapularis *of Java and Bali, in which the males never develop black body plumage, and the sexes are virtually indistinguishable in all seasons. Reduced sexual dimorphism in island populations is a common tendency, by no means restricted to Aegithinidae, but nonetheless baffling, as are the marked geographical discrepancies in the plumage patterns and moult strategies of Common Ioras. These puzzles will perhaps best be solved by a study of upperpart colour, its seasonality, and its correlates, in different populations of males.*

[*Aegithina tiphia scapularis*, Kangassam, Bali. Photo: Tony Tilford]





Ioras spend most of their time amongst foliage, near the tips of branches, rarely feeding on the main branches themselves, and never on trunks. They are often seen peering under leaves or reaching out to pluck a prey item from a leaf or twig. Seeds or fruit may sometimes figure in the diet, but the available evidence suggests that ioras are essentially insectivores. This male ***Marshall's Iora*** *in non-breeding dress is probing acrobatically into a cluster of dead foliage at the tip of a tiny branch in the open* Acacia*-dominated woodlands of north-east India, no doubt rooting out a pupating insect of some sort. This foraging tactic is typical, but ioras also perform quick aerial sallies after flying prey.*

[*Aegithina nigrolutea*, north-east India. Photo: Göran Ekström]

conspicuously bright golden-yellow throat early in the breeding season are regular. The answer must, therefore, be that at least a bit of both occurs there, perhaps independently of individual variation. On the other hand, G. F. Mees, in 1996, found no sign at all of breeding colours in henny-plumaged Javan *scapularis*, nor could he confirm that it showed any prenuptial moult.

In sum, therefore, the greenness versus blackness, at least of the Common Iora, has no obvious connection with either climate or latitude. Perhaps colour divergence emerged randomly in formerly isolated population pockets that have since largely become reconnected.

Habitat

At family level, habitats occupied by aegithinids range from mangroves and pioneer strand woodland, including casuarina (*Casuarina equisetifolia*) stands, on accreting coastal dunes, inland across a full spectrum of broadleaf tree cover. These inland wooded areas range from stunted, arid-zone acacia (*Acacia*), mimosa (*Mimosa*) and saltbush (*Salvadora*) scrub, exclusive to Marshall's Iora, and from tree plantations, orchards and wooded parks and gardens, ultimately to deciduous woodland and the edge and canopy of semi-evergreen and fully evergreen rainforest, the latter inhabited by the Green and Great Ioras. Barring extremes of aridity and high evergreen-forest cover, the Common Iora spans the entire spectrum.

This is a lowland family, its South-east Asian forest-adapted members ranging onto submontane slopes, with the Great Iora perhaps confined to such slopes where it approaches the southern end of its range in Peninsular Malaysia, although nowhere known to reach the ecotone with montane forest. Common Ioras in the Indian Subcontinent, on the other hand, occasionally reach 2000 m or, in the eastern Himalayan foothills, slightly above this altitude. By virtue of preferred plant cover, north-central Indian populations of Marshall's Iora are plains-restricted, but this seems not to be true universally. Ways in which this species and the Common Iora interact ecologically elsewhere in the subcontinent are still undescribed.

Aegithinids are arboreal birds, living at tree-canopy level. Only exceptionally do they come to ground, and this appears as true of subdesert scrub-living populations of Marshall's Iora as it is of Green and Great Ioras in high forests of South-east Asia. In one observed incident, descent to the ground was accidental: two male Green Ioras locked in combat fell on to a forest track, where they were caught by hand.

General Habits

Regardless of habitat type, ioras rarely fly beyond the distance between neighbouring crowns. Their typical dispersion patterns, however, vary, and these do seem to be habitat-linked. In the Common and Marshall's Ioras, which are generally absent from closed-canopy forest, space is partitioned by territory-holding pairs the positions of which are advertised by loud vocalizations of the male. This is said to be relaxed in extreme seasonal parts of their ranges, including in northern India, where non-breeders join mixed-species foraging parties, and singing by both species is limited outside monsoon months. Elsewhere, the sight of more than two adults of these species in close proximity at any time is unusual, and the largest typical social unit consists of a parent and dependent offspring. The Green Iora, hardly emerging from closed, evergreen forest, is, by contrast, permanently or nearly permanently social, foraging throughout the year in parties that normally include several adults. Usually, these accompany mixed-species flocks, with some social cohesion implied by follow-my-leader flight behaviour. On the other hand, calling from within the flock is common and, just possibly, mated pairs join these gatherings independently. They are presumed to decamp in order to nest, but may still rejoin to forage, although the incident of the two males caught by hand, which returned to fighting after re-

lease (see Habitat), implied some form of territoriality, perhaps in defence of nest space.

Great Iora habitats overlap those of Green Ioras, but Great Ioras emerge more often into forest-edge vegetation, and towards the northern limit of the species' range, in north Vietnam, are described as entering groves and hedges. In Peninsular Malaysian evergreen forest this bird seems not to be social, although it occasionally joins mixed-species parties, but one such flock containing more than two adult Great Ioras is on record from neighbouring semi-evergreen forest. Otherwise, almost everything about the natural history of this bird is still rather mysterious.

The males, at least, of all iora species often spread the long, silky-white flank plumage over their lower back and rump apparently as some form of social signal during flight. These displays, better known for the Common Iora than for the other three species, range from normal-looking, horizontal flight to stiff-winged passes between two or more regular perches, and are conducted with the tail held depressed and the white of the flanks fully exposed. More certain courtship sequences, recorded for the Common and Marshall's Ioras, are described below (see Breeding).

Voice

So far as strictly vocal repertoires are concerned, most sounds made by ioras are strident, with a rasping or burring quality, and have a certain unmusical strangeness, all reasons why iora calls are so easily recognized and remembered. Above all, they are stereotyped. Despite the size of some individual repertoires, such as that of the male Common Iora, and in complete contrast to the leafbirds, with which aegithinids were formerly linked (see Systematics), iora songs ordinarily lack any cross-species mimicry. A claim by A. M. K. Bharos of a Common Iora mimicking an Ashy Drongo (*Dicrurus leucophaeus*) is the only one of its kind, although the reverse, mimicry of the iora by a drongo, is probably common.

Comparison of the repertoire ranges of the four members of the family is hampered by a shortage of information on the Great Iora. Nevertheless, it is noticeable how few loud, presumed distant advertising calls have been described for the Green Iora compared with Common or Marshall's Ioras. This difference is perhaps linked to these species' differing modes of dispersion, the Green Iora being strongly social and foraging in a group space, whereas the other two forage in more or less permanently partitioned pair spaces only (see General Habits).

The male Common Iora's courtship display from a perch (see Breeding) is preceded by a bout of long-calling. This call is a loud, monotone whistle, long drawn-out or broken into a series of short segments, with a sudden drop through approximately one octave to a further short plateau, and can be transcribed as "whee-ee-ee-ee-ee-ee-ee-ee-ee pyórr-rr-rr". Neighbouring males tend to respond to this advertisement with the same call. Interestingly, the vocal repertoire of Marshall's Iora appears to lack this long-call.

Ioras make external mechanical sounds, as well as vocal ones. The mechanical sounds of the Common Iora include a throbbing wingbeat, noticed particularly from males performing display flights. High-pitched frog-like or cricket-like sounds recorded from this species during the descent part of the "parachute" display (see Breeding) have been guessed to be mechanical, even though parachuting is also accompanied by a vocalization, which continues after the bird has landed.

Food and Feeding

"Seeds" have been reported in one or more stomachs of Common Ioras from Sarawak, in north-west Borneo, and C. W. Mason and H. Maxwell-Lefroy identified "remains of buds" in one of six stomachs from India. Furthermore, Robinson claimed that Common Ioras in the Malay Peninsula occasionally ate fruits and berries, especially those of mistletoes (Loranthaceae). No such behaviour has been corroborated in the field, however, and recent observers have assumed that the three smaller iora species, at least, are all fully insectivorous. These forage predominantly from leaves and twigs, rather than along branches; indeed, in R. A. Noske's observations in mangrove forests of the Malacca Straits, 100% of foraging attempts by Common Ioras were directed at leaves and twigs. Typically, all three forage at the outer edge of the crown, the Green Iora ascending to



*Our knowledge of the breeding behaviour of the **Green Iora** is, to say the least, incomplete. Only one confirmed nest has been reported, 8 m above ground level, and no detailed description is available. The nests of its relative, the Common Iora* (Aegithina tiphia)*, are often liberally enmeshed with cobwebs, which hold the structure together, and help to provide camouflage, especially when fragments of bark and lichen are incorporated into outer layers. On the basis of this photograph, it seems that similar nest-building behaviour extends to the Green Iora: it shows a busy female collecting a bundle of cobweb from the forest canopy.*

[*Aegithina viridissima viridissima*, Danum Valley, Borneo. Photo: Roland Seitre]



*As the **Common Iora** is such a common and familiar species over a broad geographical range, more is known about its nesting habits than for any other member of the family. It builds a neat cup-shaped structure with steep walls, anchoring it to twigs or branches using cobweb. Less often, the nest is placed directly on to the bark surface of a bough. The usual location is towards the outer tip of branches, or in saplings, most often 2–10 m above ground level. This photograph shows the contrast between the pale cobweb-felted exterior of the nest and the dark interior. Because they are adhesive, cobwebs are not used on parts of the nest which touch the incubating bird.*

[*Aegithina tiphia scapularis*, Bali.
Photo: Morten Strange]

the top of the forest canopy and regularly into the emergent crowns of giant trees.

The birds' actions on thin, pliable supports are often acrobatic. They involve much peering at the undersurface of leaves, and frequent reaching, which the proportionately long, straight bill must assist. The relatively large size of the bill, at least of the Common, Green and Great Ioras, also implies a capability of taking quite large prey, and the Common Iora is said to capture insects up to the size of, and including, large mantids. Various smaller insects, and also spiders (Araneae), feature in the diet, and those taken by the Green Iora include ones attracted to ripe fig (*Ficus*) crops in the forest canopy. Caterpillars are important to both of these species, and have also been mentioned as prominent in the diet of Marshall's Iora. Occasional flying insects, chiefly butterflies and moths (Lepidoptera), are taken in a short dash, but are always carried back to a perch to be processed.

Data on the Great Iora are lacking, but, as noted, over part of its range this species shares space with the Green Iora. The differences between these two in both bill size and total size suggest that diet and foraging behaviour may play a role in maintaining ecological distance between them.

Breeding

An undoubted courtship display of the Common Iora, given from a perch in the presence of a female, and after a bout of long-calling (see Voice), involves the male leaning forward, drooping his wings, spreading his tail and erecting the flank tufts. A second display by this species, and performed also by Marshall's Iora, is more energetic. In this, the perched male fans out the tail, tips the bill skywards and puffs out the rich yellow throat plumage, then shoots vertically upwards for a metre or more, erecting the body plumage, including that of the flanks, into a "feather ball", and executes a controlled "parachute" drop, descending directly or in a spiral to alight close to the perched female. It is possible that the spiralling descent is assisted by the spread tail. Once the male has landed, the perched display is resumed and the sequence repeated. While perched displays have been recorded widely, the parachute display, curiously, is described only from the Indian Subcontinent. Not a single report has been found from anywhere in South-east Asia, and this situation, if real, sits awkwardly with the explanation of sexual tail dimorphism mentioned above (see Morphological Aspects). Even within the ornithological literature of the Indian Subcontinent, it is difficult to judge where original description stops and copying-on begins. One radical possibility, yet to be followed up, is that the parachute display belongs to Marshall's Iora alone.

So far as the other two members of the family are concerned, the male Green Iora possesses all the expected special morphology, but its displays are unknown. The one reported instance of Great Iora display involved a puffed-up male launching itself forwards from a perch into a short, direct drop, without an initial vertical leap or a spiralling element. Evidently, all four species are in need of further, detailed attention.

In highly seasonal parts of the Indian Subcontinent, breeding by ioras is compressed into the summer wet period, principally June–July in the Indian state of Gujarat. In seasonal central Thailand, the Common Iora lays from March to June, this period in fact preceding the onset of wet weather. Its nesting seasons in less severely limiting parts of its global range are more prolonged. Thus, the Common Iora nests from December to September in southern India and Sri Lanka and during January–October in the Malay Peninsula, while in Java it breeds more or less throughout the year, although with a March–June peak of laying activity.

Three nests received by the oologist E. C. Stuart Baker, all from the West Malaysian state of Perak, constitute the sum of what has been reported of the breeding of the Great Iora. Stuart Baker described them as slightly larger than typical Common Iora nests, but accompanied by eggs that were an almost exact match for those of this significantly smaller species. He also stated that the nest trees, evidently small as all three nests were described as being situated below 2 m, had been colonized by aggressive tailor ants (*Oecophylla*), apparently without realizing





*The breeding cycle of the **Common Iora** is an egalitarian affair, and the same is probably true for all members of the family. It is possible that nest-building is the responsibility of the female alone, but both sexes contribute time to incubation, and to all other aspects of parental care. Adult males and females provision nestlings with food, brood them and shelter them from rain. Here a female is seen, first bringing a sizeable insect for her progeny, and then extracting a faecal sac for disposal away from the immediate surroundings of the nest. Clutch size in this species ranges from two to four eggs, with the lower figure being most common in tropical regions, and larger clutches being more frequent further north in the Indian Subcontinent. These photographs show a nest full to overflowing and it is difficult to imagine four chicks fitting in to such a construction. It takes an average of 14 days for the eggs to hatch, but the duration of the fledging period is unknown. For these particular chicks, the days of nest-ridden dependency are drawing to a close; judging by the advanced development of their flight-feathers, they will probably fledge within the next couple of days.*

[*Aegithina tiphia*, Karnataka, India. Above, photo: Vivek Sinha/ Oxford Scientific Films.

Below, photo: Vivek Sinha/ VIREO]



Forest clearance has been a benefit to half of the Aegithinidae family, and a bane to the other. The Common (Aegithina tiphia) *and Marshall's Ioras* (A. nigrolutea) *are species of relatively open habitats, and can thrive in scrubland, young regrowth and even in suburbia. Deforestation is their benefactor. The* ***Green Iora****, however, is restricted to tall lowland forest, adjacent mature secondary growth and relatively intact shade trees left standing over orchards and plantations, habitats whose extent has declined dramatically in the Sundaic region over recent decades. This species remains common on lower slopes and in fragments of native forest, but overall numbers must have plummeted. As with all forest birds in tropical Asia, a greater area of habitat needs to be brought under protection.*

[*Aegithina viridissima*, Panti forest, Johor, Malaysia.
Photo: Ong Kiem Sian]

that this fact would have placed the sites outside forest and taken them into the exclusive habitat of the Common Iora. In short, Stuart Baker is likely to have been misled, and the real nest of the Great Iora remains to be discovered.

Smaller iora species all build neat, steep-walled, open cup-nests, heavily felted externally, and anchored to twig and branch forks, or directly on to the bark surface of a bough, with cob-web silk. The latter's greyish colour camouflages the structure, making the nests hard to spot against the wood substrate, and some Common Ioras complete the disguise by incorporating bark fragments. The nests of Common and Marshall's Ioras are comparatively well known, whereas details of the Green Iora's nest again depend on material sent to Stuart Baker, backed by a few more recent, distant views. In its scrub habitat, Marshall's Iora often builds its nests as low as one metre from the ground, while most Common Iora nests are much higher up, to 10 m. A height above ground of 8 m is the only such statistic obtained for a Green Iora nest, and it is not yet known if this aegithinid is among those canopy-living bird species that, for breeding purposes, transfer to the more equable micro-climate of the shade layers of the forest.

The only aegithinid eggs that have been described reliably are those of the Common and Marshall's Ioras. These are variably broad to longish ovate in shape, with slight to no gloss. The ground colour is pale cream to grey-tinged or, sometimes, pinkish in the case of the Common Iora, and white to pinkish in Marshall's Iora. The eggs of both are streaked purplish-grey and light brown to reddish-brown over, or in a zone around, the broad end, but not more than stippled elsewhere; and some eggs of Marshall's Iora have only the stippling. A sample of 60 eggs of the Common Iora had dimensions of 16·2–19 × 13·2–15 mm, and 20 of Marshall's Iora measured 17–18 × 12·6–13·5 mm. Two reputed Malaysian eggs of a Green Iora clutch, dated 25th May, measured 18 × 14 mm and 17·6 × 13·8 mm, respectively, hence no different in size from those of the Common Iora.

The clutch size of the Common Iora ranges from two eggs in inner-tropical South-east Asia to two to four in Myanmar, and two or, more often, three and occasionally four in the Indian Subcontinent. In north-central India, Marshall's Iora likewise lays two or three eggs, but occasionally lays four. Pair-members share incubation duties, and the incubation period of the Common Iora lasts for an average of 14 days. There is no exact information available on the duration of the fledging period of either this or Marshall's Iora, but both parents, of both species, tend the nestlings and fledglings, sheltering and brooding them by erecting the long body plumage into a fluffy ball. The observation in a Malaysian garden of a fledgling Common Iora being tended constantly by one particular parent hints at a partitioning of parental responsibilities, but more observations are needed in order to confirm this.

Apart from the single two-egg clutch referred to above, all that is known about the breeding biology of the Green Iora is that both pair-members tend the nestlings, and both brood during rain, fluffing themselves out into a ball in the manner of other iora species.

The Common Iora is a major brood host of the Banded Bay Cuckoo (*Cacomantis sonneratii*). The global ranges of the two are more or less coterminous, but the cuckoo's habitat range is broader, taking in evergreen forest. Possible alternative hosts in South-east Asian forests are thought to include the Green Iora, but this has yet to be confirmed. A Green Iora pair was also seen to chase away an Asian Drongo-cuckoo (*Surniculus lugubris*), but reaction to *Cacomantis*-sized cuckoos may be generic, and aggressive behaviour alone is no confirmation of an actual host-parasite relationship.

Movements

Only at the extreme western, semi-desert fringe of the family's range, on the Kathiawar Peninsula, in west India, has any im-

pression been gained of ioras being other than sedentary. In a highly seasonal environment there, R. S. Dharmakumarsinhji suggested that Marshall's Iora and at least some Common Ioras behaved as migrants, perhaps on a local scale, the latter arriving in April and May, breeding during the rains of the south-west monsoon, and then departing in October. About a decade earlier, however, Ali, working in a part of the same area, had treated Marshall's Iora as a resident and made no mention of the Common Iora as occurring there at all. No later reference covering this region has even raised the issue of migration. From that it is inferred that silent individuals in eclipse plumages (see Morphological Aspects) may have been overlooked.

Relationship with Man

Whereas the Green and Great Ioras are largely confined to forest habitats, the other two members of the family enter orchards and fruit groves from time to time. Indeed, one of the Tamil names for the Common Iora means "little mango bird". Neither of these latter two species is, however, in any way a pest and, even though they may take some injurious insects, they make no obvious mark on crops one way or the other. Man's relationship with these birds, apart from having an impact on their ecology and conservation, is purely aesthetic.

Breeding-season males of Common and Marshall's Ioras are brightly plumaged birds the loud, stereotyped songs and other calls of which are, to many people, redolent of generally familiar surroundings. Writing of the Common Iora in the hot plains of central Myanmar, E. Stresemann and G. Heinrich recalled its strange sounds: "he who hears this monotonous call from bush and tree along the long, dry, blazing roads, will never forget it all his life and it will remain in his memory forever associated with these arid spaces". Wherever this bird occurs, the effect on those attuned to wild sounds is the same; indeed, names for Common and Marshall's Ioras in several languages of the subcontinent are more or less onomatopoeic of calls that the two have in common. With a small stretch of the imagination this could even be true of the word "iora" itself, and also of the Indonesian *cipoh* (pronounced as "chipoh"), shorthand for the Common Iora's long-call with abrupt pitch drop (see Voice).

On the other hand, nowhere in the range of the family does there seem to be a tradition of keeping ioras as cagebirds, and not a single reference to ioras in captivity emerged in a search of over 20 years' worth of the main western avicultural literature. Perhaps aegithinids are too difficult to maintain, as wild birds living close to people are often unusually nervous; or maybe their songs are too monotonous or melancholy. Suffice it to point out that over a three-year period in the late 1960s, during a weekly survey of one of the larger public wildlife markets of the region, the Bangkok city "Sunday Market", H. E. McClure and S. Chaiyaphun found only 43 individual ioras, all Common Ioras, as opposed to some 4000 other "aegithinids", which in those days were taken to include leafbirds and fairy-bluebirds (see Systematics). Whatever it is that has kept the Common Iora out of cages is perhaps a reason why this species is still common in such close proximity to people.

Status and Conservation

Where suitable habitat remains, Common and Green Ioras tend to be fairly numerous. The vernacular name has been applied just to the former perhaps because of its larger range but, more likely, simply because of this bird's familiarity around human habitation, where it uses vegetation strictly marginal to other species' needs. In the 1940s, Ali found Marshall's Iora to be "common and generally distributed" in the Kachchh district of Gujarat, on the western side of this species' "core" north-central Indian range. Degradation of the woody cover of this arid region over time is bound to have had some impact, but none of the more recent literature suggests that any fundamental change of status has occurred in this area. Outside its core range, this iora is known from just a handful of records, but these are not an acceptable measure of true rarity as, away from this zone of expected occurrence, the bird would not have been looked for and is strongly likely to have been passed over. A more objective picture should emerge as observers realize the geographical possibilities and learn to separate the songs of Marshall's and Common Ioras as a matter of course. To this end, the recent publication by Rasmussen and Anderton, in 2005, should be of great assistance.

Of the four members of the family, only the Great Iora has rather widely been described as uncommon to actually rare, as, for instance, by A. David-Beaulieu in 1944 and B. E. Smythies in 1953. Some of this assessment, however, may have to do with the species' preferred high-canopy foraging habitat, as well as to poor knowledge of its vocalizations. In 1991, B. Lekagul and P. D. Round described the Great Iora as common in Thailand, and the present author found it so in logged but recovering semi-evergreen forest on the Thailand-Malaysia border. The latter observations included two or more individuals, with some Green Ioras, in a mixed-species foraging party, but farther south in Peninsular Malaysia, in mature submontane evergreen forest, McClure identified the Great Iora in less than 10% of the canopy-level flocks that he censused in the 1960s.

Progressive clearance of woodland for agriculture and fuel in the Indian Subcontinent cannot have failed to have an impact on the numbers of Common and Marshall's Ioras, but nowhere has it been suggested that any part of their regional distribution is under real threat. Where climax vegetation inland shifts to closed-canopy forest, as indicated, human activity is likely to have benefited Common Ioras, and on a large scale; indeed, it may even have promoted some secondary contacts. Except where their living space has been exposed to excessive fogging with insecticides, of which malathion and other such organophosphorus compounds are favourites, the Common Iora does well even in suburbia, and is a familiar sight in, for example, the planted parklands of Singapore city.

What seems to have benefited the Common Iora has had the opposite impact on the Green and Great Ioras, and will continue to do so. Both of these species are more or less tied to semi-evergreen or fully evergreen forests of South-east Asia, inland of mangroves, below the ecotone with montane forest, and mostly to mature or fairly well-regenerated growth. Over the twentieth century, and with great acceleration in recent decades, a huge part of their original living space was lost to total clearance. At least within the Sunda region, both species make use of submontane slopes, which is where most or all relict lowland forest will remain in the future. Over its main continental range north of the Malaysian forest zone, however, the core habitat of the Great Iora is suspected to have been plains-level or bottomland forest; this is now a rare habitat, excessively fragmented, and over long distances vanished, including in the aforementioned area on the Thailand-Malaysia border. The Great Iora is representative of hundreds of forest bird species through South-east Asia of which current numbers and total spread are no measure even of medium-term security. The latest BirdLife International Red Data Book on Asian birds, edited by N. J. Collar and colleagues and published in 2001, excludes aegithinids from any of its threatened categories; yet, for the Great Iora and probably the Green Iora, a 10% chance of extinction within the next 100 years, which is one of the IUCN's descriptors of Vulnerable status, seems quite a modest prediction. In *Threatened Birds of the World*, published one year earlier, the Green Iora was given the global conservation status of Near-threatened, whereas the Great Iora, somewhat surprisingly perhaps, was not listed at all.

General Bibliography

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PLATE 29

inches 3
cm 8

Genus *AEGITHINA* Vieillot, 1816

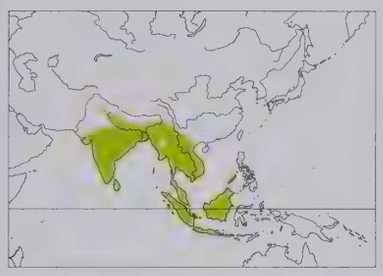
1. Common Iora

Aegithina tiphia

French: Petit Iora **German**: Schwarzflügeliora **Spanish**: Iora Común
Other common names: Indian Iora, Black-winged/Small Iora; Ceylon Iora (*multicolor*)

Taxonomy. *Motacilla Tiphia* Linnaeus, 1758, vicinity of Calcutta, West Bengal, India.
Has often been treated as conspecific with *A. nigrolutea*, but differs in e.g. details of morphology, plumage and vocalizations. Delineation of races complicated by individual variation in amount of black on cap and upper body of males, intercalation of a male eclipse plumage of varying distinctness from breeding dress, some broad geographical intergradation zones (especially in Indian Subcontinent), and inter-population convergence (including of colour tones of eclipse plumages). Proposed races *singapurensis* and *micromelaena* of Malay Peninsula and islands absorbed within range of variation of *horizoptera*; races *trudiae* (from Brunei Bay, in N Borneo) and *djunkulanensis* (extreme W Java) treated as local intergrades between larger neighbouring entities. Eleven subspecies recognized.

Subspecies and Distribution.
A. t. septentrionalis Koelz, 1939 – foot of NW Himalayas in N India (Punjab, Himachal Pradesh).
A. t. tiphia (Linnaeus, 1758) – foot of Himalayas from N India (E from Punjab) E to Bangladesh, and adjacent W Myanmar.
A. t. humei Stuart Baker, 1922 – C Indian Subcontinent (E from Rajasthan).
A. t. multicolor (J. F. Gmelin, 1789) – extreme S India and Sri Lanka.
A. t. philipi Oustalet, 1885 – SC China (Yunnan), E Myanmar, N & C Thailand and N & C Indochina.
A. t. deignani B. P. Hall, 1957 – Myanmar (except W, E & S).
A. t. horizoptera Oberholser, 1912 – S Myanmar and C Thailand S to Malay Peninsula, and Sumatra and satellites (Nias I, Riau and Lingga Archipelagos, Bangka).
A. t. cambodiana B. P. Hall, 1957 – SE Thailand and S Indochina.
A. t. aequanimis Bangs, 1922 – W Philippines (Palawan) and N Borneo (Sabah), and satellite islands.
A. t. viridis (Bonaparte, 1850) – Borneo (except N).
A. t. scapularis (Horsfield, 1821) – Java and Bali.
Descriptive notes. 12·5–13·5 cm; male 13–17 g, female 12–15 g (*humei*). Male nominate race breeding plumage (acquired by partial spring moult) has upperparts mostly green, crown green with some black dusting, forehead, lores, face and underparts yellow (richest on throat and breast); uppertail-coverts and tail black; wings black, median upperwing-coverts and tips of greater coverts white (forming two conspicuous bars), sides of tertials and inner secondaries white; iris whitish; bill light grey-blue with blackish culmen ridge; feet slaty grey. Differs from very similar *A. nigrolutea*



mainly in having no white in tail, less white in wings. Male post-breeding eclipse plumage resembles female, but wings, uppertail-coverts and tail remain black. Female is duller, with green to no more than black-dusted green uppertail-coverts and tail, underparts often green-washed and without rich golden tone on throat. Juvenile and subadult are like female. Races vary mainly in tone of greens, development of yellow collar, and extent of black on male upperparts (following details refer to breeding-plumaged males unless otherwise specified): *septentrionalis* is like nominate, but slightly larger, upperparts slightly paler green, bill longer and deeper; *humei* has black cap and mantle, variable black-fringed bright yellow hindcollar (confluent with yellow of underparts), chalky-washed lime-green lower back and rump, eclipse plumage female-like with upperparts the same lime-green; *multicolor* is like previous, but no yellow hindcollar, black on body usually more extensive, rump (only) much darker, more grass-green, white bar on greater wing-coverts sometimes missing; *deignani* has black cap and mantle, usually only trace of yellow hindcollar, and lower back and rump grey-green; *philipi* resembles nominate but upperparts darker green, sometimes with black flecks; *cambodiana* differs from last in having little or no yellow on forehead and lores, green upperpart still darker, blacker-washed, cap occasionally solidly black; *horizoptera* is mainly yellow-tinged green above, black confined mostly to rear cap (variable, sometimes extending to whole cap and mantle), extent of seasonal differentiation uncertain but eclipse plumage at least lacks golden colour of throat and breast; *aequanimis* is black-washed yellowish-green above, forehead and lores pure yellow; *viridis* is like previous but smaller, lacks yellow on forehead; *scapularis* is clear yellowish-green above, including uppertail-coverts and tail, lacks golden wash on throat and breast, shows no seasonal change. VOICE. Female repertoire poorly documented. Territorial males noisy, vocally interactive, with range of strident, unmusical rasping, whistling and whining songs, loud but often rather melancholy, including: with glissading component, "di-di-dweeo" or "piyou" or "peeou", or "weet-we-to", in bouts; repeated "dweeo dweeo dweeo", or "tyior tréé-tyiór" (rendered as "oh, here we are"); couplets, "di-wee di-wee" or "dee-du wee-du"; coarse "r'yeek r'yeek r'yeek", then a pause, then mellower "pleeu pleeu pleeu"; "whip-wéé-bird-éé" or similar but trisyllabic "if you-PLEASE", about once per second, with frequently intercalated "please-me?"; long, slow bouts of "my…dáddy"; querulous "chee-wheee che-wheee che-wheee"; also "chee-chit-chit-chit-chit-chit" like that of tailorbird (*Orthotomus*), and sharp chirp while following a female. Described from most parts of range is a loud, long-drawn-out, monotone whistle and sudden drop through approximately one octave to a further short plateau, "whee-ee-ee-ee-ee-ee-ee-ee-ee pyórr-rr-rr", or the whistle is broken into a string of short segments; neighbouring males tend to respond to this advertisement with the same call. Parachuting display-flight said to be accompanied by shrill "pwee-pwee-pwee-pwee-pwee-pwee", reminiscent of a common call of Large Woodshrike (*Tephrodornis gularis*). Race *humei* said to have sweeter-toned songs than nominate, but confusion with songs of potentially co-occurring *A. nigrolutea* cannot be discounted.

Habitat. Mangroves are about the only natural closed-canopy evergreen forest inhabited permanently. Otherwise, found in pioneer coastal scrub and strand woodland, including casuarina (*Casuarina*) stands, also forest edge and light and broken woodland inland, and groves, bamboo thickets, orchards, plantations and scattered tall tree cover in agricultural and other disturbed sites; extends to rural settlements and wooded parks and gardens of suburbia, thus in regular association with humans. Said to prefer deciduous to evergreen vegetation in Indian Subcontinent, and to be commoner in drier zones in Sri Lanka. Lowlands over most of range, but in typical habitats in Indian Subcontinent occasionally to above 2000 m; in SE Asia, unrecorded above c. 800 m, i.e. well short of ecotone with regional montane habitat.

Food and Feeding. Insects and other arthropods; rumoured to take small fruits, but this unconfirmed. Prey items range up to size of large mantids; otherwise include spiders (Araneae), ants (Hymenoptera), beetles (Coleoptera), caterpillars and occasional adult lepidopterans. Loners and, commonly, pairs forage among twigs and foliage at crown level, preferring taller trees, moving often acrobatically to peer beneath leaves; occasionally, birds also dart out to snatch closely passing flying prey. In strongly seasonal environments, non-breeders frequently join mixed-species foraging parties at forest edge; occasionally with other iora species in such parties. Otherwise, groups of more than two individuals foraging together exceptional (and slight evidence from Malaysia that, for rearing purposes, fledged broods are split between parents).

Breeding. Season Dec/Jan–Sept in Indian Subcontinent, but more tightly constrained to monsoon rain (to which said to react fast) in more strongly seasonal areas; egg-laying Mar–Jun in C Thailand and Jan to early Oct in Malay Peninsula; apparently breeds in all months, but peak during Mar–Jun, in Java. Nest 1–10 m up (rarely below 2 m) in branch fork or directly on bark surface of a bough, a thick-walled, steep-sided open cup, neatly built from tree cotton, fine grass, tendrils, fibre, etc., lined with fine fibre, comprehensively felted with cobweb (locally, felting incorporates bark fragments) and also anchored to support with cobweb, so that most are difficult to distinguish from a greyish, lichen-covered woody knob; wide range of trees used, but race *humei* said to favour *Mangifera*, *Zizyphus*, *Citrus* and *Bauhinia*, also thorny acacias (including *Acacia senegal* and *A. leucophloea*). Clutch 2 eggs generally, in Indian Subcontinent often 3 (exceptionally, 4), those at least of small clutches laid up to 48 hours apart; incubation from first egg, by both sexes, only female at night, male taking slightly larger share of daytime duties, incubation period 14 days; reports of breeding male singing close to an active nest and, remarkably, while sitting on it; no reliable information on fledging period; both parents tend nestlings and fledglings. An important brood host of Banded Bay Cuckoo (*Cacomantis sonneratii*) in most of range.

Movements. Resident. Apparently local seasonal movements have been alleged to occur in W India (Kathiawar Peninsula, in Gujarat), but other observers failed to detect this behaviour there, and no such movements reported anywhere else. Said to overwinter to upper altitudinal limit of its range in Himalayan foothills.

Status and Conservation. Not globally threatened. Common more or less throughout range. Thrives even in suburbia; is a familiar sight in e.g. the planted parklands of Singapore city. No more than local threats from habitat loss or, in suburban sites, damage to food resources from pesticides. Occurs in many national parks and other protected areas through much of range.

Bibliography. Abdulali (1981), Ali (1969, 1996), Ali & Ripley (1996), Bharos (1998), Deignan (1945), Dharmakumarsinhji (1954), Dickinson *et al.* (1991), Étchécopar & Hüe (1983), Eve & Guigue (1996), Fleming *et al.* (1984), Glenister (1971), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Hall (1957), Harrison (1999), Henry (1998a), Herbert (1923–1926), Inskipp *et al.* (1999), Jeyarajasingam & Pearson (1999), Khacher (1997), Lamsfuss (1998), Legge (1983), MacKinnon & Phillipps (1993, 2000), Madoc (1976), Mahabal & Lamba (1987), Majumdar *et al.* (1992), Marien (1952), van Marle & Voous (1988), Mason & Lefroy (1912), McClure (1998), Medway & Wells (1976), Mees (1996), Meyer de Schauensee & Ripley (1940), Mukherjee (1995), Nash & Nash (1988), Noske (1995), Phillips (1978), Rasmussen & Anderton (2005), Riley (1938), Ripley (1982), Saha & Dasgupta (1992), Smith (1943), Smythies (1986, 1999), Spennemann (1934), Spittle (1952), Stepanyan (1995), Strange (2002), Stresemann & Heinrich (1939), Stuart Baker (1922–1930, 1932), Thompson (1966), Tooth (1901a), Watt (1925), Wells (2005), Wesley (1984), Whistler (1944, 1949), Whistler & Kinnear (1932).

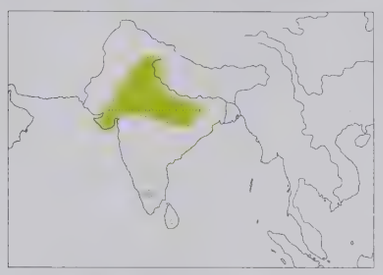
2. Marshall's Iora

Aegithina nigrolutea

French: Iora à queue blanche **German**: Schwarzkappeniora **Spanish**: Iora Coliblanca
Other common names: White-tailed Iora

Taxonomy. *Iora nigrolutea* G. F. L. Marshall, 1876, Meerut, north-west Uttar Pradesh, India.
Has often been treated as conspecific with *A. tiphia*, but differs in details of morphology, plumage and vocalizations, amongst others. Birds from NW India (Gujarat) described as race *sulphurea*, but now considered indistinguishable from adjacent populations. Elsewhere in range, some of the size and tonal variation apparent may eventually be recognized taxonomically. Currently treated as monotypic.

Distribution. India, in N from Himachal Pradesh S to Gujarat (S to Kathiawar Peninsula), Uttar Pradesh and N Madhya Pradesh, E sporadically (or overlooked) as far as Bihar and Orissa, and in S in NC Tamil Nadu; also Sri Lanka.



Descriptive notes. 12–12·8 cm; male 11–14 g, female 10–14 g (N India); on present evidence, smaller in S India and Sri Lanka. Male breeding plumage (acquired by partial spring moult) described only from N India: face, underparts and broad collar rich yellow, collar with small amount of black fringing; cap and upper body except rump solidly black, rump chalky green; tail black with bold white tipping, lateral feathers white along web margins; wings black, median upperwing-coverts and tips of greater coverts white (forming two conspicuous bars), tertials and inner secondaries broadly edged white, tertials also broadly tipped white (white tips wear off); iris brown; bill light grey-blue with blackish culmen ridge; feet slaty grey. Differs from very similar *A. tiphia* mainly in having white in tail, more white in wings. Male post-breeding eclipse plumage (in N India) resembles female, but wings and tail black, some black smudging on nape. Female is entirely chalky-washed green above (tone apparently darkening from N to S), tail centre silvery grey, black on wings restricted, underparts paler, more greenish-yellow, than male. Juvenile resembles female; adult tail colours assumed at post-juvenile moult. VOICE. In NW India (Kachchh district of Gujarat), song coincides with SW monsoon rainy season, and uncommon before Jun; comprises many upslurred or downslurred notes, includes "tchoo-tchoo" disyllable followed by loud, metallic "chee-tchoo-tchoo-tchee" or "chee-chó-chi-choo". Calls are of 2–4 syllables, rendered as "wheeti wheeti" or "twsee-ku-kee" or "tswee-twsee-tee-dik", also rarer variations as "ee-teh-wee-hu" and "chef-worrilee", or accelerating "jéez-whéez-zee-zee…" ("jeez" note single or doubled) like that of a tit (Paridae). Lacks long-call with octave drop of male *A. tiphia*.

Habitat. Exclusively at plains level in N of range, where favours thorny acacia (*Acacia*) jungle, and scrubby groves and gulleys; around Delhi, reported also as frequenting canopy of *Dalbergia sissoo* (sheesham) woodland. Habitat in S insufficiently described, but includes open, park-like woodland at up to 700 m.

Food and Feeding. Diet arthropods, including insect imagines and larvae. Hunts alone or in pairs, but joins mixed foraging parties after breeding season. Forages among outer twigs and crown foliage, often acrobatically to assist leaf-scanning.

Breeding. Data only from NW India (Gujarat). Lays mainly in Jun and Jul. Nest, built by both pair-members, a small, very neat cup made of fibre and grass, lined sparsely with hair, felted externally with cobweb, placed in fork of *Salvadora* bush or directly on to bark surface of mimosa (*Mimosa*) or fig (*Ficus*) bough, often less than 3 m and down to 1 m from ground. Clutch 2–3 eggs, exceptionally 4; incubation by both sexes, and both also tend young, including either swallowing faecal sacs or dropping them at a distance from nest; no information on incubation and fledging periods.

Movements. Resident. Said to move seasonally in parts of NW India (Gujarat), but facts not established and described by others as present throughout year in that area.

Status and Conservation. Not globally threatened. Locally common in N India; status elsewhere uncertain, but probably more common than suggested by records. In 1940s, was reported as common and widely distributed in Kachchh district of Gujarat, on W side of its "core" range; degradation of woody cover of this arid region presumed to have had some impact, but no evidence that any fundamental change of status has occurred in that area. Outside core range, known from just a handful of records, but thought strongly likely to have been passed over as *A. tiphia*. Occurs in Keoladeo Ghana National Park, in N India (E Rajasthan).

Bibliography. Ali (1945, 1996), Ali & Ripley (1996), Dharmakumarsinhji (1954), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998), Hall (1957), Hume (1877a), Hutson (1954), Inskipp *et al.* (1996), Kazmierczak (2000), Lester (1897), Marien (1952), Mukherjee (1995), Rasmussen & Anderton (2005), Ripley (1982), Stuart Baker (1932), Whistler (1949), Whistler & Kinnear (1932).

3. Green Iora

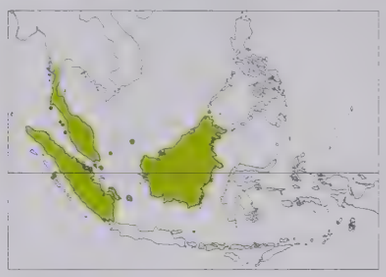
Aegithina viridissima

French: Iora émeraude **German**: Smaragdiora **Spanish**: Iora Verde

Taxonomy. *Iora viridissima* Bonaparte, 1850, Sumatra.
Population of Batu Is (off W Sumatra) named as race *nesiotis*, but considered inseparable from nominate. Taxonomic status of N Natuna Is (S China Sea) population yet to be resolved; currently included in nominate, but further study needed. Two subspecies recognized.

On following page: 4. Great Iora (*Aegithina lafresnayei*).

Subspecies and Distribution.
A. v. viridissima (Bonaparte, 1850) – extreme S Myanmar (S Tenasserim) and SW Thailand S to Malay Peninsula, Sumatra and satellites, N Natuna Is and Borneo.
A. v. thapsina Oberholser, 1917 – Siantan I (possibly also other islands), in Anamba Group (E of Peninsular Malaysia).



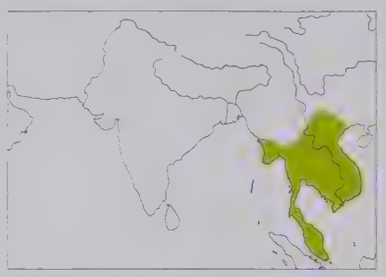
Descriptive notes. 11·5–12·8 cm; one immature 13·8 g. Male is mostly dark olive-green, lightening to pale yellow at rear edge of rump, clear yellow on carpus edge and central belly to undertail-coverts, whitish on rear flanks, "thigh" feathers green-tipped black; anterior face black, upper and lower eyelids broadly and contrastingly bright yellow; wings black, tips of median coverts and tips of outer webs of greater coverts white (forming two bars); uppertail-coverts and tail black; iris dark brown to red-brown; bill pale grey-blue with blackish culmen ridge; feet slaty-grey. Female has lores and full eyering yellow, rest of face and upperparts uniform medium olive-green, uppertail-coverts and tail green, wings as male but black parts washed dark olive, lesser coverts green, wingbars yellow; underparts paler-toned than above, yellowing from centre of belly, thighs yellow. Juvenile is like female; some males have parti-coloured tail, implying existence of a subadult plumage. Race *thapsina* differs from nominate principally in more generally yellowish underparts of female. Voice. Song a high-pitched, lisping "itsu-tsi-tu tsi-tu", or (described in Borneo) an even-pitched staccato sequence with upslurred first note, "wi-it dit-dit-dit-dee-dee". Commonest loud call a whining, nasal disyllable with marked tonal step, "ji-sheur" or "ji-wier"; courting male gave higher-pitched "ji-jirijiri-jeh". Repertoire limited in comparison with *A. tiphia* and *A. nigrolutea*.
Habitat. Canopy, including giant emergent crowns, of lowland evergreen rainforest, also of its peatswamp-forest and white-sand pole-forest variants; locally, also tall secondary forest and overgrown tree plantations of rubber and *Albizzia*, also *Trema orientalis* shade over cocoa. Ranges into mangrove forest on Langkawi I, off NW Peninsular Malaysia. At plains level and on submontane slopes, to upper limit of c. 820 m.
Food and Feeding. Invertebrates, including record of large caterpillar eaten; fledged young were fed on caterpillars. Food items taken from foliage and inflorescences; also attracted to insects gathered at canopy-level crops of figs (*Ficus*). Regular foraging units are a pair or a small party. Groups routinely join mixed-species foraging flocks of canopy insectivores; in Selangor (Peninsular Malaysia), was the second most frequent participating species among flocks surveyed in submontane Gombak Valley, with mean rate of 2·8 individuals per flock attended.
Breeding. Poorly known. Incubation and nestlings recorded in mid-Apr and early May, and nest-building in mid-May. One nest described as a small, neat cup of fibre and fine grass, lined with fine grass, felted with cobweb externally and on to vertical fork of small tree in forest gap, but on this information not distinguished from that of *A. tiphia*, and identification (and site) have been questioned; more recently, a nest located 8 m above ground in forest-edge tree. Clutch probably 2 eggs; no information on incubation and fledging periods; both pair-members tend nestlings, both also brood during rain. Suspected brood host of Banded Bay Cuckoo (*Cacomantis sonneratii*) in forest, but still unproven; apparent pair mobbed an Asian Drongo-cuckoo (*Surniculus lugubris*).
Movements. Resident.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Common in areas where forest canopy continuous. Formerly more widespread, but huge amounts of range now unsuitable owing to habitat removal; habitat loss greatly accelerated during last decades of 20th century. Little of what remains is still untouched, and stability of this species' presence in plantations is unknown. Nominate race occurs in several protected areas, including Khao Pra-Bang Khram Wildlife Sanctuary, in Thailand, Taman Negara National Park, in Peninsular Malaysia, Way Kambas National Park, in Sumatra, and Danum Valley Conservation Area, in Borneo. Race *thapsina* has very small range, known to occur only on Siantan I, in Anamba Group, but possibly present also on other islands in that archipelago; reported presence on neighbouring Bunguran I (N Natunas) unconfirmed.
Bibliography. Anon. (1999a, 2001b, 2002b), Collar *et al.* (2001), Jeyarajasingam & Pearson (1999), Lamont (1997), MacKinnon & Phillipps (1993), Madoc (1976), van Marle & Voous (1988), McClure (1966, 1967, 1998), Medway & Wells (1976), Nash & Nash (1988), Riley (1938), Sheldon *et al.* (2001), Smythies (1986, 1999), Stattersfield & Capper (2000), Strange (2002), Stuart Baker (1922–1930, 1932), Thompson (1966), Wells (1985c, 2005).

4. Great Iora

Aegithina lafresnayei

French: Iora de Lafresnaye **German**: Großiora **Spanish**: Iora Grande

Taxonomy. *Iora Lafresnayei* Hartlaub, 1844, Melaka, Peninsular Malaysia.
Race *innotata* intergrades with nominate in Malay Peninsula. Three subspecies recognized.
Subspecies and Distribution.
A. l. innotata (Blyth, 1847) – S Myanmar and S China (S Yunnan) S to N Malay Peninsula, S Laos and C Vietnam.
A. l. lafresnayei (Hartlaub, 1844) – extreme S Thailand and Peninsular Malaysia (S to S hills of Johor).
A. l. xanthotis (Sharpe, 1882) – Cambodia and S Vietnam.



Descriptive notes. 13·6–15·4 cm. Male nominate race has anterior face and entire underparts bright yellow; forehead yellow, forecrown black-fringed yellow; rest of crown, ear-coverts, nape and upperparts solidly (slightly glossy) black, or dark olive with broad black tips; wings and tail solidly black; iris grey-white or dark brown (possible sexual difference, not yet clarified); bill pale grey-blue with slaty-black culmen ridge; feet blue-grey. Female has lores and narrow eyering pale yellow, crown, upperparts, wing-coverts and tail olive-green, flight-feathers sooty grey, underparts pale yellow, breast side and flanks suffused green. Juvenile resembles female, but has pale fringing on uppertail-coverts, duller underparts; apparent juvenile male with parti-coloured tail suggests existence of subadult plumage, but this tail pattern occurs also among some adults of supposed intergrades between nominate and *innotata*. Races differ mainly in upperpart coloration: *innotata* is darkish olive-green above, including tail, variably dusted black, with flight-feathers mainly sooty black, tertials sooty olive (female wing all green); *xanthotis* has lores, narrow eyering and short spur behind eye yellow, and cap, upperparts, wings and tail clear lime-green, tail feathers with yellow tips, female duller with olive flanks. Voice. Rapid, high-pitched "chiu-chiu-chiu..." or "chew-chew-chew..."; in Peninsular Malaysia, "pretty song, quite different from *tiphia*" in extreme NW (Perlis), also 4-note whistle and churrs in S (Johor); loud whistling, richer and more powerful than that of *A. tiphia*, described from Myanmar (Tenasserim).
Habitat. Edge and canopy of semi-deciduous to evergreen lowland forest, including crowns of giant emergent trees; said also to enter tall secondary growth and occasionally overgrown plantations (of durian, rubber, etc.). In Malay Peninsula, apparently confined to submontane habitat in S, whereas perhaps mainly at plains level farther N. In N Vietnam, towards N limit of range, found by one observer in 1940s only in lowlands, in forest dominated by bamboo and with dense undergrowth, also in hedges and groves of otherwise more or less cleared country, including around villages.
Food and Feeding. No information on diet and foraging methods. Joins mixed-species foraging parties of insectivores.
Breeding. No confirmed description. Nests collected in early 20th century in Perak (Peninsular Malaysia), reported as of this species, suspected of having belonged to *A. tiphia*.
Movements. Resident.
Status and Conservation. Not globally threatened. Generally uncommon to only locally common; sparse in far S of range. Claimed from coastal strand-woodland casuarinas (*Casuarina*) in SE Sumatra, but evidence is equivocal and habitat atypical; corroborative observations required. As it is more or less tied to inland forests below the ecotone with montane forest, a huge part of the species' original living space was lost to clearance during 20th century, with rate of loss accelerated in recent decades. N of Malay Peninsula, core habitat suspected to have been plains-level or bottomland forest, most of which has disappeared, and remainder now excessively fragmented. Occurs in several protected areas, including Kaeng Krachan National Park, in Thailand, Taman Negara National Park, in Peninsular Malaysia, and Nam Bai Cat Tien National Park, in Vietnam. Although not currently listed as threatened, it seems reasonable to suggest that it may already be Near-threatened.
Bibliography. Anon. (1997c), Baker (1932), David-Beaulieu (1944), Deignan (1945), Eames & Ericson (1996), Hume & Davison (1878), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (2000), McClure (1967), Medway & Wells (1976), Silvius *et al.* (1986), Smythies (1986), Stepanyan (1995), Wells (1985c, 2005).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family PTILOGONATIDAE (SILKY-FLYCATCHERS)



- Medium-sized songbirds with soft, silky plumage, and small bill used for plucking berries; most are slender and crested, with long tail.
- 18–24·5 cm.



- South-west USA and Middle America.
- Montane forests and pastures, deserts, riparian woodlands.
- 3 genera, 4 species, 10 taxa.
- No species threatened; none extinct since 1600.

Systematics

Named for the silky appearance of their plumage combined with their aerial acrobatics in pursuit of insects, the silky-flycatchers make up a small family of oscine songbirds found only in the south-western USA, Mexico, Guatemala and the mountains of Costa Rica and Panama. They are not closely related to the suboscine tyrant-flycatchers (Tyrannidae), and they are more closely related to the waxwings (Bombycillidae) than they are to the Old World flycatchers (Muscicapidae). Although they may engage in extensive flycatching during the breeding season, they are, like the waxwings, frugivorous throughout the year.

From the time when the first silky-flycatchers were discovered, during the early to middle part of the nineteenth century, they were considered to be closely related to the waxwings, a notion upheld by evidence from DNA–DNA hybridization research carried out more than a century and a half later. Waxwings and silky-flycatchers exhibit similarities in a number of morphological characters, such as the conspicuous crest on the head, the texture of the plumage and the shape of the bill. The silky-flycatchers are, however, distinct from the waxwings in such features as the more rounded wings and, for those species for which the information is known, in having downy nestlings and an unstreaked juvenile plumage.

The relationships of the two groups to other families have been a matter of controversy historically, and are still unresolved. Before 1900, most authors classified the silky-flycatchers, the waxwings and an odd Hispaniolan species, the Palmchat (*Dulus dominicus*), in a single family, Ampelidae. In 1904, R. Ridgway recognized each of these groups as separate families, placing the silky-flycatchers in Ptilogonatidae, the waxwings in Ampelidae and the Palmchat in Dulidae. Later, in 1949, J. Delacour and D. Amadon suggested that the first two of these be maintained as subfamilies in a new family, Bombycillidae, along with another subfamily, containing just the Hypocolius (*Hypocolius ampelinus*) of Iraq and adjacent countries, and possibly with the Palmchat as a fourth subfamily. Subsequent taxonomists have continued to issue conflicting opinions about the relationships of the Hypocolius and the Palmchat to the waxwings and silky-flycatchers.

In their 1990 analysis, using DNA–DNA hybridization, C. G. Sibley and J. E. Ahlquist suggested that silky-flycatchers and waxwings diverged from one another more recently than they did from the Palmchat lineage. Unfortunately, these scientists were unable to obtain samples from the Hypocolius for genetic analysis. On the basis of the molecular evidence, they classified the first three as tribes, respectively the Ptilogonatini, the Bombycillini and the Dulini, within the family Bombycillidae, which they placed in a superfamily Muscicapoidea. In the latter, they also included the dippers (Cinclidae), along with a greatly expanded Muscicapidae that contained not only the Old World flycatchers but also the thrushes (Turdidae), and an expanded Sturnidae comprising the mockingbirds and thrashers (Mimidae), as well as the starlings proper.

Townsend's Solitaire (*Myadestes townsendi*) was initially considered a silky-flycatcher, and was described in the genus *Ptiliogony's* [*sic*] by J. J. Audubon in 1838. Twenty-six years later, S. F. Baird suggested that *Myadestes* had affinities with the thrushes, an arrangement adopted in subsequent classifications. In 1973, Sibley advocated the inclusion of *Myadestes* with the Ptilogonatidae, on the basis of electrophoretic patterns of egg-white proteins. No change was made in the 1983 *American Ornithologists' Union Check-list of North American Birds*, however, in part because of differences between the two groups in nesting behaviour.

Another thrush-like bird, the Black-and-yellow Silky-flycatcher (*Phainoptila melanoxantha*), is still included in the family Ptilogonatidae, despite a degree of scepticism by some authors. Among these are Ridgway, who, in 1904, wrote that *Phainoptila* is doubtfully a member of this family and "so far as the adult is concerned might easily be referred to the Turdidae [thrushes] without materially affecting the diagnosis of the latter family". The other silky-flycatchers, the Phainopepla (*Phainopepla nitens*), the Grey Silky-flycatcher (*Ptilogonys cinereus*) and the Long-tailed Silky-flycatcher (*Ptilogonys caudatus*), share striking morphological features and behavioural traits, including a prominent crest, a slender body with a long tail, a preference for high perches and open spaces, and a relatively sociable nature. These characteristics contrast with those of the Black-and-yellow Silky-flycatcher, which has a thrush-like aspect, lacks a crest, has a heavier body with a shorter tail, and leads a solitary and reclusive life in dense forest. Whether or not this species is a rightful member of the Ptilogonatidae remains to be resolved, perhaps by new molecular evidence.

Morphological Aspects

With the exception of the Black-and-yellow Silky-flycatcher, the members of the Ptilogonatidae are slender, long-tailed birds pos-



The silky-flycatchers are a small group of oscine passerines, for the most part with prominent crests, slender bodies and long tails. In all four species males have longer tails and bolder patterning than females, but sexual dichromatism is most pronounced in the ***Phainopepla****, the male of which is jet-black (with white wing-patches visible in flight), and the female grey. Seasonally, this species is one of the most abundant songbirds in the deserts of the south-western USA, especially the Sonoran Desert, where the black plumage of males maximizes their conspicuousness.*

[*Phainopepla nitens lepida*, Santa Rita Mountains, Arizona, USA. Photo: Tom Vezo]

sessing a conspicuous crest, which they can raise and lower expressively. The plumage appears soft and glossy. In colour, they range from the jet-black of the male Phainopepla, the vernacular name of which derives from the Greek and means "shining robe", to the variegated pattern of the colourful Long-tailed Silky-flycatcher, which presents hues varying from pale grey to olive-green and bright yellow. The Black-and-yellow Silky-flycatcher differs in appearance from the others, as it has a relatively stout body, a short tail and no crest, and lacks white patches on the tail and wings.

Phainopeplas have bold white wing patches that flash in flight and are revealed also when the wings are spread. The Grey and Long-tailed Silky-flycatchers have much white on the tail; when they twist and turn in the air in pursuit of insects, they spread the tail, revealing contrasting areas of black and white. The two central rectrices of the Long-tailed Silky-flycatcher extend beyond the others, giving the tail an even greater appearance of length. A. F. Skutch wrote evocatively that "Even in the gales which blow over the high mountains for hours or days together, the silky-flycatchers choose… exposed perches, where they rest while the strong wind ruffles their plumage and twists their tails."

All of the members of the family are sexually dimorphic, the males having a longer tail and bolder or brighter plumage than the females. The contrast in colour between the sexes is most striking in the Phainopepla, the male of which is jet-black whereas the female is grey. A study of the thermal properties of the male's plumage suggests that increased heat gain from the black coloration is small compared with the effects of temperature regulation achieved by behaviour, such as perching posture and selection of micro-habitats. Optical properties indicate that black plumage maximizes visual conspicuousness in the desert, where Phainopeplas maintain winter territories and where they breed in spring.

The plumage of juveniles generally resembles that of females, but the juvenile feathers have a loose texture. After the first moult, in autumn, the plumage of young male Phainopeplas varies from mostly grey to black; some males are pied, with a mixture of black and grey. Young males with some grey in the plumage have fewer protein reserves than do males of the same age that are entirely black.

Silky-flycatchers have a relatively small bill, with which they pick large numbers of small berries. These they swallow whole. The Phainopepla has adaptations in the digestive system that aid in the efficient processing of large quantities of the berries of desert mistletoe (*Phoradendron californicum*), its staple food in the desert during the months of October to April (see Food and Feeding). Most other bird species have difficulty in handling these fruits because, when they break the exocarp, or skin, to expose the pulp, the latter, being sticky, adheres to the bill. Phainopeplas, on the other hand, rapidly swallow the berries whole. The berries collect in the crop, and then pass one at a time into the gizzard. When the gizzard contracts, it extrudes the seed, retains the exocarp, and squirts the pulp into the small intestine. After 12–24 berries have been processed, the gizzard ejects the exocarps all together.

Habitat

The silky-flycatchers inhabit woodlands and deserts in the south-western USA, Mexico and Guatemala, and montane forest and pastures in Costa Rica and Panama. They are most common in areas with numerous berry-producing plants, including mistletoe of the genus *Phoradendron*, redberry (*Rhamnus*), *Schefflera robusta* and *Clusia estenofila*. The Black-and-yellow Silky-flycatcher resides beneath a dense forest canopy, whereas the other three species prefer open spaces with scattered trees.

Black-and-yellow Silky-flycatchers are restricted to the mountain ranges of Costa Rica and western Panama. Usually found above 1200 m, they are most common in evergreen subalpine and elfin forests. On exposed peaks and ridges, the gnarled trees of the elfin forests are 2–10 m in height, and cloaked in bryophytes. Beneath the dense canopy, small trees and bushes form the understorey and the ground is carpeted with a mat of bryophytes and protruding herbs. This species is also found, but to a lesser extent, in upper montane forest where vegetation similar to that of the subalpine forest is present in second-growth areas and natural gaps. Important fruiting plants here include those of the families Araliaceae, Melastomataceae, Rubiaceae and Ericaceae.

Like the previous species, the Long-tailed Silky-flycatcher is found in the mountains of Costa Rica and western Panama. In contrast to it, however, it prefers open habitats, such as secondary forest and pastures with scattered trees at elevations of about 1800–3000 m. Occasionally, Long-tailed Silky-flycatchers perch on the tops of trees of adjacent dense woodland or fly over them. The Grey Silky-flycatcher, too, is an inhabitant of montane woodland with scattered trees. It lives among pine (*Pinus*), oak (*Quercus*) and juniper (*Juniperus*) at elevations of 1000–3500 m in Mexico and Guatemala.

In the south-western USA, Phainopeplas are found in deserts and riparian woodland at different times of the year. During Oc-

tober and through to mid-April, they maintain territories in deserts, especially the Sonoran Desert, in Arizona, where they reach their highest densities in the country. This species is one of the most conspicuous and abundant winter songbirds in desert washes where leguminous trees and shrubs, such as palo verde (*Cercidium*), mesquite (*Prosopis*) and acacia (*Acacia*), have been parasitized by the desert mistletoe, the fruits of which are avidly consumed by this ptilogonatid. By the end of April, most Phainopeplas have departed from the desert. By June and July, nearly all are found in riparian-woodland habitats dominated by oaks and sycamore (*Platanus racemosa*), with an abundance of such fruiting shrubs as redberry and elderberry (*Malosma laurina*). They breed in the desert during the spring and in riparian woodland during the summer. In Mexico, this species is found in arid to semi-arid habitats with scattered trees and bushes and along riparian washes.

General Habits

In their fondness for open spaces, their conspicuous presence on the highest perches, and their social behaviour, the Phainopepla and the Grey and Long-tailed Silky-flycatchers share similar habits. Either one of the the first two species could, for example, easily fit Skutch's description of the Long-tailed Silky-flycatcher: "A far-ranging, restless bird of open spaces... This silky-flycatcher alights by preference on the topmost, exposed twigs of tall trees, where it perches very upright, with its high crest and long tail making it appear elegantly tall and slender and presenting an unmistakable profile against the sky."

When travelling, these three species typically fly above the tops of the trees. During the non-breeding season, they move from treetop to treetop in loose, straggling flocks. The Phainopepla and the Long-tailed Silky-flycatcher sometimes zigzag erratically in flight, especially when descending from the air to alight on a perch.

Whether atop a high lookout or in buoyant flight above the trees, Phainopeplas and Grey and Long-tailed Silky-flycatchers often announce their presence with loud contact calls, flight calls, and aggressive warnings. They rarely land on the ground. The Phainopepla, when nest-building, does descend to collect plant fibres, spider silk and twigs from the ground, but the Long-tailed Silky-flycatcher gathers material, primarily lichens, directly from vegetation.

Silky-flycatchers often flutter buoyantly, sometimes changing direction erratically at the last moment. B. Torrey, writing about the Phainopepla, commented that "No matter where they might be going, though the flight were only a matter of a hundred yards, they progressed always in pretty zigzags, making so many little, unexpected, indecisive tacks and turns by the way, butterfly fashion, that you began to wonder where they would finally come to rest."

Neither solitary nor excessively gregarious, the Phainopepla and the Grey and Long-tailed Silky-flycatchers are characterized by loose sociality during both the breeding season and the non-breeding season. Skutch remarked that, although they seek the company of their own kind, they do not perform any co-ordinated group movements but, instead, remain independent. He was of the opinion that an observer, watching these birds, would quickly conclude that their life is "a continual compromise between gregarious and individualistic impulses".

Phainopeplas, for example, defend breeding territories in the desert during the spring, but both before and after this period, during courtship and soon after nesting, they gather in loose groups, perching and flitting about in the same set of trees. They leave the desert in loose flocks and arrive in May in riparian woodlands, where they settle in loose colonies to breed during the summer. After the nesting season ends, this species and the Grey and Long-tailed Silky-flycatchers move about in loose, straggling flocks.

In general habits, as in appearance, the Black-and-yellow Silky-flycatcher differs significantly from the three other members of the family. Rather than exploiting open spaces with scattered trees, it prefers the dense cover of forest, where it is secretive, less active, and quieter. It is usually encountered singly or in solitary pairs during the breeding season, and when flycatching it tends to travel from perch to perch, rather than sallying back and forth (see Food and Feeding). Skutch's description of the Black-and-yellow Silky-flycatcher, although brief, remained the most detailed account of the species for more than three decades. He wrote that it was regrettable that so little was known about this species, and that his field observations led him to feel the strength of Ridgway's remark that the genus *Phainoptila* is doubtfully a member of the Ptilogonatidae (see Systematics).

Voice

Although they are not renowned for their musicianship, most of the silky-flycatchers are loud and voluble. The Phainopepla and the Long-tailed Silky-flycatcher are also accomplished mimics, capable of imitating other bird species. As Skutch wrote, "It is evident that the silky-flycatchers, although vocally poorly endowed, are capable of producing a wide variety of utterances to meet the various contingencies of their lives."

The Black-and-yellow Silky-flycatcher has the weakest voice, and apparently it does not sing. It utters a slight "tsip" note, reminiscent of the calls of some New World warblers (Parulidae), and it also twitters softly. The loudness and tempo of calls increase before the birds take flight. Skutch overheard low, soft notes exchanged by the two members of a pair that was foraging in the rain.

The other three ptilogonatids use loud call notes while perched at the top of a tall tree or shrub. They also employ the call note to express alarm. The Phainopepla often turns from side to side, flicking the tail as it calls. Long-tailed Silky-flycatchers use three kinds of vocalization in flight; in addition to emitting the same call as that used while perched, they utter a drawn-out clicking, likened to the sound of pebbles being rattled in a box, and a bell-like tinkling noise. Phainopeplas, when chasing one another in flight, give a harsh "churr".

During the nest-building stage of the year, Phainopeplas utter distinctive calls when partners exchange places on the nest. While constructing the nest, they also snap the mandibles together to produce a series of rapid clicking sounds. This species is the only member of the family reported as having a loud song, which is usually given only in the courtship period, before egg-laying. Phainopeplas sing at least 14 different short elements, repeated and mixed in variations, including a loudly whistled "wheedle-ah", a thin downslurred note, a harsh buzz,



*The **Long-tailed Silky-flycatcher** is an elegant Central American form in which the tail is dramatically modified in pattern and shape, having a sharply demarcated white bar and greatly elongated central rectrices. Its bill is short and stubby, and its plumage soft and dense, recalling waxwings (Bombycillidae). Like that family, it is essentially frugivorous and seasonally gregarious. It is found in the mountains of Costa Rica and western Panama, where it prefers open habitats, including the upper canopy of secondary forest and pastures with scattered trees.*

[*Ptilogonys caudatus*, Cerro de la Muerte, Costa Rica. Photo: Michael & Patricia Fogden]



*The **Black-and-yellow Silky-flycatcher** is restricted to the volcanic mountain ranges of Costa Rica and western Panama, where it is usually found above 1200 m in the undergrowth of humid evergreen forests, including stunted, epiphyte-laden elfin forests. Apart from its predilection for lower growth, it is anomalous within the family in lacking a prominent crest, as well as white patches in the remiges or rectrices. Further, its heavy body and short tail give it a thrush-like aspect, which is bolstered by its solitary nature. As such, and despite resembling* Ptilogonys *in overall colour and pattern, the allocation of* Phainoptila *to Ptilogonatidae remains a topic of disagreement, with some authorities claiming that it sits more comfortably in Turdidae. Further details of its evolutionary history should be sought, and a thorough biomolecular analysis undertaken.*

[*Phainoptila melanoxantha*, Cerro de la Muerte, Costa Rica. Photo: Michael & Patricia Fogden]

and an utterance reminiscent of the ring of a telephone. In addition, both this species and the Long-tailed Silky-flycatcher produce quiet songs composed of low lisping notes, whistles, warbles and other sounds that are barely audible even from close range.

In response to predatory threats at the nest, the two above-mentioned species sometimes imitate the calls of other bird species. Either sex utters these quiet vocalizations while fluttering among nearby branches, or while worriedly watching from a perch as a human being inspects the nest. The calls of one Long-tailed Silky-flycatcher reminded Skutch of the alarm notes of the American Mountain Thrush (*Turdus plebejus*); this individual also uttered other, varied sounds that were too soft to be identified. Phainopeplas quietly imitate calls of the Red-tailed Hawk (*Buteo jamaicensis*), the Northern Mockingbird (*Mimus polyglottos*), the Northern Flicker (*Colaptes auratus*) and others.

When Phainopeplas are captured and handled, they imitate other species loudly, sometimes stringing together different vocalizations in rapid succession, and continuing to do so for minutes on end. During handling, they have been recorded as imitating the sounds of at least twelve species, including the Red-tailed Hawk, the Northern Flicker, Gambel's Quail (*Callipepla gambelii*), and the sound made by American Mourning Doves (*Zenaida macroura*) when flapping their wings in flight. Some Phainopeplas captured in the desert imitate species found only in coastal woodlands, and the reverse has also been

reported; these observations suggest that the birds retained what they had learnt in one habitat after they moved to a different region. They will also at times punctuate these imitations with loud, harsh distress calls.

The purpose of the imitations is unknown. In the only reported instance of a Phainopepla using mimicry in a natural context, an individual, as it fled from a Loggerhead Shrike (*Lanius ludovicianus*), imitated the cry of a Red-tailed Hawk. The shrike, undistracted, killed the Phainopepla. Results of playback experiments reveal that Phainopeplas and other species often respond to scream calls and imitations by approaching and mobbing a predator decoy, regardless of whether their own species' calls were imitated. The broadcasting of harsh distress calls alone elicited strong mobbing responses by Phainopeplas and others, and imitations appear to play only a minor role, if any, in escalating mobbing behaviour.

Adult Phainopeplas and Long-tailed Silky-flycatchers sometimes emit loud harsh distress calls when their chicks are removed from a nest. Phainopeplas breeding in loose colonies use these calls when Western Scrub-jays (*Aphelocoma californica*) approach a nest; nearby pairs respond to the calls by approaching rapidly, mobbing the jay, and adding their own cries to the ruckus. Nestlings also utter distress calls when captured and handled by humans.

Food and Feeding

Silky-flycatchers feed primarily on fruit and insects. During the non-breeding season, when insects are much scarcer or absent, the diet consists exclusively of fruit. The distribution, social behaviour, timing of breeding and movements of these species are all strongly influenced by the availability of berries. In turn, the silky-flycatchers, by dispersing the seeds of berry-producing plants, play an important role in the shaping of the plant communities of the habitats in which they live.

All four ptilogonatids typically pluck berries and swallow them whole while clinging to clusters of the fruits or perched on a stem or branch. The Phainopepla and the Grey and Long-tailed Silky-flycatchers are relatively active as they forage, but Skutch described the Black-and-yellow Silky-flycatcher as sluggish. One pair that he watched remained in a chili tree (*Drimys winteri*) for almost an hour, during which time the two birds fed avidly on the highly flavoured fruits, alternating this with periods during which they rested motionless within the shelter of the glaucous foliage, the head drawn in and the plumage puffed out, while they digested their meal.

Berries from a variety of plants are eaten, depending on the availability of each. For example, Phainopeplas consume berries exclusively of desert mistletoe during the winter months in the desert, but in the summertime, in coastal woodlands, they eat the fruits of redberry, blue elderberry (*Sambucus mexicanus*) and sumac (*Rhus*). Black-and-yellow Silky-flycatchers take fruits of at least 40 different plants from 36 genera. In Costa Rica, they consume fruits of more species in the Talamanca and Tilarán mountain ranges than they do in the Volcánic Central and Guanacaste mountains, reflecting the patterns of plant-species richness.

The members of this family capture aerial insects by hawking them from a perch. Black-and-yellow Silky-flycatchers often travel through the air in pursuit of insects, and land on a perch different from the one where they began. In contrast, the other ptilogonatids usually sally back and forth from the same perch. Once airborne, they often twist and dive gracefully to intercept a flying insect before returning to the perch, flashing white patches on the tail or wings as they flutter. When insects swarm in coastal woodlands, Phainopeplas flycatch in groups on the wing in the manner of swallows (Hirundinidae), especially in the evening when the angle of the sun's light illuminates the swarms.

The timing of overlap in availability of fruits with that of insects probably determines when and where silky-flycatchers will breed (see Breeding). This is because the parents feed their nestlings initially with insects, and with increasing proportions of berries as the young grow. In January, Phainopeplas devote about 11·5% of the daytime activity to fruit-eating; this compares with 4·7% in March, when they also feed on insects. In one study, pairs with young engaged in extensive flycatching for about 11·6% of the day, this being approximately 20 times greater than the figure for Phainopeplas without young.

Foraging patterns are often determined by the spatial distribution of fruit. In one study, radiotracked Black-and-yellow Silky-flycatchers spent 9–12 minutes at one location before moving distances of 39–100 m to a new patch of fruit, without feeding along the way. Long-tailed Silky-flycatchers and Phainopeplas in riparian woodland sometimes fly several hundred metres and out of sight of the human observer, apparently in search of fruiting shrubs.

The distribution of fruits appears also to be an important determinant of sociality among ptilogonatids during the breeding season. Long-tailed Silky-flycatchers and Phainopeplas breed-





With the exception of Phainoptila, *members of this family prefer high bare treetops and open spaces. They prefer to perch upright in the topmost branches of trees, on which their elegant outlines and pied tails are noticeable, and from which they launch aerial pursuits of flying insects. During the non-breeding season, they move about in loose, straggling, noisy flocks. Typical in all these respects, the* ***Grey Silky-flycatcher*** *is an inhabitant of open montane pine* (Pinus), *oak* (Quercus) *and juniper* (Juniperus) *woodland in Mexico and Guatemala. This individual was photographed as a vagrant to the USA.*

[*Ptilogonys cinereus*, San Diego County, California, USA. Left, photo: Brian E. Small. Right, photo: Herbert Clarke]



Although it may engage in prolonged bouts of flycatching during the breeding season, even foraging on swarms of insects in continuous flight like swallows, the ***Long-tailed Silky-flycatcher*** *is essentially frugivorous. It eats fruit and berries throughout the year, plucking them in large numbers from trees with its relatively small bill, and swallowing them whole.*

[*Ptilogonys caudatus*, Cerro de la Muerte, Costa Rica. Photo: Marco Saborío]

ing in riparian woodlands are loosely colonial. In these habitats, fruiting plants thrive in sunny areas away from nest trees and are not easy to defend from competitors. In contrast, Phainopeplas breeding in the desert are territorial; here, the primary source of fruit, desert mistletoe, grows on trees used for nesting, and is distributed relatively uniformly throughout the available habitat.

Silky-flycatchers are important dispersers of the seeds of berry-producing plants. In the Monteverde Forest Reserve, in Costa Rica, the Black-and-yellow Silky-flycatcher has been found to be one of three major dispersers for three plant species growing in treefall areas, even though the fruits of these make up a relatively minor proportion of its diet. It disperses the seeds typically within 30 m of the parent plant, but sometimes as much as 500 m or more from it. Seeds deposited by Black-and-yellow Silky-flycatchers germinate more effectively than do the seeds of unconsumed fruits.

Similarly, the Grey Silky-flycatcher is an important disperser of the mistletoe *Psittacanthus schiedeanus* in a cloudforest remnant near Xalapa, in the Mexican state of Veracruz. Here, the abundance of this ptilogonatid varies with the abundance of ripe mistletoe fruits. The Phainopepla, too, is an important disperser of mistletoe. It defecates the seeds of the parasitic desert mistletoe on appropriate host plants, demonstrating a preference for perching on the leguminous trees and shrubs that the parasite requires. Expelled seeds typically pile up as reddish towers beneath favoured perches. Experiments involving the removal of mistletoe revealed that the Phainopeplas deposit seeds disproportionately on tall trees already infested with mistletoe, presumably because they are attracted to tall perches and sources of fruit. Phainopeplas thus influence the distribution of mistletoes, and thereby that of other species of bird, mammal, insect and fungus that consume mistletoe leaves or berries, use mistletoe clumps as shelter, or take advantage of weakened trees.

Breeding

The Ptilogonatidae apparently rear just a single brood in each breeding season, as they are restricted by the brief period when both insects and fruit are abundant. The Phainopepla, however, is unusual among songbirds in that it breeds in two distinct types of habitat at different times of the year. Although it is unknown whether the same individuals breed in both habitats, the respective timings of movement and of breeding suggest that this species may be able to raise two broods annually by moving between habitats where food resources reach a peak at different times of the year. These birds also exhibit striking differences in their social behaviour in these two habitats, this being influenced by the spatial distribution of fruit and nest-sites.

Phainopeplas spend the winter months in the desert, where desert mistletoe, their sole source of winter food (see Food and Feeding), generally bears fruit from November to April. Males and females defend separate territories until late January or February, just prior to the insect bloom, at which point they begin to defend territories as pairs. The insect biomass doubles from the time of egg-laying, in mid-March, to the incubation and nestling stages, in late March and April. Berry abundance, however, declines during this period, and nearly all adults and juveniles depart by the time the mistletoe berries are depleted, in May.

In April and May, meanwhile, Phainopeplas start to arrive in riparian woodlands, in localities ranging from several kilometres to hundreds of kilometres from the desert. Rather than defending territories here, they cluster in loose colonies of 3–15 pairs. In southern California, redberry bushes begin to produce ripe fruits in late May. Although insect mass decreases from the pre-laying period to the post-laying period, berry abundance increases dramatically at this time. In this habitat, the Phainopeplas lay eggs primarily during the first weeks of June. By August, few *Rhamnus* berries remain, thus bringing the summer breeding season to a close.

There are notable similarities in social behaviour between the Long-tailed Silky-flycatcher and Phainopeplas nesting in riparian woodlands. Both species breed in loose colonies, which are separated from each other by a distance of 400 m or more. Within these colonies, the nests are 25–200 m apart. Although the breeding pair defends a small area around the nest, individual pairs forage without aggression at nearby fruiting shrubs clustered in open areas away from the trees where they nest.

Silky-flycatchers are socially monogamous. Little is known about the courtship and breeding habits of the Grey Silky-flycatcher and the Black-and-yellow Silky-flycatcher. The behaviour of the Phainopepla, on the other hand, is better known. In the desert, this species engages in courtship flights in which one or two males fly over their respective territories, in a circling or zigzagging pattern, for periods ranging from 15 seconds to as long as seven minutes, and as many as nine Phainopeplas may join the flight. Courting individuals will also gather in a large

tree and remain there for up to 20 minutes; 14 Phainopeplas have been recorded at such assemblies.

During the courtship and nest-building stages, the male Phainopepla offers gifts of berries or insects to his mate, as also does the male Long-tailed Silky-flycatcher. The males of these two species initiate nest-building, but both sexes contribute in later stages of the construction work. Male Phainopeplas display by descending to the nest-site with exaggerated fluttering wingbeats. During the nest-building process, the partners take turns in shaping the nest. From time to time they exchange soft vocalizations, and make rapid clicking sounds with the bill.

The members of this family build open cup-nests in shrubs, trees or cacti. The Phainopepla and the Grey and Long-tailed Silky-flycatchers often place their nests in a shrub, in the fork of a tree, or on a horizontal branch. They sometimes build nests in locations that blend in with the surroundings, but in sites that may not be well concealed by foliage. Grey and Long-tailed Silky-flycatchers use lichens in the construction of their nests, perhaps as a means of camouflage.

Almost all known nests of ptilogonatids have contained two eggs, the sole exception being the nests of Phainopeplas, which may contain two, three or, rarely, four eggs. The average clutch size of the last-mentioned species is greater in years with heavier rainfall, and is higher in riparian woodland than it is in the desert. The eggs of all four species are pale grey or greyish-white, with a sprinkling of brown and lilac spots over the surface; those of the Phainopepla and the Grey and Long-tailed Silky-flycatchers sometimes have a band of markings near the large end. The eggs of Black-and-yellow Silky-flycatchers are relatively blunt and larger than those of the other members of the family, but are otherwise similar in appearance.

Little else is known about the breeding behaviour of this family, and details are available for only two species. In the case of the Phainopepla, both sexes contribute about equally to the duty of incubation, which lasts for 14 days. The incubation period for the Long-tailed Silky-flycatcher is 16–17 days, and the female does all of the work. On hatching, the chick of the latter species has compact tufts of whitish down in neat rows, separated by larger areas of dark bare skin, whereas the Phainopepla hatchling has scant white down and greyish-black skin; the bill is black, the edges of the mouth are yellow, and the eyes are closed. Both parents feed the young, and both also keep the nest clean by consuming the nestlings' faecal sacs. The nestling stage is long for songbirds, 20 days in the case of the Phainopepla and 24–25 days in the Long-tailed Silky-flycatcher. The chicks of these two species, as they approach the time of fledging, usually sidle out from the nest on to nearby branches, but they then return to the nest for a further day or two before leaving for good.

Recorded nest predators of Long-tailed Silky-flycatchers include the Prong-billed Barbet (*Semnornis frantzii*), the Emerald Toucanet (*Aulacorhynchus prasinus*) of the blue-throated subspecies *caeruleogularis*, and the Brown Jay (*Cyanocorax morio*). Nests of Phainopeplas are preyed on by snakes, by the Loggerhead Shrike, by the Western Scrub-jay and by the Common Raven (*Corvus corax*). Brown Jays and Common Ravens may be coming into greater contact with silky-flycatchers as a result of deforestation and development.

The breeding success of Phainopeplas varies with annual rainfall. The number of individuals that do not attempt to breed increases in years with low or sparse rainfall, as it does also when the mistletoe crop fails because of drought or freezing temperatures. Low total productivity in the desert is accounted for mainly by high numbers of non-breeders, whereas predation is the primary cause of poor breeding success in coastal riparian woodlands. It is possible that, in southern California, brief nesting periods and unpredictable events such as drought have selected for opportunistic breeding in response to regionally and temporally shifting food supplies.

Movements

Ptilogonatids do not undertake any long movements. All are either residents or short-distance migrants. The Black-and-yellow Silky-flycatcher remains throughout the year in the forests of Costa Rica and Panama. During the non-breeding season, it associates in small, loose flocks, some of which occasionally descend to lower elevations during the winter months. Similarly, the Grey and Long-tailed Silky-flycatchers are resident, but they, too, leave their nesting sites after the breeding season and roam adjacent areas in loosely integrated groups. Both breed in montane habitats in Middle America, and, as the previous species, they sometimes make post-breeding movements downslope in some regions. This applies particularly to the Grey Silky-flycatcher, which may vacate the north-west part of its Mexican range during the winter months.

The Phainopepla is the only species that regularly undertakes migrations, moving between desert and woodland habitats that may be separated by only a few kilometres or by hundreds of kilometres. In Mexico, these migratory movements are poorly understood, but at least some populations appear to move southwards to spend the winter in central Mexico.

Straggling flocks of ptilogonatids can contain dozens of individuals. Often, several will perch in the same tree or group of trees, and then the flock departs in small groups, all heading in the same general direction. Rarely, flocks of as many as 200 Phainopeplas or Grey Silky-flycatchers have been reported.

Relationship with Man

Silky-flycatchers are often found in remote areas, such as deserts and wind-swept mountains, but they sometimes settle close to human habitation where food and nest-sites are available. In Costa Rica, for example, Long-tailed Silky-flycatchers can be abundant on highland farms, where they forage and breed in pastures with scattered trees. In the south-western USA, Phainopeplas sometimes nest in orchards or in suburban backyards where fruiting trees and shrubs have been planted. If they are responsible for any damage to these plants, this seems not to have brought them into any conflict with man's interests.

With the exception of the Black-and-yellow Silky-flycatcher, the ptilogonatids are bold and conspicuous birds, usually showing little fear of humans. They are often considered pleasing because of their elegant plumage, their fluttering flight in pursuit of insects, and their expressive vocalizations and body postures, including the raising and lowering of the crest.



*The **Phainopepla** spends much of its time eating berries, specializing at some sites on the desert mistletoe* Phoradendron californicum, *so much so that its digestive system has adapted to process large quantities of this item efficiently. As with other mistletoes, the seeds are extremely sticky, forcing Phainopeplas to regurgitate them and wipe them on nearby branches, where they germinate. Thus the behavioural pattern of the birds determines the distribution of the plants, and vice-versa: Phainopeplas typically perch in the canopies of tall desert trees, the crowns of which become festooned with mistletoes.*

[*Phainopepla nitens lepida*, California, USA. Photo: Herbert Clarke]



*Like other silky-flycatchers, the **Long-tailed Silky-flycatcher** builds an open cup-shaped nest, usually in an upright tree fork or balanced on top of a branch, as seen here. These nests are often ill-concealed by foliage, but profusely covered in lichen, presumably as camouflage. They are frequently clustered in loose colonies, with gaps of 25–200 m between each nest, and only a relatively circumscribed area defended by each individual pair. The usual clutch is of two eggs.*

[*Ptilogonys caudatus*, San Gerardo de Dota, Cordillera de Talamanca, Costa Rica. Photo: Marco Saborío]

As mentioned previously (see Food and Feeding), silky-flycatchers are important seed-dispersers. It is very likely that they play a significant role in the distribution of certain berry-producing plants, especially mistletoes, in the habitats that they occupy and, as a consequence, influence the distribution not only of such plants, but also of other animals dependent on the flora in question.

Status and Conservation

Silky-flycatchers are often abundant in appropriate habitats, and none of the four species is globally threatened. Nevertheless, because their global populations are small and their ecological requirements specific, the destruction of their habitats is a matter of long-term concern.

Black-and-yellow Silky-flycatchers are perhaps the most vulnerable. This species is fairly common to rather uncommon, and is restricted to high elevations on isolated mountain ranges disturbed by periodic volcanic activity. The three subspecies of the Black-and-yellow Silky-flycatcher inhabit mountain ranges separated by deep valleys. The north Costa Rican subspecies, *parkeri*, is found only in the cordilleras of Tilarán and Guanacaste, where it is confined to the upper levels above 1550 m. These mountain ranges are no more than 40 km long and 80 km long, respectively. An estimated 5820 hectares of suitable habitat are available for this taxon in the Cordillera de Guanacaste, where it is absent, rare or uncommon on five volcanoes and abundant only in the subalpine habitat of the Miravalles Volcano. In the Tilarán Range, there are 11,970 hectares of suitable habitat, and on Monteverde the silky-flycatchers are rare in upper montane forest and abundant in the subalpine zone. It is worth pointing out that, in this context, "rare" indicates that just one individual is likely to be recorded in a period of two days; "uncommon" means that 1–4 individuals would be seen in six hours, and "common" means that 5–10 can be expected in that same timespan. A taxon is considered "abundant" if the observer can reckon on finding more than ten individuals in six hours of observation.

Farther south in Costa Rica, the nominate race of the Black-and-yellow Silky-flycatcher is found on the larger Talamanca and Volcánica Central mountain ranges, where it is absent to abundant on various volcanoes in the upper montane forest and rare to abundant in subalpine forest. The estimated area of suitable habitat in the Talamanca Range is 153,750 hectares, with a further 37,705 hectares in the Cordillera Volcánica Central. There is little information on the population status of the third subspecies, *minor*, which occurs in western Panama, but it appears to be rare to uncommon in west Chiriquí.

Population levels of the Black-and-yellow Silky-flycatcher are influenced by volcanic activity, which destroys vegetation, and by windstorms and past deforestation, which create second-growth habitat suitable for nesting. This species occurs in low numbers on massifs that have experienced frequent and widespread volcanic disturbance. It is rare on the Irázu Volcano, which erupted in 1963, destroying vegetation at high elevations, but it is abundant on the Turrialba Volcano, which has been inactive since 1866. Black-and-yellow Silky-flycatchers may reside on active volcanoes, such as that of Poás, where mountain passes facilitate recolonization from nearby areas and where patterns of volcanic eruption have allowed areas with appropriate vegetation to persist.

The Grey Silky-flycatcher, while not considered globally threatened, is included on the "Partners in Flight Watchlist" as a species of medium conservation concern. Grey Silky-flycatchers are sometimes exported from Mexico to Europe for the cagebird trade, although the demand is lower than that for parrots (Psittacidae), and is also not so high as that for other songbirds, such as *Passerina* buntings (Cardinalidae). In 2003/04, trappers were authorized to harvest a total of 4130 Grey Silky-flycatchers. Estimates suggest that, during 21 years of legal trade, at least 92,140 individuals of this species have been taken from the wild.

Current threats faced by the Long-tailed Silky-flycatcher include loss of highland forest in Costa Rica and Panama. The main causes of this are burning, logging and agricultural expansion. Of particular concern is the fact that Panama's highland forests are largely unprotected. This species is still reasonably common, but acceleration of habitat destruction within its restricted range could render it vulnerable in the long term.

"Partners in Flight" lists the Phainopepla as a species in need of stewardship. In the south-west USA, Phainopeplas in southern California and Arizona inhabit deserts and riparian woodlands that are increasingly threatened by housing development and agricultural expansion. As they depend on both habitats for breeding (see Habitat, Breeding), the protection of both is important for the future survival of the species.

General Bibliography

Arvey (1951), Barrantes & Loiselle (2002), Bock (1994), Elphick *et al.* (2001), Hellmayr (1935), Mayr & Greenway (1960), Mayr & Short (1970), Rand & Rand (1943), Ridgway (1904), Sibley (1973, 1996), Sibley & Ahlquist (1990), Sibley & Monroe (1990), Skutch (1965a, 1985a), Walsberg (1977).



Genus *PHAINOPTILA* Salvin, 1877

1. Black-and-yellow Silky-flycatcher

Phainoptila melanoxantha

French: Phénoptile noir et jaune **Spanish**: Capulinero Negrigualdo
German: Gelbflanken-Seidenschnäpper
Other common names: Salvin's Silky-flycatcher, Phainoptila

Taxonomy. *Phainoptila melanoxantha* Salvin, 1877, San Francisco, Costa Rica.

Inclusion in present family questioned by some authors, who have pointed out this species' similarity to members of Turdidae and dissimilarities between it and other ptilogonatids in morphology and habits; further research, including DNA analyses, required. Three subspecies recognized.

Subspecies and Distribution.

P. m. parkeri Barrantes & Sánchez, 2000 – cordilleras of Tilarán and Guanacaste, in N Costa Rica.
P. m. melanoxantha Salvin, 1877 – cordilleras of Talamanca and Volcánica Central, in C & S Costa Rica.
P. m. minor Griscom, 1924 – W Panama (E to Veraguas).

Descriptive notes. 20·5–21·9 cm; 56–60 g. Unusual ptilogonatid, appearance like that of thrush (Turdidae), with tail shorter than wing, bill relatively large compared with that of others in family, no crest. Male nominate race is black on head, neck, back, uppertail-coverts, wings and tail, bright yellow on rump; below, black upper chest and thighs, yellowish olive-green upper breast and undertail-coverts, lower breast and belly grey, bright yellow sides and flanks; iris dark brown or dull red; bill and legs black or brownish-black. Female is black on top of head from bill to nape, grey on hindneck, face and throat, otherwise olive-green instead of black, rump duller than male.



Juvenile is generally duller than female, top of head to nape sooty grey, little or no yellow on flanks, plumage looser in texture. Race *parkeri* has shorter wing and tail than nominate, male completely yellow belly (rather than grey) and yellow undertail-coverts, female faint yellowish streaks on greenish-olive breast; *minor* is similar to nominate but slightly smaller, with longer bill, female has darker, more extensive grey on hindneck, greener (less yellow) rump, uppertail-coverts, and edgings of tail feathers. Voice. Thin, high-pitched "tsip" call, sometimes uttered in twitters. Not known to sing.

Habitat. Evergreen subalpine and elfin forests, with fruiting plants such as Araliaceae, Melastomataceae, Rubiaceae and Ericaceae; also, to lesser extent, montane forest with natural gaps and second-growth areas with vegetation similar to that of subalpine forest. 1000–3400 m.

Food and Feeding. Primarily frugivorous; eats small fruits of at least 40 plant species from 36 genera, including *Schefflera*, *Clusia*, *Erythroxylum*, *Myrsine*, *Psychotria*; fruit fed to fledglings. Some insects also taken, but few details. Forages sluggishly in trees, shrubs and epiphytes, from lowest levels of forest understorey up to canopy. Plucks berries while perched; swallows berries whole, voids seeds intact. During breeding season, observed to pluck "small creatures" from foliage and to capture aerial insects by flying out from exposed branches.

Breeding. Peak Mar–May; empty nests found in Apr, eggs in May, fledglings in Jun; adult moult late Jun. Monogamous; solitary nester. Open cup-nest mostly of green moss interspersed with slender stems and fern fronds, lined with fine rootlets and plant stems, outer diameter 22 × 16 cm, height 12 cm, inner cup 7 cm across and 5 cm deep, typically placed within 2–4 m of ground in crotch of sapling. Clutch 2 eggs; no information on incubation and fledging periods, nor on respective roles of sexes.

Movements. Resident. Moves between patchily distributed fruit sources; in small, loose flocks during non-breeding season, when occasionally moves downslope.

Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Uncommon to fairly common in Costa Rica above 1200 m (in N cordilleras) and 1800 m (in C & S ranges); race *parkeri* restricted to Cordilleras de Tilarán and Guanacaste, where fewer than 18,000 ha of suitable habitat remain. Abundance low on massifs with frequent, widespread volcanic disturbance. In Panama, rare to uncommon above 1650 m in W Chiriquí; local in C & E Chiriquí and Veraguas. Considered vulnerable over the long term because of restricted range in mountains of S Central America; burning of forests, logging, and agriculture have contributed to widespread habitat destruction in this region. A major disperser for fruiting plant species in treefall areas.

Bibliography. Angehr (2003), Anon. (1998b), Barrantes & Loiselle (2002), Barrantes & Sánchez (2000), Blake (1958), Hellmayr (1935), Kiff (1979), Murray (1988), Ridgely & Gwynne (1989), Ridgway (1904), Skutch (1965a), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996).

Genus *PTILOGONYS* Swainson, 1827

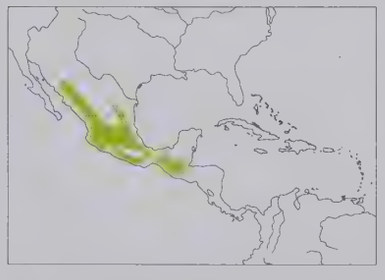
2. Grey Silky-flycatcher

Ptilogonys cinereus

French: Ptilogon cendré **German**: Grauseidenschnäpper **Spanish**: Capulinero Gris
Other common names: Grey Silky

Taxonomy. *Ptiliogonys* [*sic*] *cinereus* Swainson, 1827, Real del Monte, Hidalgo, Mexico.
Generic name in original description spelt as "*Ptiliogonys*", apparently in error by author, who had earlier described the genus by its current name (which he subsequently used) in what seems to have been an unpublished manuscript. This species may form a superspecies with *P. caudatus*. Four subspecies recognized.

Subspecies and Distribution.
P. c. otofuscus R. T. Moore, 1935 – NW Mexico.
P. c. cinereus Swainson, 1827 – C & E Mexico.
P. c. pallescens Griscom, 1934 – SW Mexico.
P. c. molybdophanes Ridgway, 1887 – S Mexico (Chiapas) and W Guatemala.



Descriptive notes. 18·5–21 cm. Slender, with prominent crest and long tail. Male nominate race has blue-grey head (including crest) and upperparts, dusky lores; flight-feathers and tail black, white band across base of tail extending about halfway down length of feathers (except for central pair); dull white or brownish-white chin and supraloral and malar regions, grey throat and chest, whitish belly, golden-olive or yellow flanks, bright yellow undertail-coverts; iris dark, narrow white eyering; bill and legs black. Female has grey head and crest, greyish-brown upperparts, brown sides and flanks, belly white. Juvenile resembles female, but paler below. Race *molybdophanes* is darker than nominate, male deeper bluish-grey above, olive colour on flanks more restricted and olive-green (instead of golden-olive), female also darker except for yellow of undertail-coverts; *otofuscus* is most similar in colour to previous, but with lighter upperparts, darker auriculars, grey of underparts not extending so far on belly, female with greyer back, lighter rump and uppertail-coverts and darker breast than nominate; *pallescens* is similar to nominate but paler and greyer, male chin, throat and supraloral greyish-white (rather than brownish-white), auriculars greyer and less brown, female also paler and less brown, with grey cap and throat contrasting more sharply with back and breast. Voice. Loud "tu whip, tu whip", second note higher in pitch and more emphatic; dry "chi-che-rup che-chep", and nasal "k-lik"; rattling note in flight. Quiet song a warbled series of "chuck" notes, high "seep" notes and quiet whistles.

Habitat. Montane pine (*Pinus*), oak (*Quercus*) and juniper (*Juniperus*) forests, ranging into open areas with scattered trees; 1000–3500 m, lower in winter.

Food and Feeding. Insects and berries. Berries of mistletoes (Loranthaceae) especially important; numbers of present species vary with abundance of ripe fruits of the mistletoe *Psittacanthus schiedeanus*. Other fruits consumed include *Monnina xalapensis* and *Eurya theoides*. Captures aerial insects by sallying from a perch.

Breeding. In Mexico, two nests under construction in late May in Tamaulipas and nest with chicks in Jun in Morelos. Open cup-nest of oak catkins, coarse black hairs and vegetation, interior padded with stiff *Usnea* lichens (lining lacks grasses or long plant stems), large pieces of foliose lichen attached with cobwebs to exterior, placed 9 m up in oak tree. Clutch 2 eggs; no information on incubation and fledging periods.

Movements. Generally resident. Some downslope movement in winter, when also wanders into adjacent habitat; may vacate NW Mexico, recorded as visitor near Alamos (S Sonora) and San Blas (Nayarit). In cloudforest near Xalapa, in Veracruz (E Mexico), common at 1300 m, in pairs or groups of 3–6 individuals, during Nov–Mar. Vagrant to USA.

Status and Conservation. Not globally threatened. Common to fairly common in much of range; uncommon in NW Mexico (Sonora). Found in 32 Important Bird Areas, including seven protected areas, in Mexico. Not at any apparent risk, but cause for long-term concern because of globally restricted range. Listed on "Partners in Flight Watchlist", considered of medium conservation concern. Legal harvest for cagebird trade surpasses 4000 individuals annually. An important disperser of mistletoe in cloudforest remnant near Xalapa (Veracruz), in Mexico.

Bibliography. Anon. (1998b), Binford (1989), Blake (1953), Browning (1989), Cota-Campbell & Ruiz-Campos (1995), Dearborn (1907), Forcey (2002), Gómez de Silva *et al.* (1999), Hellmayr (1935), Howell & Webb (1995), Kaufman (1996a), Land (1970), Lasley & Pincelli (1986), López & Ornelas (1999, 2001), Lowery & Dalquest (1951), Newman (1950), Ridgway (1904), Rowley (1966), Skutch (1965a), Stotz *et al.* (1996), Yanega (1996).

3. Long-tailed Silky-flycatcher

Ptilogonys caudatus

French: Ptilogon à longue queue **Spanish**: Capulinero Colilargo
German: Langschwanz-Seidenschnäpper

Taxonomy. *Ptilogonys caudatus* Cabanis, 1861, Irazú, Costa Rica.
May form a superspecies with *P. cinereus*. Monotypic.

Distribution. Costa Rica and W Panama (E to Veraguas).



Descriptive notes. Male 23·7–24·4 cm, female 20–21 cm; 37 g. Slender, with prominent crest and long tail, central pair of rectrices extending beyond the rest. Male has forehead and crown grey, rest of head, crest and neck yellowish olive-green, throat tinged with grey; back, rump, uppertail-coverts and upperwing-coverts bluish-grey; flight-feathers and tail black, inner webs of tail feathers (except two central pairs) with large white patch on middle portion; breast and upper belly slightly paler grey than back, sides, flanks and lower belly yellowish olive-green, undertail-coverts bright yellow; iris dark, narrow yellow eyering; bill and legs black. Female is duller than male, with head, neck and crest paler yellowish olive-green, back, rump, uppertail-coverts, wing-coverts, breast and upper belly olivaceous grey (instead of bluish-grey), duller greenish-yellow on flanks, lower belly yellowish-white, undertail-coverts dullish yellow, shorter and duller tail. Juvenile is light greyish-brown with brownish bill and feet, whitish eyering; uppertail-coverts darker brown, underparts paler, undertail-coverts pale yellow with greyish bases. Voice. Call a sharp, dry "che chip, che chip", likened to sound of loose pebbles in a box when uttered by a flock; in flight, a rattling "che-e-e-e-e" or bell-like tinkling note. When threatened at nest, sometimes imitates calls of other bird species, e.g. American Mountain Thrush (*Turdus plebejus*). Sings with low lisping notes punctuated by louder "che chip" notes.

Habitat. Open montane habitats, such as secondary forest and pasture with scattered trees bordered by wooded ravines; 1800–3000 m.

Food and Feeding. Insects and small fruits; fruits include berries of fiddlewood (*Citharexylum*), the fuchsia *Fuchsia arborescens*, and the mistletoe *Eurya theoides*. Both insects and berries fed also to nestlings. Plucks berries while perched, and swallows them whole. Catches insects in air, often in long sallies from a high perch; when collecting food for nestlings, may twist and turn in air, capturing numerous insects before returning to nest.

Breeding. Apr–Jun. Monogamous; solitary or loosely colonial, may nest in groups of 2–5 pairs, defends small area around nest. Male begins construction of nest, both sexes contribute later, male feeds mate during building; nest a broad bulky open cup constructed primarily of pale grey beard-lichen (*Usnea*), bound with caterpillar silk or cobwebs, unlined interior smooth and hard (as though coated with plaster), outer diameter 11·4–12·7 cm, height 5–6·4 cm, inner cup 5·7–6·4 cm across and 4·1 cm deep; placed 2–18 m (average 7 m) up in fork or on stout horizontal branch of tree, sometimes in exposed location. Clutch 2 eggs; incubation by female, fed by male on or near nest, period 16–17 days; nestlings brooded by female, fed by both sexes with insects, also with increasing proportion of fruit as they grow older; chicks leave nest 24–25 days after hatching, by sidling out on branch, but may return to it for a day or two. Fledging success at 15 nests 27%; predators include Brown Jay (*Cyanocorax morio*).

Movements. Resident. During non-breeding season, ranges through forests and pastures in widely straggling flocks; occasionally wanders to lower elevations.

Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Common in appropriate habitats in mountain ranges of Volcánica Central and Talamanca. Not at any risk in most of range, but cause for long-term concern because of restricted distribution and small global population. Highland forests in Costa Rica and Panama have suffered widespread destruction as a result of burning, logging and agricultural expansion.

Bibliography. Angehr (2003), Anon. (1998b), Barrantes & Pereira (2002), Blake (1958), Carriker (1910), Hellmayr (1935), Ridgely & Gwynne (1989), Ridgway (1904), Skutch (1965a, 1965b, 1985b), Slud (1964), Stiles (1985), Stiles & Skutch (1989), Stotz *et al.* (1996).

On following page: 4. Phainopepla (*Phainopepla nitens*).

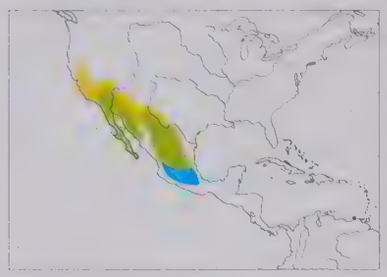
Genus *PHAINOPEPLA* S. F. Baird, 1858

4. **Phainopepla**

Phainopepla nitens

French: Phénopèple luisant **German**: Trauerseidenschnäpper **Spanish**: Capulinero Negro

Taxonomy. *Ptilogonys nitens* Swainson, 1838, Mexico.
Earlier suggestion of relationship with the turdine genus *Myadestes* contradicted by DNA–DNA hybridization data. Two subspecies recognized.
Subspecies and Distribution.
P. n. lepida Van Tyne, 1925 – SW USA and NW Mexico.
P. n. nitens (Swainson, 1838) – S USA (S Texas) S to S Mexican plateau.



Descriptive notes. 18–21 cm; 22 g. Slender, with prominent crest and long tail. Male is glossy black, with white wing patches (visible in flight or when wing extended); iris red; bill and legs black. Female has plumage grey, wing patch pale grey. Juvenile is similar to female but more brownish, with brownish iris; immature male varies from nearly entirely grey, as female, to black, as adult male, with intermediate plumages a mottled mix of grey and black. Race *lepida* has slightly shorter wing and tail than nominate. Voice. Contact call a mellow rising "wurp"; harsh "churr" note during chases and aggressive encounters. Song multisyllabic, with at least 14 different elements, including loudly whistled "wheedle-ah"; rambling quieter song with warbles, chucks and high-pitched whistles. When threatened at nest, imitates vocalizations of other bird species, including e.g. Red-tailed Hawk (*Buteo jamaicensis*), Northern Mockingbird (*Mimus polyglottos*), Northern Flicker (*Colaptes auratus*); when handled, loud distress calls and mimicry, recorded as imitating at least twelve species.
Habitat. In SW USA, occupies deserts in Oct–Apr and riparian woodland in May–Sept; highest densities in Sonoran Desert (Arizona) during winter. Abundant in desert washes with leguminous trees and shrubs such as palo verde (*Cercidium*), mesquite (*Prosopis*) and acacia (*Acacia greggii*) parasitized by desert mistletoe (*Phoradendron californicum*); summer riparian-woodland habitat dominated by oak (*Quercus*) and sycamore (*Platanus racemosa*), with fruiting shrubs such as redberry (*Rhamnus*) and elderberry (*Malosma laurina*). In Mexico, inhabits arid to semi-arid habitats with scattered trees and bushes, and riparian washes.
Food and Feeding. Small berries and flying insects. Nestling diet as adult's. Forages at variety of fruiting shrubs with small berries (less than 5 mm in diameter). Berries of desert mistletoe usually the single major food source from Oct to end Apr in desert; behaviourally and morphologically adapted to handle and digest these sticky berries, which are swallowed whole, then passed one by one from crop to gizzard, where skin removed; after 12-24 berries processed, all skins are ejected together. Fruits of redberry, blue elderberry (*Sambucus mexicanus*) and sumac (*Rhus*) eaten in coastal woodlands. Sallies from perch to capture insects, sometimes fluttering or changing direction erratically in pursuit of prey; sometimes flycatches aerially in groups. Rarely observed to drink water, even in desert.
Breeding. Nesting seasons in USA brief, coinciding with availability of fruit and insects, Feb–Apr in desert and May–Jul in riparian woodland (unknown whether same individuals breed in both habitats, but timing of movements consistent with this possibility); breeds Apr–Aug in Mexico. Monogamous, but mates usually not retained in successive years. In SW USA, territorial in desert (mistletoe berries and nest-sites simultaneously defensible), but loosely colonial, and defending only area immediately around nest, in riparian woodland (fruiting bushes and nesting sites spatially separated). Male presents female with berries or insects during courtship, also initiates nest construction at this time, and displays by approaching nest-site with fluttering flight; both sexes make rapid snapping noises with bill while shaping nest. Nest an open cup made of stems, small twigs, plant fibres and spider silk, placed 2–5 m above ground in fork of branches, on horizontal branch, or within clump of mistletoe, in palo verde, mesquite, acacia, willow (*Salix*), oak, sycamore, rarely in cactus. Clutch 2–3 eggs, rarely 4, typically 2 in desert but sometimes 3 in wet years, average clutch size slightly larger in woodland than in desert; may renest if first nest fails; incubation by both sexes, period 14 days; nestlings fed by both parents, contribution of male variable, chicks leave nest 20 days after hatching, may initially hop through vegetation and return to nest. Success highly variable, associated with differences in rainfall; some pairs in desert do not breed in drought years or when mistletoe crop fails. First breeding when at least 9 months old. Twenty-five percent of ringed breeders returned to study site within 2 years.
Movements. Short-distance migrant in USA; leaves desert late Mar to early May (timing dependent on food supply), arrives in riparian woodland from a few kilometres to 1200 km away in Apr and May, returns to desert in Oct; occasional stragglers remain in summer breeding range during winter. In Mexico, migratory in some regions; non-breeding grounds in C Mexico.
Status and Conservation. Not globally threatened. Fairly common. Estimates of numbers suggest that population declines have occurred, in USA at least, as a result of habitat loss associated with agriculture and development. Extensive areas of honey mesquite were abundant in lower Colorado Valley (California–Arizona border) during early 1900s, and were probably among the most important wintering and breeding areas for this species; only a single large stand now remains between Ehrenberg and Parker, in Arizona. In Mexico, occurs in 32 Important Bird Areas, including seven protected areas. Listed by "Partners in Flight" as a species in need of stewardship. An important disperser of mistletoe, influencing patchy distribution of plant parasite on host plants.

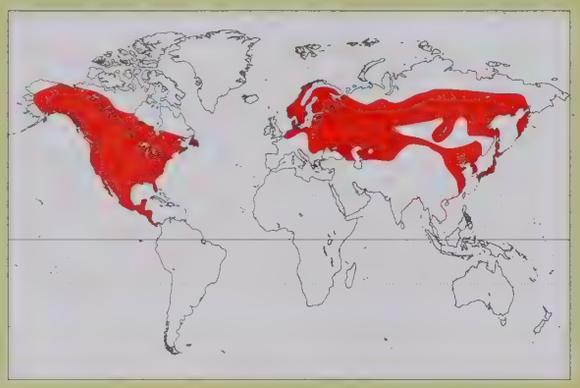
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Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family BOMBYCILLIDAE (WAXWINGS)



- Medium-sized songbirds with soft dense plumage, short broad bill, pronounced crest, black mask and coloured band on tail.
- 15–23 cm.



- Holarctic, ranging south into northern Neotropical.
- Deciduous and coniferous forests, mainly in broken or edge habitats.
- 1 genus, 3 species, 6 taxa.
- No species threatened, none extinct since 1600.

Systematics

The waxwings make up a small group of three closely related species. The major taxonomic debate surrounding this family has centred on the question of which, if any, of their presumed relatives should be included within its boundaries. Most authors have agreed that the waxwings are closely related to the silky-flycatchers (Ptilogonatidae), and the two groups have often been treated as subfamilies within the Bombycillidae. The Palmchat (*Dulus dominicus*) has also been regarded as a relative, and is sometimes included in the waxwing family. More tentatively, the Hypocolius (*Hypocolius ampelinus*) has been treated by some as another subfamily within Bombycillidae. Finally, some taxonomists have associated the wood-swallows (Artamidae) with the waxwings, but this association has not been generally accepted. There are few paleontological data on which to base conclusions. Specimens of *Bombycilla* are known, however, from Pleistocene deposits in California and Holocene deposits in Illinois, both in the USA.

DNA–DNA hybridization studies by C. G. Sibley and J. E. Ahlquist indicated that the silky-flycatchers and the Palmchat are rather closely related to the waxwings, and that they deserve separation only into tribes and not as distinct subfamilies. The silky-flycatchers appeared to be closer to the waxwings than is the Palmchat. Unfortunately, it was not possible to test whether the Hypocolius is genetically similar to this group, as DNA material of this species was not available. Sibley and Ahlquist's work also suggests that the waxwings are part of a larger group that includes the dippers (Cinclidae), the thrushes (Turdidae), the starlings (Sturnidae) and the mockingbirds, thrashers and allies (Mimidae), but that they are not particularly closely related to any of these families. Their data contradict the idea of an association with the wood-swallows, or any particular relationship with the solitaires of the genus *Myadestes*, an association suggested by their earlier studies of egg-white proteins. Recent analyses of gene sequence data from nuclear and mitochondrial genes have tended to support the pattern of relationships suggested by the DNA-DNA hybridization studies. The most detailed phylogenetic information available from this research confirms the close relationship of at least the silky-flycatchers to the waxwings, and suggests that the expanded waxwing family forms a sister group to a larger assemblage comprising the thrushes and dippers, as well as the closely related starlings and mockingbirds.

Among the three waxwings, there is one principal question with regard to systematics. Which two of the species are the most closely related? On the basis of a number of shared traits, such as similar body size, the markings on the primaries, a greyish belly and contrastingly coloured undertail-coverts, it appears likely that the Japanese Waxwing (*Bombycilla japonica*) and the Bohemian Waxwing (*Bombycilla garrulus*) share a more recent ancestor, while the Cedar Waxwing (*Bombycilla cedrorum*) is somewhat more distantly related. The possession of wax-like red tips on the secondaries of adults by the Cedar and Bohemian Waxwings (see Morphological Aspects) may appear to indicate a relationship between these two species, but Japanese Waxwings may, rarely, have small tips of this sort, suggesting that this trait has been secondarily lost in this species.

Three subspecies have been named for the Bohemian Waxwing and three for the Cedar Waxwing, all of them distinguished by subtle colour differences. These differences do, however, appear to be clinal in nature, at least in cases where the breeding ranges of the forms can be identified with a degree of accuracy. Indeed, it is often difficult to assign specimens to a particular subspecies with any confidence. Geographical variation within the Bohemian Waxwing involves only minor plumage differences. Furthermore, although the race described from central and eastern Siberia, *centralasiae*, is often noticeably paler, individuals from the eastern part of this range are often as dark as those of the nominate race, which breeds in Europe. In addition, the description of one of the races of the Cedar Waxwing, *aquilonia*, was based on wintering individuals of uncertain origin, and the slight colour differences ascribed to it do not seem reliable. While a total of five subspecies is currently recognized, three for the Bohemian Waxwing and two for the Cedar Waxwing, it could certainly be argued that none of these is worthy of recognition.

Morphological Aspects

Waxwings are medium-sized, slightly stocky songbirds, an appearance accentuated by the relatively short tail. They are nonetheless widely regarded as elegant birds in account of their upright posture, distinctive crest and sleek silhouette, the last due largely to the soft, dense and blended plumage.

The three species are similar in size. The Cedar Waxwing, at 15–18 cm, is the smallest, and the Bohemian Waxwing, with some birds as large as 23 cm, is the biggest. The Japanese Waxwing is perhaps slightly smaller than the Bohemian Waxwing, but closer in size to it than it is to the Cedar Waxwing. The sexes apparently

do not differ in size, although females may tend to be slightly heavier than males during the breeding season. Cedar Waxwings weigh on average about 33–34 g, while Bohemian and Japanese Waxwings typically weigh around 55 g.

Waxwings are short-necked and look somewhat plump, but they have fairly long and pointed wings which, when closed, extend about half-way down the rather short tail. The latter comprises twelve feathers of nearly equal length, although the folded tail may show a slight notch. The bill is short but fairly stout, with a convex culmen and gonys, and it has a slight hook and notch at the tip. Rictal bristles are rudimentary, even though it is not unusual for waxwings to engage in flycatching (see Food and Feeding). The gape is wide and deeply cleft to accommodate the larger fruits, such as cherries (*Prunus*), that are swallowed intact. The nostrils are almost concealed by short velvety feathers. The legs are short and are often not visible when the bird is perched, but the toes are strong. This arrangement is presumably useful in providing a secure grip when the bird stretches out, or even hangs upside-down, to reach fruit at the tip of a branch.

All three members of the family have a plumage that is predominantly of a soft vinous-brown colour, shading to grey in some areas, particularly on the flight-feathers. There is a black mask which begins in the velvety feathers near the nostrils and on the lores, continues back broadly to the eyes, and passes more narrowly over the eye and under the base of the crest. The throat is also marked by a black patch, and the larger size of this patch on the male Cedar Waxwing is perhaps the most reliable plumage difference between the sexes, although there may still be some overlap between them. Fine white lines set off the mask and throat patch to varying extents. All three species have a coloured band, bordered by black, across the tip of the tail. That of the Cedar and Bohemian Waxwings is bright yellow, whereas the tailband of the Japanese Waxwing is red. This band is apparently on average wider in older individuals, but it is subject to the effects of wear.

Both Bohemian and Japanese Waxwings have contrastingly coloured undertail-coverts, those of the former being cinammon-brown and those of the latter being of a brighter red. This area of the plumage is more weakly coloured on females, particularly in the case of the Japanese Waxwing. These two species also exhibit complex markings on their wings, although the details differ to some extent. Bohemian Waxwings have white tips on the primary coverts and on the outer webs of the secondaries, while the primaries have a yellow or yellow-and-white stripe along the outer webs and a white edge at the tip of the inner webs. Individuals in first-year plumage lack the white tips on the inner webs of the primaries, and the stripe on the outer web is usually paler or white. In the Japanese Waxwing, birds in the adult non-breeding plumage have only white or white-and-pink edging at the tips of the primaries, and lack a lengthwise stripe; immatures, however, have a bold white stripe along the primaries and no edging at the tip. In contrast to these two species, the wings of the Cedar Waxwing are mostly plain.

Juvenile waxwings differ from adults in a number of ways. They have a shorter crest, they lack the black throat patch, and the facial mask is less extensive. Their underparts are whitish with broad, blurry brownish streaks. Typically, they have no wax-like tips on the secondaries or, in the case of the Cedar Waxwing, only a few small ones, while the juvenile Bohemian Waxwing has a smaller number of such tips than do full adults.

Perhaps the most distinctive feature of the waxwings, and the one from which they have acquired their English name, is the red wax-like appendages that adorn the secondaries. These appendages are extensions of the feather shaft. They are flattened and are like an elongated teardrop in shape, with the pointed basal end inserted into the vane at the tip of the feather. The red coloration is due to astaxanthin, a carotenoid pigment. The frequency of these red tips varies among the three species. Almost all adult-plumaged Bohemian Waxwings have at least some wax-like tips on their secondaries, whereas about half of all adult-plumaged Cedar Waxwings lack these tips. In the case of the Japanese Waxwing, examination of specimens suggests that waxy tips are rare and occur only as small rudiments; instead, they are replaced by spots of bright red or pink on the tip of the outer vane of the secondaries, although these spots appear to be present primarily on males.





Much as waxwings are plump and stocky, their sleek plumage and debonair crests give them an air of elegance. This impression is accentuated by a neat black bib and mask, the latter swept upward behind the eye. Their wings are also crisply patterned, perhaps most impressively in the ***Bohemian Waxwing****, whose black flight-feathers are offset by yellow and white fringes. In adults, the secondaries are further adorned with elongated and flattened tips extending from the feather shaft. These unique appendages are bright red and appear waxy, giving the family its name.*

[*Bombycilla garrulus garrulus*.
Left: Staffordshire, England.
Photo: Mike Lane/NHPA.

Right: Scotland.
Photo: Peter Reynolds/FLPA]



All waxwings have a stubby bill, stocky body and short tail, making their wings seem incongruously long and powerful. This trait no doubt equips them for rapid and sustained flight, a useful adaptation for their relatively long foraging trips, as well as migrations, and the longer irruptive flights they occasionally make. In the ***Bohemian Waxwing****, the tail is tipped with golden yellow and the vent is rich chestnut. In all members of the family, the legs are so short and sturdy as to be almost invisible when the bird is perched. Again, this design is perfectly suited to an arboreal lifestyle, and provides the strong grip necessary when stretching or dangling from branches in pursuit of berries.*

[*Bombycilla garrulus garrulus*, Helsinki, Finland. Photo: Markus Varesvuo]

The wax-like tips appear to function as indicators of age and perhaps also, in the case of the Bohemian Waxwing, sex. Adult male Bohemians usually have 6–8 tips on the secondaries of each wing, the longest ranging from 6 mm to 9·5 mm, whereas adult females normally have 5–7, with the maximum length 3–7·5 mm. Similarly, in the first-winter plumage, males typically have 4–7 tips per wing, while females usually have 2–5. With the Cedar Waxwing, the age differences seem more pronounced, perhaps because this species, in contrast to its two congeners, lacks the primary pattern that distinguishes young and older individuals; the sex differences, however, are less clear-cut. The overall pattern is for adult-plumaged Cedar Waxwings to fall into one of two categories: those having no tips or occasionally a very few small appendages, and those having a substantial number of larger tips, usually 7–8 on each wing. There are no obvious sexual differences in the distribution of waxes. Both males and females typically have no wax-like tips in their first-winter plumage and usually have 7–8 tips as full adults. With Cedar Waxwings, at least, individuals tend to pair up with others of similar age, as indicated by the number of waxy tips that they possess. The appendages may function in facilitating this assortative mating, or it may come about through other means. In any case, pairs in which individuals possess a larger number of wax-like tips tend to have greater reproductive success than do those with fewer such tips (see Breeding).

Rarely, waxwings may have wax-like tips on the tail feathers, or even on the primaries. The possession of wax-like tips on the tail feathers appears to be more frequent among Bohemian Waxwings than it is among Cedar Waxwings, and may be most likely to occur in older males. Another abnormal plumage condition is the occurrence of an unusually coloured tailband. Cedar Waxwings exhibiting a bright orange tailband have been noted since the 1960s. This coloration is apparently due to the consumption of the fruits of Morrow's honeysuckle (*Lonicera morrowii*), which contains the red carotenoid pigment rhodoxanthin. This pigment is deposited along with the normal yellow carotenoids, but only if the fruit is consumed around the time of tail moult. In some areas, this is more likely to occur while nestlings are developing the tail feathers than it is during adult tail moult, so that individuals with an orange tailband tend to be in juvenile or first-winter plumage.

Adult bombycillids undergo one complete moult each year, this taking place between August and December or January. Juveniles moult at the same time, but they retain their flight-feathers and some of their wing-coverts during this moult. Individuals in first-winter plumage, therefore, have a reduced number of wax-like tips on the secondaries, as in the juvenile plumage.

Habitat

Although waxwings are often described as being birds of forested habitats, they are certainly not typical of large unbroken tracts of wooded land. Rather, they are found in clearings or open woodland, at forest edges and in successional habitats, areas where the fruits on which they depend are most abundant. While trees are important for nesting sites and as perches, most of the fruits consumed by waxwings are produced on shrubs and bushes, or on small trees. For the Cedar Waxwing, these requirements may sometimes be met by small patches of riparian trees and shrubs in otherwise arid habitats, by orchards or by suburban gardens.

The Cedar Waxwing is a more southerly breeder and is generally associated with deciduous forest, while the Bohemian and Japanese Waxwings are typically found in coniferous forest during the summer season. These associations are not strict, however, and are probably a consequence of the species' breeding ranges and the predominant forest types found there, rather than indicating any strong preference for particular tree species. Bohemian Waxwings usually nest in conifers such as spruces (*Picea*), firs (*Abies*) or pines (*Pinus*), but they may breed instead in birch (*Betula*) forest. Cedar Waxwings most often place their nest in a deciduous tree or shrub of some sort, but also frequently use small pines, junipers (*Juniperus*), white cedars (*Thuja*) and spruces as nest-sites. Little is known about the specific breeding habitat of the Japanese Waxwing, other than that this species is typically found in coniferous forest including cedars and larch (*Larix*), and that berries are generally plentiful in the area. While foraging, waxwings will at times travel some distance from trees in search of strawberries (*Fragaria*), blueberries (*Vaccinium*) or other fruits that occur in open areas (see also Food and Feeding).

In the winter months, waxwings will exploit an even broader range of habitats. During this season, Bohemian and Japanese



Outside the breeding season waxwings are usually found in closely knit flocks, containing anything from a handful of birds up to 3000, in the ***Bohemian Waxwing****. In much of Europe and North America, this species is an irregular winter visitor, sometimes arriving in considerable numbers. During invasion years, flocks descend on ornamental fruit-bearing trees and shrubs in suburbs and city centres. Oddly tame and dramatically patterned, they make an unfamiliar sight, and small crowds of onlookers often gather to watch them feed. This they do voraciously, consuming vast quantities of fruit, before adjourning to a nearby treetop to digest.*

[*Bombycilla garrulus garrulus*, Kuusamo, Finland. Photo: Markus Varesvuo]

Waxwings can frequently be found in mixed or deciduous forests, as well as in coniferous ones. All three species often occur in suburban and even urban settings when there are fruits available on ornamental trees, especially in parks and gardens. In some areas, Cedar and Bohemian Waxwings rely heavily on the berries of junipers during the winter, and Cedar Waxwings reach high densities in portions of the south-eastern USA where junipers are abundant. Cedar Waxwings can also be found at this season in arid habitats dominated by such plants as California sagebrush (*Artemesia californica*). They also regularly winter well into the tropics, although they become less numerous as one proceeds south from the USA (see Movements). In the tropics, they occupy a variety of edge or semi-open habitats but seem to favour highlands, especially at the southern extremes of the non-breeding range.

Little has been written about the roosting sites used by this family. Bohemian Waxwings have been noted in flocks in pines during winter, and Cedar Waxwings, after they have finished nesting, apparently gather in flocks to roost in dense trees. During the late summer, Cedar Waxwings sometimes join large mixed-species roosts in deciduous woods. In spring and early summer a tendency to prefer sites near water may be particularly evident, as they rely more heavily on insects at this time of the year and may be observed as they make flycatching sallies for emergent insects (see Food and Feeding).

General Habits

The Bombycillidae are well known for their habit of displaying a high degree of gregariousness throughout most of the year. Outside the breeding season they are almost always found in flocks. These vary in size, but are often quite large. Those of the Bohemian Waxwing are probably the greatest in size. Winter flocks of this species in western Canada, for example, contain, on average, around 200 individuals, but flocks of over 1000 are regularly reported and gatherings of up to 3000 have been observed. Cedar Waxwings also form very large flocks on occasion, but parties of this species more often include fewer than 100 individuals. Japanese Waxwings are more likely to be seen in small groups, occasionally numbering up to 50 birds in non-breeding flocks. Where different species overlap in range, each tends to flock with members of its own species, but smaller numbers of the less common species are often found within flocks of the more numerous species.

Waxwings are fairly agile when clinging to twigs and branches, but they are restricted to short hops when on the ground. They do not spend much time on the ground, but they do visit it in order to bathe, drink, or eat snow, or occasionally to pick up fallen fruit.

The long, pointed wings make waxwings capable of relatively fast flight. The flight speeds of Cedar Waxwings carrying food to the nest have been estimated at 34–50 km/h. Short flights are relatively direct, with steady flapping. Over longer distances flaps are alternated with glides, but without any pronounced dips in the flightpath. Because of the waxwings' pointed wings and short tail, flocks in flight often resemble those of Common Starlings (*Sturnus vulgaris*) at a distance.

Except during the courtship or nesting periods (see Breeding), intraspecific aggression appears to be very subdued or non-existent in waxwing flocks. Captive Bohemian Waxwings have been noted as maintaining individual distances of 2·5–5 cm, and this seems to accord with observations of wild-living individuals in most circumstances. Although waxwings sometimes feed alongside other frugivores, such as American Robins (*Turdus migratorius*), without any obvious aggression, at other times there are conflicts. Waxwings are more often chased by larger thrushes and other species, but they may occasionally initiate chases themselves. Bohemian Waxwings have been observed to chase smaller species, such as the Eurasian Bullfinch (*Pyrrhula pyrrhula*) and tits (Paridae).

The large flock sizes of waxwings apparently allow them to overwhelm the defences of other birds that attempt to defend fruiting trees. An individual waxwing that has been chased can settle and return to foraging a short distance away, while the aggressor turns its attention to other members of the flock. This strategy may fail, however, and a Northern Mockingbird (*Mimus polyglottos*) has been known to kill a Cedar Waxwing that was part of a flock attempting to feed at a defended tree.

Outside the breeding season, waxwings gather at communal roosts. These are usually in trees with dense foliage, but other sites, such as hedges, may be used, and Bohemian Waxwings have been noted to roost in the sheltered spaces of buildings, or on the ground beneath dense cover. Roosts are sometimes shared with other bird species, such as Fieldfares (*Turdus pilaris*), Ameri-



Many aspects of waxwing morphology and behaviour are geared to their consumption of fruit. The bill and gullet, for example, are broad enough to accommodate large drupes, which are always swallowed whole, as demonstrated by this ***Cedar Waxwing****. Frugivory places further demands because winter fruits are high in sugars but low in water and nutrients. This intake upsets their osmotic balance, forcing them to drink often. It also means they must eat a tremendous amount to survive, and eating a lot means defecating a lot. A large flock of waxwings produces a constant rain of droppings that can be heard pattering on the ground.*

[*Bombycilla cedrorum cedrorum*, Dryden Lake, New York, USA. Photo: Marie Read]

can Robins and New World blackbirds (Icteridae). In very cold conditions, the birds may roost in contact with each other, or even on top of other individuals.

Maintenance of the soft, dense plumage is achieved by frequent preening. Head-scratching is accomplished by bringing the leg up over the partially extended wing. Captive Cedar Waxwings have been noted to bathe frequently.

Voice

The fact that the Bombycillidae lack a loud advertising song makes them unusual among passerine birds. This lack of a strong song should not be too surprising, however, as the absence of territoriality in these species, together with the fact that males and females are already in close proximity in flocks at the start of courtship, relieves waxwings of the usual reasons for proclaiming their presence. Despite this, waxwings are often quite vocal and utter many subtle variations of their high-pitched whistles and trilled call notes.

The vocal repertoire of the Cedar Waxwing is perhaps the best known of the three species, and can serve as a reference for comparing the calls of the two other members of the family. The most frequent call type is referred to as the "Bzee Call", although this term refers to a broad category of calls that seem all to be variations on a basic structure. This structure is a high-pitched trill, typically of about 7–8 kHz in frequency, consisting of closely spaced notes. One variant of the bzee call, referred to as "Social Call 1" or the "Location Call", is the usual vocalization heard from perched or feeding flocks, and is often given also in interactions between members of a pair. Many of the other call types, although simply variations on the basic structure of the bzee call, are nevertheless recognizable and may provide a clue to the behaviour of the birds. For example, during nest-building or courtship, pairs often give soft buzzing trills, which have been referred to as the "Contact Call" or the "Courtship Note". The food-begging calls given by fledglings, or directed by the female towards her mate during incubation, are particularly loud and intense variants of the bzee call. Soft trills of variable structure, referred to as the "Warbling Call", are occasionally given by waxwings during incubation or while quietly perched.

Other call types of the Cedar Waxwing take the form of high-pitched hissing whistles of relatively constant frequency, and can be collectively referred to as "Seee Calls". The most frequently heard variant in this category is the usual flight call of this species, known as "Social Call 2" or the "Flock Call". As well as being given in flight, it may be heard within perched flocks, and an increase in the frequency and intensity of these calls signals the imminent departure of the flock. The "Distress Call" has a similar structure, but it drops sharply in pitch at the end.

The most common calls of the Bohemian Waxwing are high-pitched trills that are similar in structure to the bzee call of the Cedar Waxwing. These trilled calls seem to dominate the repertoire of Bohemian Waxwings even more than is the case with the Cedar Waxwing, as they are frequently given in flight, as well as by perched individuals. The most familiar variation of these trilled calls has again been named the "Social Call 1". In comparison with the corresponding call of Cedar Waxwings, it is slightly lower-pitched, with a frequency of 6–7 kHz, and the individual notes are longer, with a drop in pitch during each note, producing a "silvery" and somewhat musical trill. Variations on the standard trilled call are used in interactions between mates. Bohemian Waxwings have been described as having a "song", but there is no evidence that it serves the territorial or mate-attraction functions of most passerine songs. It appears to consist of a series of trills resembling social call 1, with varied wheezing or scraping notes interspersed within it. This vocalization may perhaps be similar to the warbling call of the Cedar Waxwing. Pure-toned calls are also occasionally given by Bohemian Waxwings, but the context and function of most of these are unclear.

The vocal repertoire of the Japanese Waxwing is not very well known. This species frequently emits trilled calls similar to those of the Bohemian Waxwing, although these are shorter than the latter's social call 1. Japanese Waxwings also give descending pure-toned "pee" and "peeeh" calls of varying length.

Food and Feeding

The members of this family are among the most strongly frugivorous of birds. This reliance on fruit as a staple food is especially surprising, however, as the fruits that they most fre-

quently consume are high in sugars but low in other nutrients. Sugary fruits appear to be the predominant food item whenever they are available in sufficient quantity, and most aspects of the life history of these birds seem to be adapted to the characteristics of this food source.

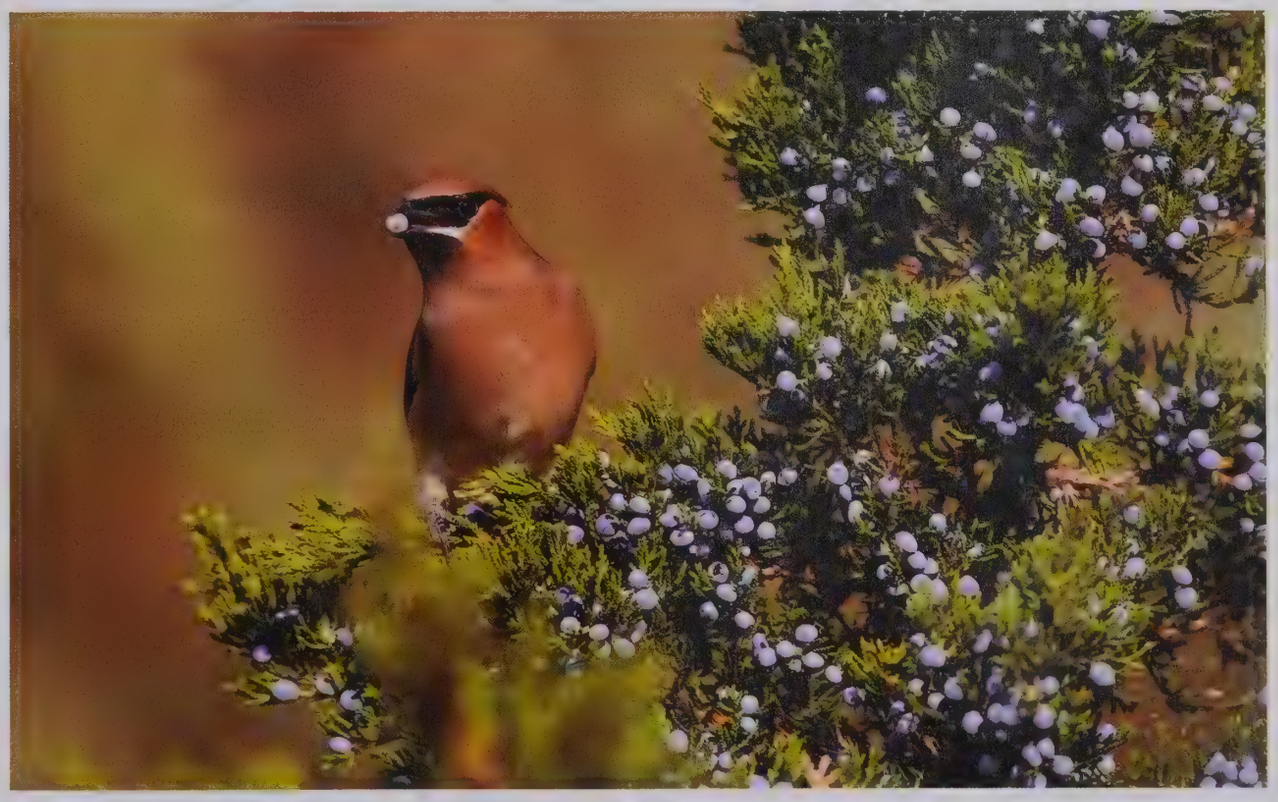
The diet of the Cedar Waxwing has been studied in some detail, and it has been found that fruit constitutes about 84% of the food volume consumed throughout the year. During the months of October to April the proportion of fruit in the diet approaches 100%, and the only month in which it was found not to make up the majority of the diet was May. At this time of the year, when fruit is scarce, Cedar Waxwings turn to flowers for a large proportion of their diet; flowers accounted for 44% of their food in May. Both petals and stamens are consumed. At least on some occasions, as, for example, when feeding on apple (*Malus*) blossoms, the petals are clearly targeted and the stamens left untouched. At other times, stamens appear to be deliberately eaten.

Insects, and occasionally other invertebrates, are a significant supplement to the diet of Cedar Waxwings. They make up about 40% of the diet during May, and are only slightly less important in June and July, but their importance decreases in August and September. The flycatching behaviour of waxwings is very conspicuous and is frequently noted in the literature, but the obvious visibility of this activity may lead to incorrect assumptions about its relative importance in the foraging behaviour of these birds. Although Cedar Waxwings do take many flying insects, the largest component of their arthropod consumption is beetles (Coleoptera), especially scarab and leaf beetles (Scarabaeidae and Chrysomelidae), and these are probably often captured by gleaning. Other frequent insect prey include hymenopterans, especially ants (Formicidae), lepidopterans, including many larvae, dipterans such as craneflies (Tipulidae), and homopteran bugs, especially scale insects (Coccoidea) and aphids (Aphididae).

The diets of the two other bombycillids appear to be similar, at least in broad outline. All waxwings feed heavily on sugary fruits, especially in autumn and winter, and also regularly consume arthropods during the summer. There is, however, some uncertainty as to the importance of insects in the diet of Bohemian and Japanese Waxwings. Some published statements intimate that insects make up the bulk of the Bohemian Waxwing's food during the summer months, but the limited quantitative data available suggest that this is incorrect, and it may be that casual observations have been biased by the conspicuousness of flycatching activities. The stomach contents of 26 individuals collected during May–September in southern Kareliya, in extreme north-west Russia, consisted largely of fruits of *Vaccinium*, *Sorbus* and *Rubus*; insects were consumed mainly in June, and beetles made up the majority of these. Leaf buds of aspen (*Populus*) and flower buds of willow (*Salix*) were also recorded in small quantities in this study. Other observations of summer foraging do not establish the relative proportions of plant and animal material in the diet, but the fact that nestlings are fed with fruit, as well as insects, and the apparent importance of fruiting shrubs in descriptions of this species' breeding habitat would appear to indicate that fruit is quite significant at this season.

Even less information is available on the summer diet of Japanese Waxwings, but it is again suggested that this species feeds on flying insects. Juveniles, at least, are known to feed on blueberries, and it seems likely that breeding adults would also utilize fruit during the summer, as do both Cedar and Bohemian Waxwings.

Bearing in mind the extensive range of this family, which breeds across almost the entire northern Holarctic Region and in the winter months is found as far south as the northern Neotropics, it is not surprising that the list of fruit species consumed is very wide. Certain species or genera do, however, seem to be particularly important in waxwing diets. Serviceberries (*Amelanchier*), strawberries and mulberries (*Morus*), being some of the first fruits to become available in early summer, are significant foods. Midsummer fruits that are important to breeding waxwing include raspberries (*Rubus*), blueberries, cherries, and certain species of dogwood (*Cornus*). In the autumn and winter a broader range of fruit is consumed. Juniper berries are eaten by all three waxwings, but they seem to be especially important to the Cedar Waxwing, as they make up half of that species' winter diet. This reliance on juniper berries may have been even more pronounced before the planting of ornamental shrubs provided an abundance of alternative foods, but Cedar Waxwings still tend to spend the winter months preferentially in areas with high densities of juniper. Bohemian Waxwings, especially in Eurasia, are noted for their winter consumption of the berries of rowan, or mountain-ash (*Sorbus*), and these fruits are also popular with Cedar Waxwings. Japanese Waxwings are reported as frequently feeding on mistletoe berries (of the genus *Viscum*). Other important fruits for waxwings include those of hawthorns (*Crataegus*), rose hips (*Rosa*), honeysuckle (*Lonicera*), crabapples (*Malus*), cotoneaster (*Cotoneaster*), holly (*Ilex*) and firethorn (*Pyracantha*).



By measuring the volume of different items in the diet, it has been calculated that 84% of food consumed by the ***Cedar Waxwing*** *is made up of fruit. This figure is an average of monthly intake throughout the year, and conceals some fluctuations in dietary composition. Between October and April the proportion of fruit in the diet approaches 100%, but it drops below 50% in May. Towards the latter part of the spring, buds and flowers rise briefly to prominence, and insects are relatively important from May to July. When waxwings eat flowers they target petals and stamens, while insects are usually caught in flight, or plucked from branches.*

[*Bombycilla cedrorum cedrorum*, Jamaica Bay, New York, USA. Photo: Arthur Morris/ Birds as Art]



Waxwings build bulky cup-nests in trees or bushes, using twigs, grasses and roots to form the structure. Nest construction is carried out by both sexes, often in unison, although females tend to contribute more effort, at least during the first breeding attempt. This ***Cedar Waxwing*** *nest is balanced on the horizontal fork of a branch, a typical location for the species. Positioning varies, however, with nests reported 1-15 m above the ground, sometimes in an upright fork, and placed in a range of trees or shrubs, including pines, junipers, apples, maples and oaks.*

[*Bombycilla cedrorum cedrorum*, near Thunder Bay, Ontario, Canada. Photo: Wayne Lankinen/ DRK]

Aside from the usual food items of fruit, arthropods and flowers, waxwings have been recorded as consuming a variety of other items as occasional supplements. Buds are eaten by Bohemian Waxwings with some regularity, especially during the winter and early spring. This species also consumes a variety of seeds, such as those of birches (*Betulus*), alders (*Alnus*) and spruces (*Picea*), and both it and the Cedar Waxwing sometimes feed on sap dripping from damaged trees. Bohemian Waxwings have also been reported to eat small shoots and leaves, mosses and lichens, and, rarely, to take table scraps from feeding stations.

In the winter months, waxwings frequently drink water or eat snow. It has been suggested that the sugars in dried fruits create a high osmotic load, tending to dehydrate the birds. This is not likely to be a problem in summer, when most of the fresh fruit consumed has a relatively high water content.

The feeding techniques used by bombycillids are fairly straightforward. Fruits are usually obtained while the bird is perched, and it plucks these either by reaching up to another branch or by reaching down to a fruit hanging below. The short but strong legs allow the waxwing to dangle below a branch, occasionally hanging upside-down, to pluck fruits. In addition, these birds will sometimes hover briefly in order to get at dangling fruit. Insects are obtained both by gleaning from vegetation and by flycatching. The aerial sallies made by waxwings are generally slower and less agile than are those of the specialized flycatchers, such as the muscicapids and the tyrannids, but they do manage to capture some strong-flying prey, including dragonflies (Odonata).

Waxwings travel significant distances each day while foraging for fruit, and this mobility seems likely to have substantial consequences in terms of the seed dispersal of the plants upon which they feed. Breeding Cedar Waxwings frequently travel 1 km from the nest when collecting fruit with which to feed the nestlings, and occasionally they carry fruit gathered at sites up to 2 km away. The daily distances travelled by waxwings at other seasons have not been measured, but they appear to be substantial. Thus, it is probable that waxwings disperse seeds into new areas to a greater extent and more effectively than do many other frugivorous birds that are territorial or confine their foraging to a small area.

Breeding

Generally speaking, waxwings breed later in the year than do most passerines, an adaptation which reflects their dependence on fruit during this season, even for the purpose of feeding the young. Cedar Waxwings do not usually begin egg-laying until early June, and laying continues into the first week or so of August. Exceptionally, active nests have been reported as late as early October. The majority of Bohemian Waxwings, too, nest relatively late in the year, with egg-laying typically initiated in mid-June. The forming of pairs, however, can begin much earlier. For example, Cedar Waxwings can be seen "courtship hopping" in winter flocks from March, or even before then, although this activity intensifies in late spring. Bohemian Waxwings have been reported as displaying some courtship behaviour as early as the end of November, but courtship can also last into the second half of June.

Courtship involves a series of exchanges of a food item between the male and the female, with the individual currently holding the food first hopping away and then returning to the side of the other bird. This behaviour has been referred to as "courtship hopping" or the "gift-passing ceremony". It is usually initiated by the male, which brings a small item of food to the female and offers it to her, but sometimes an inedible item is substituted or the passing is merely simulated, with the two birds touching bills but not exchanging any item. After a few exchanges, sometimes twelve or more, the display typically ends when one individual, usually the female, consumes the item. Copulation is normally preceded by courtship hopping. Most such displays, however, are not followed by copulation, as waxwings copulate only infrequently.

Although waxwings are often regarded as gentle and non-aggressive birds, the male does endeavour to keep other males away from his mate as the time of egg-laying approaches. At this stage, threats and short chases are not uncommon. The male threatens rivals either by using an upright posture or by leaning forwards while holding the bill open. Cedar Waxwings have also been observed during the breeding season to engage in what appear to be aggressive chases, in which several individuals fly in a rapid and twisting pattern among trees and shrubs, seemingly chasing the leading bird. Such flights may end with one individual flying at several others and apparently trying to drive them off. The significance of such flights is unknown, but it is possible that they could involve a male that is attempting to defend his mate from the attentions of other males.

Observations indicate that bombycillids are at least seasonally monogamous. In the case of Cedar Waxwings, which are often double-brooded, this usually means that the members of a pair will remain together for both nesting attempts. In fact, in terms of the work required of the parents, there is often substantial temporal



Waxwings are at least socially monogamous during the breeding season, although males invest considerable effort guarding their mates during the fertile period, suggesting that extra-pair copulations do occur. The female takes sole responsibility for incubation of the eggs and brooding the young nestlings, but the male nonetheless plays an important role: he diligently delivers food to his mate during this period, allowing her to remain at the nest for 95% of the daylight hours. In the ***Cedar Waxwing****, the eggs (usually five in a clutch) are incubated for about 12 days before they hatch. At first, the nestlings are blind and naked, with colourful gapes. The mouth-lining is bright red, as can be seen here, with a violet-blue band at either side, and the tongue is purplish. By the time they reach five days of age, the nestlings have all their major feather tracts covered with pin feathers, which break from their sheaths around nine or ten days after hatching. After 14-18 days, the brood fledges.*

[*Bombycilla cedrorum cedrorum*, Adirondack Mountains, New York, USA. Photo: Robert A. Lubeck/ Animals Animals]

overlap between the two attempts, and the male's continuing assistance in feeding both the fledged first-brood young and the incubating female is probably vital in enabling the pair successfully to raise two broods. Insufficient information is available to determine whether pair-members re-mate in subsequent years.

Waxwings seem not to defend a breeding territory, although, as already mentioned, a male will sometimes exhibit mate-guarding behaviour and will drive off other males that approach his mate. There appears also to be a need to defend the nest from conspecifics on occasion, as Cedar Waxwings, and probably the two other bombycillids, frequently steal nest material from active nests of their own species, as well as from nests of other bird species. Apart from these instances, however, waxwings seem to tolerate conspecifics near the nest, and it is not unusual for several pairs to end up nesting in close proximity to one another. For Cedar Waxwings in the USA, for example, 13 nests in Michigan and eight nests in North Carolina were spaced at densities corresponding to, respectively, 14·1 nests/ha and 44·4 nests/ha. Bohemian Waxwings have also been observed to nest in an almost colonial fashion at times, with clusters of 6–12 nests within a small area. Most pairs, however, nest solitarily. Clusters of nests probably result from a local abundance of favourable nesting sites, rather than reflecting a social attraction between breeding pairs.

Nest construction is carried out by both sexes, the two usually travelling together to and from the nest-site. The female may bring more material, and she does more of the actual construction work, but the male does participate in the task. In fact, in the case of second nests, the male may be responsible for the majority of the building work. Waxwings build bulky open cup-nests, most of the structure being typically formed from small twigs, grasses and roots. The limited information available on the nests of the Japanese Waxwing suggests that this species favours larch twigs. Cedar Waxwings sometimes incorporate pieces of string, strands from fishing nets or other artificial material into their nests, and they characteristically "decorate" them with the flowering heads of grasses or catkins, which dangle below the structure. Bohemian Waxwings often use lichens or horsetail (*Equisetum*) stalks in the exterior covering of the nest, and may employ feathers and fur in the lining.

The nest is normally placed in a tree or bush. Cedar Waxwing nests are most often situated in the fork of a horizontal branch, but those of the Bohemian Waxwing are typically saddled on a branch and close to the main trunk. The rather few nests of Japanese Waxwings that have been found have been placed at heights of 8–10 m in larch trees. Similarly, Bohemian Waxwing nests are usually built in conifers, including spruces, firs and pines, at heights ranging from 1 m to 15 m. The Cedar Waxwing seems to be less strictly selective in its nest-site requirements and is known to use a fairly broad range of sites, often choosing a dense young tree or shrub, but also regularly using high branches in more sparsely vegetated trees. The height at which it places its nest varies in accordance with the particular site, and ranges from 1 m to 15 m, although the majority of nests are below 4 m. Tree species that are frequently used by Cedar Waxwings include junipers, apples, maples (*Acer*), oaks (*Quercus*) and pines, and this species will occasionally place its nest in a vine, such as a species of *Vitis*, that is supported by a tree.

For all three waxwings, the normal clutch size appears to be five eggs. Cedar and Bohemian Waxwings regularly lay clutches of between four and six eggs, but they sometimes lay as few as two. The eggs of these two species are very similar in colour. They are pale bluish-grey, with slightly purple tones, and are sparsely marked with grey or blackish blotches of varied size and darkness. The dimensions of Cedar Waxwing eggs are approximately 25 × 15 mm, while the average size of those of Bohemian Waxwings is 25 × 17 mm. No description of the eggs of Japanese Waxwings is available.

The Bohemian and Cedar Waxwings, the breeding behaviour of which has been reasonably well studied, appear to be similar with regard to the respective roles of the sexes in breeding duties. The female alone is responsible for incubation, but the male regularly delivers food to his mate during incubation and for the first few days of nestling care. The male may take food directly to the nest or he may perch near the nest; in the latter situation, the female approaches the male and produces loud begging calls, before being fed. The male Cedar Waxwing feeds his mate at an average rate of more than once per hour. He is able to regurgitate substantial numbers of berries at each visit, and his feeding efforts appear to satisfy most of his sitting partner's requirements, allowing her to remain at the nest for 95% of the daylight hours.

Incubation requires about 12 days in the case of the Cedar Waxwing, while the incubation period of the larger Bohemian Waxwing is usually 13 or 14 days. On hatching, the pink-skinned nestlings are blind and naked. The mouth-lining is bright red, with violet-blue bands laterally, and the tongue is purplish. The young of Cedar Waxwings exhibit pin feathers in all of the major feather tracts by the time they reach five days of age, and these feathers burst out of their sheaths around the ninth and tenth days. There is very little information on the development of Bohemian Waxwing young. The chicks of both species generally remain in the nest for 14–18 days, the duration of the nestling period being influenced to some degree by the weather and by disturbances at the nest.

The nestlings are fed by both parents. During the first few days of their life, while the female is still brooding the young almost constantly, the male provides most of the food for the family. In these early food deliveries the male normally feeds the female first, and she then transfers some of the food to the nestlings. During the first couple of days the young are fed mostly with insects, but after that stage the diet is predominantly fruit. Indeed, Cedar Waxwings have been observed to feed their young with fruit even on the very first day of the nestlings' life. Observations of this species reveal that the female's participation in brood-feeding increases rapidly from about the fifth day to the tenth day, but subsequently declines. It is remarkable that the nestlings manage to sustain rapid growth on a diet that contains only a low percentage of protein.

After fledging, young Cedar Waxwings are fed by the parents for a further 6–10 days, although the fledglings start to obtain significant quantities of food for themselves about three days after leaving the nest. When a pair makes an attempt at producing a second brood, the feeding of the young from the first nest is the task solely of the male. Young Cedar Waxwings often form flocks with juveniles from other nests shortly after reaching independence.

Among Cedar Waxwings, there is a strong tendency for yearling birds to pair up together, while older individuals usually have mates of a similar age to their own. The proportion of yearlings observed in the breeding population is similar to that expected in the population as a whole, indicating that most or all of the waxwings attempt to breed at one year of age. It has been suggested, on the basis of observations of "nomadic" flocks of non-breeding immatures, that some Bohemian Waxwings do not breed at one year, but it is not clear how such flocks could be distinguished from breeding birds. Cedar Waxwings frequently form small flocks during foraging trips away from the nest, and, as mentioned previously (see Food and Feeding), they may travel up to 2 km from the nest-site while gathering food.

Movements

Waxwings are renowned for their winter irruptions, which can take them in large flocks to areas where they do not normally occur. They show low levels of philopatry to their breeding areas, and they wander extensively within their non-breeding ranges. These habits are reflected in the use of the modifier "Bohemian" for one species and the frequent description of all three species as being nomadic. There is also, however, a strong degree of regularity and predictability in their movements, and in the timing of these, that should not be obscured by the use of generalizations such as "erratic" and "nomadic".

All three members of the family engage in annual migrations of short to moderate distance, with either the entire breeding range or a large portion of it being abandoned during the winter period. Migrants typically travel in flocks of varying sizes, and movements are often conspicuous during the daylight hours. The fact that Cedar Waxwings are occasionally found dead after having flown against towers and similar artificial structures during the night-



*Like its congeners, the **Bohemian Waxwing** feeds its nestlings a diet of fruit and insects, most of which is regurgitated. The male provides food during the first days after hatching, delivering items to the incubating female. She takes her share then passes the rest to her brood. At first they are given small insects, but fruit soon makes up the bulk of the diet, even a few days after hatching. This is particularly noteworthy, as most frugivorous birds feed their offspring with invertebrate or vertebrate food until they fledge, thus ensuring all the proteins and minerals necessary for growth and development are supplied.*

[*Bombycilla garrulus garrulus*, Lapland. Photo: R. W. Powell/ Windrush]

time does, however, indicate that some nocturnal migration may also occur. Movement away from breeding sites appears to begin soon after breeding has been completed, although these initial movements may be of shorter distance and not clearly oriented in a particular direction. Cedar Waxwings begin to depart from the northern sections of the breeding range from as early as late August through to October. The departure of Bohemian Waxwings from northern parts of the range, such as interior Alaska and Russian Lapland, usually commences in September, but some individuals may linger, depending on the abundance of berries.

The first of the Cedar Waxwing migrants arrive in some of the northern parts of their wintering range in September, but the species does not normally reach the southern USA until October or November, and may not be seen in the southernmost portions of the non-breeding range, in Central America, until December. Occasionally, however, waxwings move south in more rapid fashion, appearing in Texas by August or in Mexico by September. Similarly, Bohemian Waxwings typically arrive in the wintering areas between October and November, but the numbers at the southern extremes of the range may continue to increase until February, indicating ongoing migration. When large irruptive movements of this species occur, the first individuals sometimes arrive earlier than normal; in Scotland and in southern Saskatchewan, on the Canada–USA border, for example, the vanguard can be observed by late September. Japanese Waxwings, which breed in south-east Russia and adjacent extreme north-east China, usually reach wintering quarters in Japan in late November, but they have been recorded there as early as the beginning of October.

Unlike many migratory birds, waxwings appear not to settle into any one location for an entire winter. Rather, they move on after having depleted local crops of fruit, and they may continue their movements throughout the winter months. Recoveries of Cedar Waxwings ringed during the summer and early autumn demonstrated that the birds did not reach the greatest distances from the ringing location until February. Waxwings may be present throughout the winter in some areas where fruit is available in abundance during this season, but there may still be turnover among the individuals present in the local flocks. Ringing studies in Saskatchewan during the non-breeding season have shown that Bohemian Waxwings ringed in mid-January had mostly departed before March, but those ringed in late February were frequently recaptured into April.

Further, waxwings are known to use wintering areas widely separated geographically from those used in a previous year. For example, two Cedar Waxwings ringed during one winter in California, in the south-west USA, were recovered in subsequent winters in Alabama, about 3100 km away in the south-east USA. Similarly, a Bohemian Waxwing that had been ringed in the non-breeding season in Poland was recovered in the following winter in eastern Siberia, about 5500 km distant, and another individual of this species, ringed in British Columbia, in south-west Canada, was recovered in the next year in South Dakota, about 1200 km to the south-east, in the north-central USA.

Despite having a relatively late breeding season, from June onwards (see Breeding), Bohemian Waxwings usually leave their wintering areas at an early date. Northward migration probably begins in February and intensifies in March in many parts of this species' range, although it can be difficult to distinguish the beginning of return passage from winter wandering. The migrants arrive in northern sections of the breeding range in April and early May, but it is not uncommon for stragglers to be found still far to the south at this time, especially after major irruptions. Japanese Waxwings, too, seem to move north at a relatively early date. They are usually gone from most of Japan by early April, with a few stragglers sometimes lingering until the middle of May.

In contrast to its two congeners, the Cedar Waxwing is a late migrant and does not usually move northwards out of the wintering region until May. In the northern portions of its wintering range in the USA, in Massachusetts, Ohio and Illinois, for example, an increase in numbers is often evident in March and April. This has sometimes been interpreted as reflecting an early migratory surge, but it seems that these birds do not move much farther north at this time. It may be that these sightings represent wandering winter flocks that temporarily move north as the temperature moderates. Large numbers of migrants pass through these areas during the middle and end of May, and the northern parts of the species' breeding range are not fully occupied until some time in June. Stragglers linger as far south as Costa Rica into May, and can still be seen in the southern USA in June.

Cedar Waxwings show little philopatry to the areas where they were hatched or where they previously bred. Only about 4% of ringed individuals return to the precise area where they were captured during a previous breeding season, this being a much lower percentage than those found for most passerine birds. In contrast to their winter wanderings, however, there is no good



*This recently fledged **Bohemian Waxwing** is begging its overworked parent for more food. Fledglings tend to be fed for around 6-10 days after leaving the nest, although they can forage adequately for themselves after about three days. Shortly after reaching independence, different broods of waxwings coalesce to form flocks of juveniles.*

[*Bombycilla garrulus garrulus*, Kuusamo, Finland. Photo: Hannu Hautala/Bios]

evidence that they ever breed in widely separated areas in different years. For individuals ringed and recovered during the months of June to October, the average distance between the original capture site and the recovery location was 222 km. This figure is certainly not a true representation of the distance between breeding areas used by these individuals in different years, as many of these waxwings would already have departed from their breeding areas in October, and others would still be on spring migration in early June. It does suggest, on the other hand, that Cedar Waxwings typically nest within 200 km of previous breeding sites, and probably much closer to them.

Comparable data are not available for the Bohemian and Japanese Waxwings. Although there are indications that the former may occasionally breed farther south than it normally does, and that breeding populations are variable at specific sites, it nevertheless seems that the distribution of breeding birds is relatively constant across the main range, and that the species is not nearly so erratic in its choice of breeding areas as are some other passerines, such as crossbills (*Loxia*).

All three of the Bombycillidae are to some degree erratic in their non-breeding distribution, sometimes occurring well beyond their normal range. This trait seems to be most pronounced in the Bohemian Waxwing, which is famed for its periodic winter irruptions. These invasions are notable both for the numbers of individuals involved and for the distances travelled. Perhaps the best-documented irruption in Europe is that which took place in 1965–66, when large flocks of this species reached western and central parts of the continent and smaller ones were recorded in the Mediterranean region. An idea of the numbers involved in this massive irruption can be gained from observations made in south-west Germany, where an estimated 34,000 individuals were present in the Baden-Württemberg region alone. During a major irruption of this species in North America in 1908, observers in Iowa, in the north-central USA, reported that the waxwings arrived in a dense flock that was 60–90 m wide and passed overhead for 2–3 minutes. During invasion events in North America, Bohemian Waxwings have appeared as far south as southern California, northern Texas, north-west Arkansas and Virginia, and in the winter of 2001–02 a party of five was recorded in Bermuda, in the western Atlantic Ocean. In the Old World, likewise, they have been recorded as far south as northern Algeria, Malta, Cyprus, south-west Iran, southern Pakistan, Nepal and Taiwan.

Irruptions of Bohemian Waxwings appear not to be correlated with weather conditions and are presumed to be caused generally by food shortages, although this has not been rigorously studied. Even so, observations certainly indicate that the large-scale invasion in Europe in the mid-1960s was triggered by the combination of a large waxwing population and an inadequate food supply in northern regions, and a similar coincidence of events has been noted in other irruption years. It has been suggested that irruptions in Eurasia might tend to occur at ten-year intervals, but there seems to be little evidence to support this; following an invasion, the subsequent one may occur much sooner than this, even in the very next winter.

In North America, there is no apparent periodicity in the timing of invasions, but in some regions of south-eastern Canada and the north-eastern USA the frequency of occurrence of Bohemian Waxwings seems to have increased in recent decades. In Wisconsin, Massachusetts and Nova Scotia, for example, winter records of this species have become more frequent over this period. This change may reflect an apparent expansion of this species' breeding range into the north-eastern part of the continent (see Status and Conservation).

The Cedar Waxwing exhibits a far less marked degree of irruptive behaviour, although its appearance in different parts of the non-breeding range can be irregular, being dependent on food availability. It is an annual visitor as far south as Costa Rica, but is less regular in the south of Central America and in the West Indies. Vagrants are reported sporadically in the northern part of South America. Of particular interest is the fact that this species has occurred also on the eastern side of the Atlantic Ocean, where it has been recorded at least twice. The appearance of a vagrant in Iceland in April 1989 followed reports of exceptionally large numbers in north-east North America during the preceding months, and the discovery of a Cedar Waxwing in England in February 1996 coincided with a huge invasion of Bohemian Waxwings in that country.

Relationship with Man

Waxwings are viewed by most people as a particularly attractive component of the avifauna, and the activities of these birds generally result in few conflicts with man. Both Bohemian and Japanese Waxwings breed in areas with low human population densities, which reduces the potential for problems. By the time these birds move into more densely populated areas in the autumn and winter, commercial fruit crops have already been harvested and the waxwings feed mostly on berries and other fruits of no commercial value. Japanese Waxwings have been reported to cause some damage to the buds of kiwifruit (*Actinidia*), but such incidents are probably uncommon.

Cedar Waxwings, however, have a range that overlaps much more extensively with areas of active agricultural activity, and in some situations they can be responsible for significant crop damage. They consume primarily smaller fruits, such as blueberries, grapes and serviceberries (see Food and Feeding). Growers have reported bird damage to their crops of 10–60%, although it is quite possible that American Robins, icterids and other species are responsible for a substantial proportion of these losses. The most effective control method for crops such as blueberries appears to be netting, although this is a relatively costly measure.

Waxwings clearly have some special appeal. In much of Europe and Asia, they are no more than occasional visitors, and in years of irruptions (see Movements), when large numbers of Bohemian Waxwings invade areas farther south than their normal non-breeding quarters, they attract the attention of many birdwatchers and even sometimes of the media. Newspaper and television reports seem to delight in these strange birds that are feeding on berries in suburban and urban gardens and parks.

Status and Conservation

The three species of waxwing vary considerably in their population size and probable conservation status. The Cedar Waxwing is a very common species within its core breeding range, and it has an extensive distribution. In breeding-bird atlas projects undertaken in Ontario, Quebec and the Maritime Provinces of Canada, and in New York, in the USA, this species was in each case found to be among the top 20 bird species with regard to the number of atlas squares in which it was recorded. Roadside counts used in the North American Breeding Bird Survey revealed that Cedar Waxwings increased significantly over the period from 1966 to 2002, the numbers rising at an average annual rate of 1·3%. This increase was evident throughout most of the species' range, with the exception of portions of the Pacific coast, the northern prairies and other isolated pockets. The population as a whole, however, seems to have remained fairly stable since 1980.

Bohemian Waxwings appear to breed at lower population densities than do Cedar Waxwings. Although figures of up to 35·6 birds per square kilometre have been recorded in Russia, a more typical breeding density is of fewer than ten individuals per square kilometre, even in preferred habitats. Despite these low densities, the very extensive breeding range of the Bohemian Waxwing results in a very large population size for the species as a whole. Its population seems to be stable in the European part of its range, and numbers are stable or slightly increasing in North America. In the latter continent, not only has this species become more frequent as a winter visitor in south-east Canada and the north-east USA (see Movements), but there are also indications that it may now be nesting beyond its traditional range. In Canada, evidence of breeding in northern Ontario was first obtained in 1964, individuals in breeding condition were collected in northern Quebec in the 1970s, and there have been a number of recent sightings of summering Bohemian Waxwings in Labrador.

Of the three members of the Bombycillidae, the only one for which there is concern with regard to its conservation status is the Japanese Waxwing. The limited range of this species and its apparently small population raise the possibility that it could become globally threatened if it suffers any major perturbations. As a consequence, it has been placed by the IUCN in the conservation category of Near-threatened. While there is no obvious indication that the Japanese Waxwing population is declining, the clumped and rather sporadic distribution of waxwings, especially in winter, makes it difficult to monitor population trends accurately. More information on this species' precise breeding-habitat requirements, and potential changes in its environment, would be valuable, as also would reliable indications of any trends in its global numbers.

The impact of human beings on waxwings is difficult to assess, but a variety of human activities affect these birds, and in some situations significant mortality has been reported. Waxwings appear to be susceptible to impacts with windows and collisions with cars, often as a result of the planting of ornamental fruit trees close to these hazards. In the USA, for example, over 360 Cedar Waxwings were killed by cars after having been attracted to Russian olive (*Eleagnus angustifolia*) plantings in the central reservations of busy highways near Richmond, in Virginia. In addition, this species is occasionally killed when it crashes into towers during the night, but this is probably a minimal cause of mortality for this largely diurnal migrant (see Movements).

Exposure to pesticides is a potential risk for birds that feed on fruit and insects. For instance, the eggshells of Cedar Waxwings collected in Michigan, USA, in 1968/69 were significantly thinner than those of eggs collected prior to 1920, suggesting that they may have been affected by DDT. In one study, it was also reported that the incidence of hatching failure was higher in orchards than in other habitats, although this may have been due to disturbance rather than pesticide contamination. Direct mortality of adults exposed to pesticides has also been reported. In the Nagano prefecture of Japan, for example, 67 Bohemian Waxwings were reportedly killed in one episode of exposure to EPN.

Despite the various negative influences described in the above two paragraphs, it is possible that the overall impact of humans on waxwings has been a positive one. Certainly, Cedar Waxwings seem to have benefited from the break-up of extensive mature forests, which they eschew, and from the increase of edge habitats and young regenerating forests, which provide their preferred biotopes. Of course, some habitat alterations have also had negative consequences. Examples include extensive urbanization in some areas, the planting of monoculture forests that do not favour an understorey of fruiting shrubs, and possibly fire suppression. Nevertheless, the net effect has probably been favourable for Cedar Waxwings, at least, and possibly also for Bohemian Waxwings. The planting of ornamental trees that provide an abundance of winter fruit is also likely to have had at least some positive impacts on all three species of waxwing.



*Unlike its congeners, the **Japanese Waxwing** occupies a limited range, and its global population is apparently small. While there is no direct indication of any decline, it is difficult to assess trends in numbers because populations are mobile and patchily distributed, especially in winter. Because of these factors, and the possibility that perturbations of habitat could soon lead to a decline, this species is classified as Near-threatened. Surveys and field studies are required to identify more precisely its ecological requirements, in both summer and winter, and to monitor population size as accurately as possible.*

[*Bombycilla japonica*, Yamagata, Japan. Photo: Hirozo Maki]

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PLATE 31

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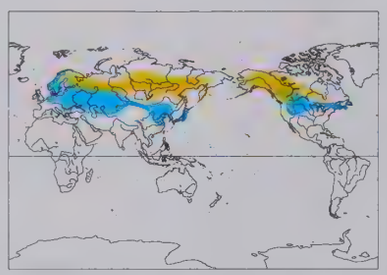
Genus *BOMBYCILLA* Vieillot, 1808

1. **Bohemian Waxwing**

Bombycilla garrulus

French: Jaseur boréal **German**: Seidenschwanz **Spanish**: Ampelis Europeo
Other common names: Waxwing, Greater/Common Waxwing

Taxonomy. *Lanius Garrulus* Linnaeus, 1758, Sweden.
Appears to be most closely related to *B. japonica*. Geographical variation involves only minor plumage differences; individuals from E part of range of *centralasiae* often as dark as nominate. Three subspecies recognized.
Subspecies and Distribution.
B. g. garrulus (Linnaeus, 1758) – breeds N Sweden, far N Norway, N Finland and N Russia (S of tree-line) E to approximately Ural Mts; non-breeding S to Poland, the Balkans, Ukraine, irregularly farther S.
B. g. centralasiae Poliakov, 1915 – breeds C & E Russia S of tree-line from approximately Ural Mts E to Sea of Okhotsk and Kamchatka, S to Altai Mts, L Baikal and lower Amur Valley; non-breeding S to Kazakhstan, N China and Japan, rarely to N Indian Subcontinent, S China and Taiwan.
B. g. pallidiceps Reichenow, 1908 – breeds NW & NC North America; non-breeding E to SE Canada (Newfoundland) and S to C & NE USA, irregularly farther S.
Descriptive notes. 19–23 cm; 34–85 g, average c. 55 g. Medium-sized passerine with prominent backward-pointing crest of moderate length, distinctive wing markings. Male nominate race has black mask from base of bill extending over eye and to rear of head under crest, white arc below eye, white streak below gape, black chin and throat; rest of plumage mostly brownish-grey, with



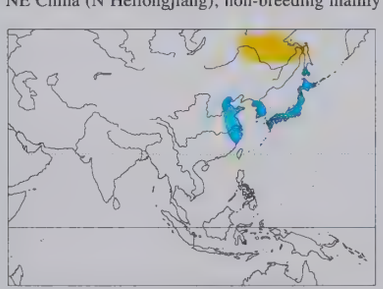
warmer tawny or cinnamon tones on head (especially crown and malar region), paler and greyer rump and underparts, dark chestnut-orange crissum; flight-feathers blackish, tips of primaries edged yellow on outer webs and more narrowly white on inner webs (forming yellow stripe and white fishhook markings on closed wing), broad white tips on primary coverts and secondaries, secondaries also with long wax-like red appendages; tail blackish with broad bright yellow terminal band, sometimes a few small red waxy tips; iris dark brown; bill black with blue-grey to pale horn base; legs dark grey to black. Female is very like male, but yellow tailband narrower, lower edge of black throat less well demarcated, generally fewer or broken white lines on outer webs of primary tips, often fewer or shorter red appendages on secondaries. Juvenile is duller and greyer than adult, has shorter crest, no black throat patch, less extensive black facial mask, no white tips on inner webs of primaries, paler (whitish) tips on outer webs, fewer wax-like tips on secondaries, narrower tailband, whitish underparts with diffuse brownish streaks. Race *centralasiae* differs from nominate in generally greyer and paler coloration, with little cinnamon coloration on malar area; *pallidiceps* is slightly lighter and less brightly coloured than nominate, but with more cinnamon on forehead and malar region than previous.
Voice. Most familiar call a ringing trill, "sirrr", similar to that of *B. cedrorum* but lower-pitched (5·3–6·4 kHz, usually below 6 kHz) and with notes more separated, average duration c. 400 milliseconds; also soft, sustained trilling vocalizations (often described as "song"), similar to typical call but mixed with wheezy notes, twittering and harsh scraping sounds; whistled calls of uncertain function occasionally given, but apparently much less often than by *B. cedrorum* or *B. japonica*.
Habitat. Breeds in boreal forest and muskeg. Prefers relatively open forest or edge, usually coniferous, e.g. spruce (*Picea*), pine (*Pinus*), etc., but occasionally in birch (*Betula*) forest or mixed

forest; favours well-drained areas near major rivers, normally including dense growth of fruiting plants. In non-breeding season found in wide variety of habitats with fruiting plants and at least scattered trees, including roadsides, gardens, farmland and edges of deciduous forest. Mostly lowlands and lower parts of uplands; also breeds in Rocky Mts in W USA.
Food and Feeding. Predominantly fruits and insects. Other foods noted include buds of various trees, flowers, tree sap, bark, shoots and leaves, moss and lichens; also spiders and snails, and varied table scraps from feeders. Strongly dependent on fruit during non-breeding seasons, probably also to large extent during breeding season; sometimes stated to be primarily insectivorous during breeding, but importance of insects in diet possibly exaggerated by conspicuousness of foraging method, and limited data on stomach contents indicate heavy use of fruit in summer. Important summer fruits include *Vaccinium*, *Sorbus aucuparia*, *Rubus*, and *Shepherdia canadensis*; at other seasons, fruits of *Sorbus*, *Juniperus*, *Cotoneaster*, *Crataegus*, *Rosa*, *Loranthus europaeus*, *Sophora japonica*, *Malus*, *Pyrus* and many others commonly eaten. Significant quantities of insects taken, including mosquitoes (Culicidae), midges (Chironomidae and others), beetles (Coleoptera), mayflies (Ephemeroptera), stoneflies (Plecoptera, e.g. of family Perlidae), caddis flies (of family Phryganeidae), dragonflies (Odonata). Insects often taken by aerial flycatching, probably also by gleaning.
Breeding. Relatively late season; some nests with eggs in late May, but laying more often begins mid-Jun and may continue to end Jul. Apparently monogamous. Territorial behaviour restricted to immediate vicinity of nest, and sometimes several pairs rather close together. Nest built by both sexes, an open cup of fine twigs and coarse grasses, lined with finer material including grasses, mosses, plant fibres and feathers or mammal fur, often fine material dangling some distance below cup; usually placed on horizontal branch of tree, often close to trunk, 1·3–15 m above ground. Clutch 3–7 eggs, mostly 5 or, less often, 6; incubation by female, fed on nest by male, period 14–15 days; chicks fed by both parents, fledge at 14–15 days, but up to 17 days if weather conditions poor.
Movements. Partial migrant, withdraws from large portion of breeding range in winter. Main non-breeding range in Old World extends W to E Britain and S to Balkans, Ukraine, Kazakhstan, N China and Japan; in North America movements largely to ESE, regularly wintering in SE Canada and to lesser extent in C & NE USA, well E of major breeding populations. Apparently does not show fidelity to non-breeding sites; one ringed in Poland in winter was recovered in following winter c. 5500 km to E, in E Siberia. Main departure from N parts of range usually in Sept, but some individuals linger, depending on abundance of berries; arrival in wintering areas Oct–Nov, numbers at S extremes of range continuing to increase until Feb; wanders widely during winter months. Return migration starts early, from Feb, passage intensifying in Mar in many regions; arrives in N sections of breeding range in Apr and early May, but some still far to the S at this time. Renowned for periodic irruptive movements, large flocks sometimes reaching areas well outside normal wintering grounds, in Old World e.g. much of W & C Europe and S China, and smaller ones as far S as Mediterranean region (including N Africa), Middle East, N Indian Subcontinent and Taiwan; in America sometimes S to S USA. Numbers involved often massive, e.g. c. 34,000 present in just one region of SW Germany alone during one invasion; during major irruption in North America in 1908, one dense flock 60–90 m wide took 2–3 minutes to pass over the observers' heads. Recent record of flock of five individuals in Bermuda, in W Atlantic Ocean. May show some evidence of approximate 10-year cycle in irruptions in Europe.
Status and Conservation. Not globally threatened. Common. Populations estimated at 25,500–102,000 pairs in Scandinavia and 100,000–1,000,000 pairs in Russia. No estimates for North America, but numbers no doubt substantial, on basis of winter counts that often involve flocks of more than 1000 individuals; numbers wintering in Maritime Provinces of E Canada seem to have increased in recent years. Extensive breeding range mostly to N of dense human populations; this, coupled with the species' utilization of disturbed habitats, suggests that populations not likely to suffer significant declines in the near future.
Bibliography. Ali & Ripley (1987a), Anderson (1909, 1915), Anon. (1998b), Armstrong (1983), Arvey (1951), Baicich & Harrison (1997), Bent (1950), Berthold (2001), Blok (2000), Blyumental (1961), Braeko & Grošelj (1990), Brazil (1991), Cadman (1987), Campbell *et al.* (1997), Cramp (1988), Cyr & Larivée (1995), Dementiev *et al.* (1968), Dobson & Gray (2002), Duncan (2002), Duncan & Church (1992), Erik (1961), Eriksson & Nummi (1982), Étchécopar & Hüe (1964, 1983), Fleming (1968), Godfrey (1986), Grahn (2004), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Heath *et al.* (2000), Heinroth & Steinbacher (1952), Hellmayr (1935), Howell (1973), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Jiang Zhihua & Zhang Yuling (1987), Kaufman (1996b), Keith *et al.* (1992), Kessel (1989), Knapton & Sexton (1978), Knystautas (1993), Koenig (2001), Kulakowski & Polakowski (2003), Lewis (1949), Li Kueiyan (1958), MacKinnon & Phillipps (2000), Meaden & Harrison (1965), Mountjoy & Robertson (1988b), Nankinow (1993), Palmgren (1960), Paz (1987), Peck & James (1987), Phillips (1947), Price *et al.* (1995), Pulliainen (1985a), Pulliainen *et al.* (1981), Ridgway (1904), Ripley (1982), Roberts (1992), Rogacheva (1992), Root (1988), Saari & Pulliainen (1997), Sapetina (1998), Shevarea (1961), Shimeld & Shimeld (1997), Shirihai (1996), Snow & Perrins (1998), Stepanyan (1990), Ulfstrand (1963), Vaurie (1958, 1959), Whitehead (1907), Witmer (2002), Yoshida *et al.* (2001), Zheng Guangmei & Zhang Cizu (2002), Zimin *et al.* (1961).

2. Japanese Waxwing
Bombycilla japonica

French: Jaseur du Japon **German**: Blutseidenschwanz **Spanish**: Ampelis Japonés
Other common names: East Asian Waxwing

Taxonomy. *Bombycivora japonica* Siebold, 1824, Kumamoto and Fukuoka prefectures, Kyushu, Japan.
Appears to be most closely related to *B. garrulus*. Monotypic.
Distribution. Breeds SE Russia (E Yakutia, Khabarovsk and Amur), also irregularly in adjacent NE China (N Heilongjiang); non-breeding mainly E China, Korea and Japan.

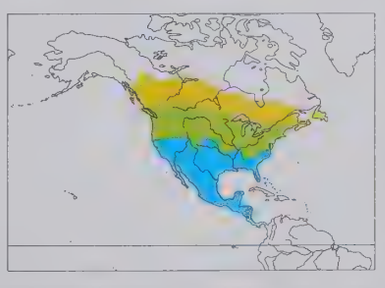


Descriptive notes. 15–18 cm; 54–64 g. Medium-sized passerine with prominent backward-pointing crest of moderate length, distinctive wing markings. Male has black mask from base of bill extending over eye and to rear of head under crest, white arc below eye, short white streak below gape, black chin and throat; rest of plumage mostly greyish-brown, with warmer tawny tones on head (especially crown and malar region), grey on rump; greater secondary wing-coverts edged bright chestnut-red on outer webs; flight-feathers bluish-grey to blackish, white tips on both webs of primaries, sometimes a spot of pink on outer web, usually small red spots at tip of outer webs of secondaries, rarely one or more small wax-like shaft tips (waxy tips usually lacking); tail dark grey to blackish, bright pinkish-red band at tip; paler below, lower underparts often yellowish, crissum reddish; iris deep red to dark brown; bill blackish; legs dark brown. Female is very like male, but somewhat paler, small red spots at tips of secondaries lacking or reduced, crissum duller, more ochre. Juvenile mainly grey, darker on crest, whitish on belly with flanks heavily streaked dark grey; first-winter plumage has white line only along outer webs of most of primaries. Voice. Commonest call a high-pitched trill, similar to that of congeners, but shorter (150–380 milliseconds) and slightly higher (5·5–6·4 kHz) than trill of *B. garrulus*; also, frequently gives high (5 kHz) whistled calls, ranging from short (c. 205 milliseconds) to long (c. 540 milliseconds), that may represent two call types.
Habitat. Breeds in forested areas; apparently favours coniferous trees, including larch (*Larix*), spruce (*Picea*) and fir (*Abies*); presence of fruiting plants likely also to be important component of breeding habitat. In winter occurs in deciduous and mixed forest, as well as in more open habitats with scattered trees, including parks and gardens, so long as fruiting trees present.
Food and Feeding. Few data, but diet apparently similar to that of congeners. Summer foods include *Vaccinium* berries and insects. Feeds on variety of fruits in other seasons, including mistletoe berries (*Viscum coloratum*) and Amur grapes (*Vitis amurensis*).
Breeding. Little information available. Probably relatively late breeder; laying from early Jun, female specimen from R Amur in late Jun was apparently in middle of laying; flocks of juveniles observed on R Maya at end Aug. Thought to nest as individual pairs. Few nests found; nest built of larch twigs and lichens, placed at 8–10 m in larch. Clutch 5 eggs, occasionally 4 or 6; incubation by female. In captivity: incubation 15-16 days; fledging 16 days.
Movements. Relatively short-distance migrant. Apparently vacates breeding range almost completely; some may winter in extreme SE Russia (S Primorskiy), but numbers dependent on fruit crop and this may influence winter distribution generally. Main non-breeding range E China (mainly Hebei and Shandong), Korea and Japan; sporadically farther S, to C & SE China (S to N Yunnan and Fujian), Ryukyu Is and Taiwan. Typically arrives in Japan in late Nov, exceptionally in early Oct, and departs early Apr, with stragglers until mid-May; arrival back on breeding grounds in May. In S Primorskiy seen principally on spring migration, and rare in autumn, suggesting that species may take different routes for migration S.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Generally uncommon, but locally common in suitable breeding habitat. Occurs in relatively limited range, and global population thought to be small. Use of human-altered habitats in non-breeding season, at least, suggests that this species may not be greatly affected by human activities, but further study warranted; may have declined as a result of logging and development of forest in its breeding range. Possibly adversely affected by pesticides or other control measures used by commercial fruit-growers. May cause some damage by feeding on buds of kiwifruit (*Actinidia*).
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3. Cedar Waxwing
Bombycilla cedrorum

French: Jaseur d'Amérique **German**: Zedernseidenschwanz **Spanish**: Ampelis Americano
Other common names: Cedar Bird

Taxonomy. *Bombycilla cedrorum* Vieillot, 1808, Pennsylvania, USA.
Birds from N of range named as race *aquilonia*, but description based on wintering individuals of uncertain origin, and slight colour differences seem unreliable. Two subspecies recognized.
Subspecies and Distribution.
B. c. cedrorum Viellot, 1808 – breeds extreme S Alaska and S Yukon E across C & S Canada to Newfoundland, S in E USA to N Georgia; non-breeding regularly S to Costa Rica.
B. c. larifuga Burleigh 1963 – breeds SW Canada and W USA S to N California; non-breeding S probably to at least W Mexico.



Descriptive notes. c. 15·5 cm; c. 32 g. Medium-sized passerine with distinctive crest of moderate length pointing rearwards from crown. Male nominate race has black mask extending from base of bill back over eye and to rear of head under the crest, outlined by thin white line from forehead to over eye, white arc below eye and short white streak below gape; chin and throat black; rest of head, and upperparts to back, tawny-brown, rump grey; wings grey-brown, dark grey flight-feathers, secondaries (and rarely other flight-feathers) with red wax-like shaft extensions at tip, white line on inner edge of tertials; tail dark grey with black subterminal band, contrasting bright yellow band at tip (tip sometimes orange); underparts paler, belly usually with strong yellow tone, undertail-coverts whitish; iris dark brown; bill blackish; legs dark brown. Female is very like male, but has throat brown, with black restricted to chin. Juvenile is duller and greyer than adult, has shorter crest, paler throat, diffusely streaked underparts; first-winter differs from adult in having few or no wax-like shaft extensions on secondaries. Race *larifuga* is paler and slightly greyer than nominate. Voice. Calls high-pitched, and most fall into two categories. "Bzeee Call", commonly given when perched, a trill consisting of 5–20 or more closely spaced elements, dominant frequency c. 6–8 kHz, duration 100–400 milliseconds, quite variable in length, repetition rate and volume, perhaps reflecting motivation; some other named calls seem to be variations of this, e.g. contact and courtship calls similar in structure but shorter and are rapid trills, while begging call also similar but given in long, often loud series; also warbling call, soft and variable in structure, function unclear, usually given by relatively inactive birds (perched or incubating), has been described as "song". Second major category is "Seee Call", a high (6–7 kHz) hissy whistle, may rise in pitch at beginning but mostly at constant frequency, often given in flight or just before flock takes off (switch from "Bzeee" to "Seee" usually indicates imminent departure); disturbance call similar, but with strong frequency drop at end.
Habitat. Variety of habitats with trees and shrubs, but generally favours edges or open woods, and avoids dense forest; presence of fruiting plants an important component. Specific habitats include

old fields, riparian areas, deciduous and coniferous woodlands, bogs, orchards and suburban gardens. Winter habitats often include urban areas with ornamental fruiting trees and shrubs, and open woodland with many junipers (*Juniperus*).

Food and Feeding. Relies heavily on fruit (84% of annual diet); insects (12% of annual diet) consumed primarily in spring, when fruit scarce. Also feeds on flower parts (4% of annual diet), mostly in May; often selects petals of e.g. apple (*Malus*) blossoms and ignores reproductive parts. Occasionally feeds on sap in spring, and reported as consuming salt-rich mud. Important fruits in diet include mulberry (*Morus*), serviceberry (*Amelanchier*), cherry (*Prunus*), dogwood (*Cornus*), blueberry (*Vaccinium*) and raspberry (*Rubus*); in winter includes those of mountain ash (*Sorbus*), crabapple (*Malus*), Russian olive (*Elaeagnus*) and juniper. Prefers sugary fruits or those with mix of sugars and lipids; avoids those primarily of lipids. Fruits normally obtained while bird perched or dangling, but sometimes plucked in short flight or during brief hover. Insects consumed are mainly aerial forms, captured during short sallies, or herbivorous species, gleaned from vegetation; include mayflies (Ephemeroptera), dragonflies (Odonata), ants (Hymenoptera), scale insects (Coccoidea), caterpillars (Lepidoptera) and beetles (Coleoptera). Often flycatches from prominent perch near water.

Breeding. Season later than that of most birds: laying usually begins early Jun, but some nests initiated early Aug; rarely, active nests late Sept and early Oct. Apparently monogamous (at least seasonally). Lack of territoriality allows close spacing of nests on occasion, e.g. 8 nests in 0·18 ha, but most nests not clustered; concentrations likely due to density of suitable sites, rather than social attraction. Nest built by both sexes, an open cup of small twigs, grasses and roots, sometimes pieces of string, strands from fishing nets or other artificial material incorporated, and with flowering heads of grasses or catkins dangling below the structure; placed 1–15 m (majority below 4 m) above ground in fork of horizontal branch, often of dense young tree or shrub, also regularly on high branch in more sparsely vegetated tree, frequently in juniper, apple, maple (*Acer*), oak (*Quercus*) or pine, occasionally in vine (e.g. *Vitis*) supported by tree. Clutch 2–6 eggs, usually 4 or 5, yearling females lay smaller clutches; incubation by female, male delivers food to her either at nest or nearby, incubation period 11–13 days, typically 12 days; chicks fed by both parents, male providing more, especially in first 3 days, while female broods for extended periods, nestlings fledge at 14–18 days, usually 15–16 days; fledglings fed by both adults for 6–10 days, only by male if female lays second clutch. Between 50% and 75% of nests produce fledglings, with 2·6–3·8 young per productive nest in various studies. Most birds probably breed in first summer after fledging. Annual mortality c. 55%.

Movements. Complex and not fully understood. Withdrawal and return to N parts of breeding range on predictable schedule, indicating regular migration, but movements apparently continue throughout winter in response to fruit crops. Non-breeding range extends S to Mexico and Costa Rica; irregular in occurrence in S Central America and West Indies, vagrant in N South America. Ringing recoveries indicate that individuals may winter in E or W USA in different winters. Adults move S from late Aug, c. 1 month before juveniles, arrival in S USA normally Oct or Nov and in Central America Dec, occasionally earlier; some leave wintering areas in extreme S in Feb, but generally a late migrant, some lingering in Costa Rica until mid-May, generally departing S USA late May or early Jun. Sometimes becomes more numerous in N sections of wintering range in Feb–Mar, but probably not true migrants. Low philopatry to precise breeding areas, but most probably return to same region; no evidence that individuals breed in different regions in subsequent years. Vagrants recorded in Europe (Iceland, Britain).

Status and Conservation. Not globally threatened. Abundant in much of breeding range. Numbers generally stable or increasing; Breeding Bird Survey shows 1·3% annual increase from 1966 to 2002. Has probably benefited in some areas from successional vegetation changes after abandonment of marginal farmland, and perhaps also from forest fragmentation. Planting of ornamental fruiting trees and shrubs may also have helped this species. Adverse human factors include use of pesticides; some evidence from eggshell-thickness data suggests that it may have been affected by DDT in past. Some mortality caused by collisions with vehicles (especially if ornamental plantings attract flocks to roadways) and with windows and other structures.

Bibliography. Anon. (1998b), Arendt (1992), Armstrong (1983), Arvey (1951), Avery, Decker *et al.* (1995), Avery, Goocher & Cone (1993), Baicich & Harrison (1997), Bartlett (1956), Beal (1892), Bent (1950), Berthold (2001), Binford (1989), Browning (1990), Brugger *et al.* (1994), Burleigh (1963), Campbell *et al.* (1997), Crouch (1936), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Godfrey (1986), Hellmayr (1935), Holthuijzen & Adkisson (1984), Howard (2002), Howell, J.C. (1973), Howell, S.N.G. & Webb (1995), Hudon & Brush (1989), Hutto (1980), Jackson, J.A. (1997), Karasov (1999), Kaufman (1996b), King (1996), Lea (1942), Leck & Cantor (1979), Levey & Duke (1992), Levey & Grajal (1991), López & Ornelas (1999), Martínez del Río *et al.* (1989), McPherson (1987, 1988), Meyerriecks (1957), Moermond & Denslow (1985), Mountjoy (1987), Mountjoy & John (1987), Mountjoy & Robertson (1988a, 1988b), Murphy *et al.* (1997), Nice (1941), Osborne (2000), Ouellet (1961), Paynter (1995), Peck & James (1987), Price *et al.* (1995), Putnam (1949), Raffaele *et al.* (1998), Read (1991), Ridgely & Gwynne (1989), Ridgway (1904), Root (1988), Rotenberry *et al.* (1995), Rothstein (1971, 1972, 1973, 1976a, 1976b, 1977), Saunders (1911), Slud (1964), Snow & Perrins (1998), Stiles (1980, 1985), Struempf *et al.* (1999), Studier *et al.* (1988), Wiedenfeld *et al.* (1992), Witham & Hunter (1992), Witmer (1996a, 1996b, 1998, 2001), Witmer *et al.* (1997), Yunick (1970).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family HYPOCOLIIDAE (HYPOCOLIUS)



- Medium-sized, long-tailed passerine with greyish plumage, male with black face mask.
- 23 cm.



- South-west Asia.
- Subtropical riverine forest, date palms, gardens and scrub.
- 1 genus, 1 species, 1 taxon.
- No species threatened; none extinct since 1600.

Systematics

Since being named in 1850 by C. L. Bonaparte, the Hypocolius (*Hypocolius ampelinus*), or Grey Hypocolius, has generally been considered to be most closely related to the waxwings (Bombycillidae). Indeed, it has sometimes been placed within that family, typically being awarded a monotypic subfamily, Hypocoliinae, with the waxwings themselves and the New World silky-flycatchers (Ptilogonatidae) usually treated as two further subfamilies. In contrast to these ideas, C. G. Sibley and J. E. Ahlquist appeared to believe that the Hypocolius was more closely related to the bulbuls (Pycnonotidae), and placed it next to them in a family of its own, but with the caveat that there was no firm evidence for a relationship with the bulbuls.

The Hypocolius does, indeed, bear a close resemblance to the waxwings, particularly in structure, plumage pattern, social patterns and behaviour. In these respects, it does seem to be closer to them than to the bulbuls.

As there are no DNA data which may shed some light on the possible relationships of this species, it is perhaps sensible to adopt a traditional view of its systematic position. Whether the Hypocolius genuinely merits separation in a family of its own is a matter open to question, but such treatment serves to highlight the uncertainty, and may help to draw attention to the species, thus encouraging further study of this interesting bird. Clearly, the Hypocolius is in need of a much more detailed taxonomic investigation.

Morphological Aspects

In structure, this enigmatic, sleek passerine most closely resembles a long-tailed bulbul of the genus *Pycnonotus*, but with certain features, notably the short, stubby bill and the short crest, that are suggestive of waxwings. In addition, it is often likened to the grey shrikes (*Lanius*) and the *Turdoides* babblers. With regard to the plumage, it exhibits patterns that are similar to those found in the waxwings, as it possesses a black facial mask and prominent markings on the tail tip and the flight-feathers.

The sexes differ, and there is no seasonal variation in plumage. The male is a soft bluish-grey above and pale buff or whitish below, with a conspicuous black mask over the eyes and extending on to the nape, isolating a grey-buff crown; this pattern creates a shrike-like appearance. In excitement, the ear-coverts and nape feathers are raised to form a short crest. The male also has extensive white tips on the black primaries and a well-defined black tip on the tail, features that are prominent in flight. The primaries appear all white when the bird is perched. The female is duller, pale grey-brown, with a creamy throat rather well demarcated from the darker cheeks and ear-coverts, but no black mask. As her tail has only an ill-defined terminal band, and there are only narrow white tips on the otherwise grey-brown primaries, the female exhibits little contrast in pattern when in flight. Juveniles are a pale sandy brown in colour, with washed-out blackish tips on the tail feathers.

Adults and juveniles have a mainly blackish bill and straw-coloured to pinkish legs and feet. The bill is short and blunt and the legs and feet short and fairly heavy, very like those of the waxwings, although the claws are a little longer than those of the latter. The toes are rather like those of an Old World warbler (Sylviidae). The sleek body, long tail and rather warbler-like toes assist with the species' mode of feeding among the branches of fruiting trees (see Food and Feeding).

Adults undergo a complete moult after breeding. Although only limited information is available, this appears to take place from early July to October. Juveniles undertake a partial moult, the timing of which is uncertain but probably coincides more or less with that of the adults. This juvenile moult involves the head, most or all of the body feathers, some or most of the upperwing-coverts, and a variable number of the tertials and their coverts; the central pair of tail feathers, too, is occasionally renewed in this moult.

Habitat

The Hypocolius is found throughout the year in the subtropical zone, occupying lowland drainage basins within its restricted south-west Asian and Middle Eastern breeding range. The areas inhabited by this species are characteristically better-vegetated corridors or belts within generally level or gently undulating terrain. River valleys traversing or fringed by desert or semi-desert, and supporting open broadleaf woodland or copses, are favoured for breeding. The landscape is typified by meandering earth-banked rivers, ox-bow lakes and seasonally flooded marshy depressions, with an associated woodland patchwork. The preferred woodland for nesting is often dominated by tamarisk (*Tamarix*), occasionally with the declining riparian poplar *Populus euphraticus*, but in most cases also with extensive stands of an all-important food source, fruiting



*The male **Hypocolius** is a sleek bluish-grey passerine with a dark mask flaring behind the eye, and a sharply contrasting dark tip to the tail. Its general shape and pattern recall a bulbul (Pycnonotidae) or a shrike (Laniidae), but its stubby bill, the texture and pattern of its plumage, and its social behaviour suggest that it is most closely related to the waxwings. It is unique in several respects, however, suggesting that it is best retained in a monotypic family, at least until its true taxonomic affinities are determined.*

[*Hypocolius ampelinus*, Ghantut, United Arab Emirates. Photo: Hanne & Jens Eriksen]

Salvadora persica, as an understorey, or at least in close proximity. In the southern part of the breeding range, tamarisk is still usually present, but acacia (*Acacia*) may be the dominant species in surrounding woodland and the tree in which nests may be located. The presence of ample fruiting *Salvadora persica* in the vicinity, even if across open plains or rivers, appears to be an ecological necessity for this species in summer.

During the winter months the Hypocolius is restricted to the subtropical and arid tropical zones, occurring in abundance to just south of the Tropic of Cancer in the Arabian Peninsula (see Movements). Its non-breeding habitat includes acacia woodland, groves of date palms, overgrown gardens, thorny scrubland and other woodlands. It has also, in recent years, been increasingly recorded at this time of the year in irrigated plantations, particularly those with *Salvadora persica*.

In the non-breeding season, this species typically assembles at communal roosts. The favoured habitat at winter roost-sites is generally neglected or abandoned date gardens, thorny woodland, most often of acacia, and also irrigated mixed plantations.

General Habits

This is a gregarious bird, both during and, especially, outside the breeding season, and it is often conspicuous. When breeding, however, it becomes shy and may quickly abandon its nesting attempt. In non-breeding areas, however, the Hypocolius can be confiding, or even tame, and thick cover can permit the observer to approach closely.

In what appears to be an anti-predator response, the Hypocolius will freeze and remain silent in the centre of a thick, often spiny tree or bush, especially an *Acacia* or *Zizyphus*. This behaviour has been noted during the presence of Common Kestrels (*Falco tinnunculus*), Eurasian Hobbies (*F. subbuteo*), Eurasian Sparrowhawks (*Accipiter nisus*) and human beings. When the Hypocoliuses do flush, they generally fly, sometimes in a low sweep, only a short distance into yet more cover, quickly and nimbly clambering into the interior of the thickest part. On some occasions, they will fly off strongly in a direct line for several hundred metres or circle around at some height for a few minutes.

Although alarm calls are given in response to the presence of predators, such as snakes, near the nest, more animated mobbing has not been reported. Agitated individuals may erect the nuchal feathers to form a small pointed crest, which, in the case of adult males, includes part of the black feathering of the nape.

The species is social at all times, and without demonstrating antagonistic behaviour, even when feeding or collecting food. Moreover, breeding pairs occur at high density in suitable nesting habitat (see Breeding), and family parties and small flocks remain social and highly vocal at such times. The birds are active throughout the day in summer, even though temperatures may reach 49°C, and they make regular trips to nearby rivers and pools in order to drink, when up to a dozen individuals may visit simultaneously. The Hypocolius regularly visits water during the non-breeding season, too, dropping to the ground briefly to drink from pools, tanks, barrels, *falaj*s (irrigation channels) and drainage channels. In the wintering areas, groups have also been observed at lawn sprinklers.

Communal roosts, sometimes containing over 500 individuals, are a typical feature of this species on its wintering grounds. The birds arrive punctually at the roost-site each evening, with a seasonal progression in relation to daylength clearly evident. The first sign of their arrival is often their distinctive calls, heard as they fly high overhead, although it can be difficult to pinpoint the exact position of an arriving flock.

Although individuals sometimes fly in singly, they generally arrive in flocks, in Bahrain of up to one hundred birds at a time. Swirling flocks may circle the roost for several minutes, but if undisturbed they will plunge directly into the roost from some height, quickly and deftly moving into the centre of a thorny bush or suckering date palm, where they remain silent but vigilant. Flocks often break up during descent over the roost, smaller parties then dispersing into different parts of the overall area. One or more individuals may perch openly during the earlier stages of arrival, or move into the open again shortly after reaching the roost. The birds often remain somewhat jittery and will sometimes take to the wing again, circling around while calling, before dropping in once more. Although the arrival at the roost is typically at high level, as with winter roosts of Redwings (*Turdus iliacus*), for example, individuals and flocks sometimes fly in at low level immediately prior to dusk. No further movement or calling is noted after nightfall.

Departure from the roost takes place at first light, generally in small groups of fewer than ten individuals. If the roosting birds are disturbed by humans, however, a mass and rather disordered exodus may be provoked.

This species exhibits strong fidelity to roost-sites from year to year, even when apparently similar sites are present in abundance in the surrounding habitat. In Bahrain, subsidiary pre-roost assembly points have been identified where, although some indi-



Unlike its presumed relatives the waxwings (Bombycillidae), the ***Hypocolius*** *is characterized by distinct sexual dimorphism. In all seasons, females are pallid, poorly marked versions of males, with pale throat patches. The ill-defined dark mask and the prominent pale base to the lower mandible imply that this is a young bird. As in females, the dark patch at the tip of the tail is much more restricted and diffuse in juveniles, and they lack the black and white effect so conspicuous on the underwings of adult males.*

[*Hypocolius ampelinus*, Ghantut, United Arab Emirates. Photo: Hanne & Jens Eriksen]

viduals may stay overnight to roost, others simply convene before moving off again to join the main roost.

The normal flight of the Hypocolius is strong and direct, with a characteristic whirring wing action. It may glide or bank aerobatically, and it often descends rapidly from high up in a swooping closed-winged dive, almost a plummet, not unlike that of a thrush (Turdidae). It bears more than a passing resemblance to the Southern Grey Shrike (*Lanius meridionalis*) and bulbuls of the genus *Pycnonotus*, both in flight and when perched openly, and this presumably accounts for the species' alternative, but now obsolete, name of "Shrike-bulbul".

Voice

The Hypocolius is vocal at most times. Moreover, with the exception of a loud continuous "kirrr", which is a feature of courtship display, the calls are apparently the same throughout the year. No true territorial song has been described.

The flight call is a distinctive mellow, liquid and slightly querulous or whirring "tre-tur-tur", with the notes running together and the last two lower-pitched. When perched, the Hypocolius utters a descending whistled "whee-oo", this being remarkably reminiscent of the typical call of the Eurasian Wigeon (*Anas penelope*) heard from a distance. This vocalization, although construed as being the contact call of individuals concealed in thick cover, is occasionally given also in flight. When feeding, the Hypocolius often remains silent for long periods. A collective murmuring, with mewing calls almost like those of a buzzard (*Buteo*), is heard at the roost. These calls are very like the one just described, but rather muted, and are similar to those emanating from a Common Starling (*Sturnus vulgaris*) roost, for example.

Food and Feeding

Like its probable relatives the waxwings (see Systematics), the Hypocolius is a specialist frugivore, although it does also take a variety of arthropod prey. Aerial feeding for flying insects has been observed in winter, and individuals have been seen to drop to the ground to pick up live beetles (Coleoptera). Otherwise, this species reportedly gleans invertebrates from plant foliage and branches while perched, such feeding often taking place unobtrusively in the centre of a bush.

In summer, although it very often feeds close to the nest-site, the Hypocolius has been observed to make lengthy flights across open plains to feeding grounds away from the immediate nesting area. The quantity of invertebrate prey taken in the breeding season, particularly to provision the nestlings, may be substantial, although supporting data are lacking.

This species feeds extensively on the berries of the plant *Salvadora persica* throughout the year. The Hypocolius, while perched, leans and cranes forwards to pick fruits with rather deliberate movements, these akin to those of, for example, the larger *Sylvia* warblers. The stones and skin of fruits may be rejected after chewing, although small stones and pips are reportedly swallowed and later excreted. There is a similarity in the pattern of feeding activity to other frugivorous species, such as the Bohemian Waxwing (*Bombycilla garrulus*), to which the Hypocolius is thought to be taxonomically closely related (see Systematics). A period of active feeding is often followed by a sojourn in nearby cover, where the bird preens and wipes its bill, and presumably also digests what it has already consumed and passes waste matter, before returning to resume feeding, often in the original spot, some tens of minutes later. Single individuals acting as sentinels on a nearby tree are often an indication of the presence of feeding groups.

During the non-breeding season, when foraging habitats includes date-palm groves with citrus trees, irrigated plantations, wooded farmland and gardens, the diet is again dominated by fruits. In Bahrain, where most study of this species has been undertaken, the food is stated to consist primarily of fallen unharvested dates gathered from the ground. This is not invariably the experience elsewhere in the region, where, although large areas of date groves exist, they are often wholly shunned. When available, the fruit of planted mulberry (*Morus alba*) is taken. The berries of the woody desert shrub *Lycium shawii* are consumed avidly in western Saudi Arabia, and similar observations have been made in Qatar. The Hypocolius may on occasion feed on the apple-like fruits of the "sidr" tree (*Zizyphus spina-cristi*) in Arabia and on those of *Zizyphus nummularia* in southern Makran, in Pakistan. In the latter country, it has also been observed to eat young leaf shoots of *Prosopis spicigera*. Winter visitors in the Rann of Kutch, in western India, were found to have consumed the berries of both *Salvadora persica* and *Lantana aculeata*, the latter being an invasive introduced species there. In Iraq, in the breeding quarters, this species is again reported as favouring ripe dates.

Departure from the winter feeding grounds to the roost begins up to one or two hours before dark, the birds climbing steeply away at intervals over a period of 45 minutes. Perhaps surprisingly, little or no feeding takes place at the roost-site, even when an apparently suitable food supply is present.

Breeding

Nesting takes place from April to July, and two broods are reared annually. Pairing takes place on the breeding grounds, and the first pairs form up to twelve days after the arrival of the first females. Nest duties are shared by both sexes.

The Hypocolius breeds in small, loose colonies of about five to 40 pairs, each of which defends its own small nest-site territory. In favourable habitats fairly high densities can be reached; in south-western Iran, for example, 20–30 nesting pairs were recorded within an area of 200–300 ha, and about 40 pairs were present in 200 ha in the Murgab Valley, in south Turkmenistan. The distance between nests varies from a few metres to 50 m or 100 m.

At the start of the season, males attract females by indulging in short bursts of activity during which the black-and-white wing pattern is prominently displayed. Courtship feeding takes place during the nest-building and egg-laying stages, when pair-members will also perform circling display-flights. In the latter, the partners rise to some 20 m or more above the ground and, keeping a metre or two apart, fly in circles about 20 m wide while giving repeated loud "kirrr" calls. Other features of courtship, observed mostly during the nest-building phase, include bill-rubbing and, in particular, a complex dance in which the male, carrying food, circles the female in a series of hops while shivering his slightly drooping wings. This courtship dance can last for up to five minutes, at the end of which the female begs and is offered the food by the male.

Nest-building begins in April. Both sexes take part in the work, which is completed in four days. The grass-lined cup-shaped nest is constructed in a tree fork, usually in dense cover, between 1 m and 4 m above the ground. The preferred nesting sites are in tamarisk and acacia or in another thorny tree.

Eggs are laid between May and July. In a two-year study in Iraq, the first eggs were recorded on 11th May and the latest laying date was 12th July. It is probable that egg-laying sometimes starts earlier, at least in some parts of the range, as a nearly completed nest has been found in southern Iran on 22nd April. The eggs are oval, smooth and glossy, with a white to very pale grey ground colour, usually patterned with dark grey or grey-brown blotches around the broad end. The clutch is of three to five eggs. The most frequent clutch size appears to be four eggs, and clutch size generally diminishes through the course of the season. Eggs are laid during the early morning, at one-day intervals, but occasionally two days elapse between the laying of consecutive eggs.

Incubation, which begins with the first egg and lasts for 14 days, is undertaken by both sexes, although the female's share of the task is the greater. The eggs hatch asynchronously, over a 73-hour period in one study. Both sexes also care for the chicks, the female again taking on a greater proportion of this duty. For the first five to seven days, the nestlings are brooded more or less continuously. During the daytime when they are not being brooded, one parent will nearly always remain perched on the rim of the nest in order to shade the chicks from the sun. The young leave the nest at 13–14 days, and the family-members stay together for at least a short period thereafter, the duration of this union being unknown.

Movements

The Hypocolius occupies its breeding areas from April or May until August or September. The species then undertakes relatively short-distance movements, primarily in a southerly or south-easterly direction. Although it is clearly not nomadic, it is erratic in terms of the numbers appearing annually in traditional winter and passage stopover resorts. Except in the Karun district, in western Iran, where the Hypocolius is still found in winter, the entire population leaves the breeding grounds in autumn. Migration is nocturnal, and most movement is probably over distances of no more than 1000 km, and perhaps substantially less. There are no ringing recoveries.

The core of the wintering range lies in southern Iran and Pakistan, in the regions of Makran, Baluchistan and Sindh, and in western and central Saudi Arabia and coastal districts of the western Gulf States, primarily Bahrain. A number can also sometimes be found at this season in the United Arab Emirates. This species occurs as a vagrant in Oman, Yemen, Palestine and Israel, and in north-east Africa, where it has been recorded in Egypt, Sudan and Eritrea. Its status in western India is generally regarded as that of a vagrant, although it may be a regular non-breeding visitor in the state of Gujarat.

Autumn passage through southern Iraq lasts from late September until mid-November. In the western Gulf, the Hypocolius makes its first autumn appearance typically by mid-October, after which a rapid build-up takes place, with peak numbers generally present from November to January. The number of individuals overwintering in this region, however, varies annually, and may be exceeded by the total of passage migrants passing through, at least in the southern Gulf. The species is a localized winter visitor to Bahrain, appearing in variable numbers from year to year. It arrives there from early October, with the highest counts being made in November or December. Smaller numbers remain into the early part of the year, and the species is usually scarce by mid-January, although in some years small flocks have remained into March or early April. After the Hypocoliuses have left Bah-



One link between Hypocoliidae and Bombycillidae is the fact that both families are highly mobile and gregarious in the non-breeding season. At this time of year, the ***Hypocolius*** *forages in groups, sometimes moving considerable distances between food patches. These groups coalesce to form communal roosts at night. Flocks arrive from different directions, sometimes circling the roost site for several minutes before swooping down to sheltered perches.*

[*Hypocolius ampelinus*, Ghantut, United Arab Emirates. Photo: Hanne & Jens Eriksen]



The flight of the ***Hypocolius*** *is strong and direct, as befits its itinerant lifestyle. Although it has a rather limited breeding range, centred on Iran and Iraq, virtually the entire population vacates this region in winter. Most birds migrate to the south and east, usually travelling no more than a thousand miles, but some individuals regularly turn up in north-west India or the United Arab Emirates, or further afield.*

[*Hypocolius ampelinus*, Manama, Bahrain. Photo: Hanne & Jens Eriksen]

rain in mid-winter, no return spring passage has been detected. This lends support to the hypothesis that a circular migration is performed (see below).

In Saudi Arabia, the Hypocolius is locally numerous in western areas, from the Hejaz mountains northwards, arriving here in force from the second half of December onwards and remaining to beyond mid-March. Many are present in the winter months also in central parts of this country and around the oases and farmland of the Eastern Province. Spring migration takes place along the northern Gulf coast of Saudi Arabia and Kuwait, as well as through mainly coastal districts of the United Arab Emirates, although in the latter areas very few pass through in some years. In the UAE, it is recorded inland only in March or early April, corresponding with the period when a strong passage is recorded in coastal resorts, which usually reaches a peak in the second half of March. Spring stopovers can continue for several weeks, with numbers of individuals progressively decreasing into the early or middle part of April. The species occurs as an occasional late-autumn migrant on southern Gulf islands, being far rarer on the return passage in spring, although occasional overwintering has been noted on larger UAE islands where cultivations, including those of mature *Salvadora persica* (see Food and Feeding), are present.

The timing of respective departures and appearances in northern and southern Gulf States supports the hypothesis that this species performs a circular or "loop" migration through the Arabian Peninsula. In fact, it is a double-loop, with return passage northwards following both western and eastern routes. There is also some suggestion that its migration patterns are changing in response to the recent availability of man-made habitats, particularly plantations and shelterbelts. Certainly, the appearance of flocks in winter or on passage is a recent and increasing phenomenon in many areas.

Although it is uncertain whether any movements are made in response to cold weather, this remains a possibility. Nevertheless, the irregularity with which flocks appear in some sites is perhaps more likely to be due to the effects of the strong north-west wind, the *shamal*, which prevails in the Arabian Gulf, and which could easily displace individuals during periods of active migration. A further factor is the availability of food supplies, which must also be of importance and contribute to the almost irruptive appearance of flocks in certain years. In this context, the irregularity and typically wide variability in annual rainfall throughout most of the species' winter range may be of some significance.

The breeding areas are reoccupied in spring from April onwards. Arrival is slightly later in the north of the range, such areas then being occupied until August or early September, at least. There is an apparent tendency for males to arrive back on the nesting grounds a few days before the females. This was noted in a study in Iraq, for instance, and it seems likely to apply throughout the species' breeding range.

Relationship with Man

The Hypocolius appears to have no practical significance to man, and no noticeable impact on human interests. There is perhaps a single exception to this generalization, and this relates to ecotourism. This is one of the species most sought-after by birdwatchers in the Middle East. Many birders will travel to the Gulf countries especially to see it in its relatively accessible winter roosts and feeding areas. It is not known to be hunted or in any way persecuted, and, although a fruit-eater, it is not regarded as a pest.

In both its breeding areas and its winter quarters, the Hypocolius frequently associates with humans. It feeds in gardens, palm groves and fruit plantations, often close to occupied buildings, and it regularly makes use of plantations, shelterbelts and date-palm groves for the purposes of roosting. As it requires a readily available supply of water, it will visit water tanks and even lawn sprinklers to drink in the arid lands bordering the Arabian/Persian Gulf. In fact, it is possible that the species has benefited from human activities, especially where otherwise inhospitable wintering areas have been planted with fruit-bearing trees and are irrigated.

Status and Conservation

Although the Hypocolius is regarded by BirdLife International as not being globally threatened, this may be somewhat conjectural. The world population of this species, which has a small range restricted to the Middle East and south-west Asia, is not known, nor are there any data on its population trends or any precise mapping of its breeding distribution. As the greater part of the population breeds in Iraq and Iran, where it may be difficult to conduct field surveys, any attempts at population estimates are probably best done in its winter haunts. Several large roosts have been discovered in these (see General Habits), but the present information is insufficient to enable even an approximate guess of its total numbers to be made.

There is some evidence of destruction of the species' riverine-forest breeding habitat in Iran, and the extensive drainage schemes undertaken in Iraq in the past two decades are unlikely to have been beneficial. In the non-breeding season, flocks tend to exhibit fidelity to their roosting sites, at least in the southern Arabian Gulf, and it is important that these sites are not destroyed and that they are kept free of disturbance. In one instance, a large part of one winter roost in Bahrain was bulldozed in April 2000, although the birds remained tenacious in continuing to utilize the small area left. In north-west India, there is concern that scrub-jungle habitat used by wintering individuals is being destroyed as a result of overgrazing.

On the other hand, as pointed out above (see Relationship with Man), this species has probably also been helped in recent years by the creation of favourable new habitats.



Genus *HYPOCOLIUS* Bonaparte, 1850

1. **Hypocolius**

Hypocolius ampelinus

French: Hypocolius gris **German**: Seidenwürger **Spanish**: Hipocolio
Other common names: Grey Hypocolius

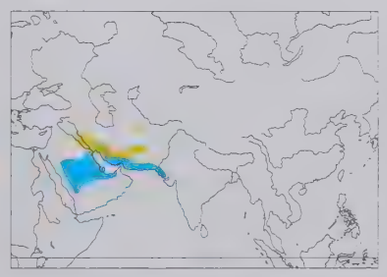
Taxonomy. *Hypocolius ampelinus* Bonaparte, 1850, "California"; error = coast of Abyssinia. Relationships uncertain. Often considered to constitute a subfamily, Hypocoliinae, within the family Bombycillidae; suggested by some authors to be closer to Pycnonotidae. Further research required. Monotypic.

Distribution. Breeds E Iraq, SW & S Iran, S Turkmenistan and W Afghanistan; non-breeding mainly S Iran, S Pakistan, W & C Saudi Arabia and coastal districts of W Gulf States.

Descriptive notes. 23 cm; 48–57 g. Distinctive passerine with shape like that of a sleek, long-tailed *Pycnonotus* bulbul. Male has greyish-buff crown, black face mask extending to nape; otherwise pale blue-grey above, primaries black with extensive white tips, tail broadly black-tipped; paler, pale buff or whitish, below; iris dark brown; bill blackish, paler at base; legs yellowish-flesh to straw-coloured. Female lacks black mask, is duller, pale grey-brown above, with narrow whitish tips to primaries and ill-defined dark terminal tailband, pale creamy throat contrasting with dark ear-coverts and lighter grey-brown underparts. Juvenile is pale sandy brown, with washed-out blackish tips to tail feathers, flesh-coloured base to lower mandible. Voice. Mellow "tre-tur-tur", last 2 notes lower in pitch; descending "whee-oo" when perched, occasionally also in flight; loud continuous "kirrr" during courtship display.

Habitat. Mostly confined to wooded areas of lowland drainage basins and riverine valleys of subtropical zones when breeding; particularly important are date-palm groves and *Populus euphraticus* woodland, with tamarisk (*Tamarix*), acacia (*Acacia*) or other thorn trees for nesting. Non-breeding habitat similar but more wide-ranging, including desert scrub, irrigated plantations and fruit groves. Presence of fruiting trees (especially *Salvadora persica* and date palms) essential; supply of drinking water also important.

Food and Feeding. Specialist frugivore; some invertebrates also taken. *Salvadora persica* berries form major part of diet throughout year; dates also locally important, these generally gathered as fallen unharvested fruits on ground. Other fruits regularly taken (records mostly from non-breeding range) include those of mulberry (*Morus alba*), the desert shrub *Lycium shawii* and *Zizyphus spina-cristi*; in Pakistan observed to eat fruits of *Zizyphus nummularia* and young leaf shoots of *Prosopis spicigera*, and in W India berries of the introduced invasive plant *Lantana aculeata*. Feeds socially in small groups, usually unobtrusively within dense foliage. Forages usually from perch, by leaning and reaching forwards; also on ground. Stones and skin of fruits may be rejected after chewing, but small stones and pips reportedly swallowed and later excreted. Invertebrates are gleaned from foliage and branches; seen also to to drop to ground to pick up beetles (Coleoptera); aerial feeding for flying insects observed in winter.



Breeding. Egg-laying from mid-May at latest, continues to mid-Jul; two broods appear to be typical. Semi-colonial, up to c. 40 pairs in loose association; each pair defends only immediate area around nest-site. Cup-shaped nest built by both sexes, of grass and vegetable down on base of small twigs, lined with finer grass, down, sometimes also hair and wool, placed 1–4 m off ground typically in tamarisk, acacia or other thorny tree. Clutch 3–5 eggs; both sexes incubate and both feed and brood chicks; incubation period 14 days, nestling period 13–14 days.

Movements. Short-distance migrant. Small numbers remain in W Iran throughout year; majority migrate S & E, main wintering areas in S Iran, Pakistan, W India, W & C Saudi Arabia, and Arabian Gulf States (notably Bahrain). Departure from breeding areas mainly Aug–Sept; arrives back mostly Apr, later in N of range. Vagrants recorded in several countries S to Egypt, Sudan, Yemen and C India.

Status and Conservation. Not globally threatened. Reasonably common; population size, precise range and trends poorly known, thus difficult to assess true status. Restricted to SW Asia/Middle East. Evidence of destruction of riverine forests in which it breeds, and also of winter roost-sites; conversely, the planting of fruiting trees and irrigation will have been of benefit to this species. Not persecuted; not considered a pest, despite fruit-eating habits.

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Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family DULIDAE (PALMCHAT)



- Medium-sized, olive-brown passerine with streaked underparts, deep and strongly curved bill, longish, rounded wings, and sturdy legs and feet.
- 18-20 cm.



- Hispaniola.
- Open and semi-open habitats, especially savanna with royal palm, also open forest.
- 1 genus, 1 species, 1 taxon.
- No species threatened; none extinct since 1600.

Systematics

The Palmchat (*Dulus dominicus*) is the sole representative of its family, Dulidae. It is restricted to the West Indian island of Hispaniola, an island shared between the countries of Haiti and the Dominican Republic. Most modern authors consider the Palmchat to be allied to the waxwings (Bombycillidae) and the silky-flycatchers (Ptilogonatidae), although there is ongoing debate as to whether it is sufficiently distinct taxonomically to merit independent family status.

References to this species date back at least to the sixteenth century, and it was formally classified in 1766, by Linnaeus, who included the Palmchat with the euphonias (*Euphonia*) in his genus *Tanagra*. Subsequently, the Palmchat was placed with the waxwings and silky-flycatchers in a family Ampelidae, and this treatment remained the consensus with most authors until 1904, when R. Ridgway split this group into three separate families, the Bombycillidae, the Ptilogonatidae and the Dulidae. Many twentieth-century taxonomists continued to follow this classification, although some treated the three taxa as subfamilies within Bombycillidae, and a few authors even included the Hypocolius (*Hypocolius ampelinus*) of south-west Asia in a fourth bombycillid subfamily.

In the last decades of the twentieth century, many previously held beliefs were challenged by the findings of molecular-genetic studies. C. G. Sibley and J. E. Ahlquist, in their comprehensive reappraisal of avian phylogeny and systematics based on DNA–DNA hybridization, suggested that the oscine passerines formed two major lineages, which they treated as "parvorders", each of which they further subdivided into three superfamiles. The perceived fundamental relationships of the Palmchat, however, remained unaffected. These authors included the Palmchat, the waxwings and the silky-flycatchers in the family Bombycillidae, within their parvorder Passerida.

Evidence regarding the taxonomic affinities of *Dulus* is sometimes conflicting. In a 1951 study of plumage coloration, nesting and feeding habits, skeletal characters, certain muscles and the digestive tract, M. D. Arvey concluded that the waxwings, the silky-flycatchers and the Palmchat were closely related and that they should, indeed, be included in the same family. Further support for this arrangement comes from the fact that the humeral fossa is single in these three groups, as it is also, incidentally, in the woodswallows (Artamidae), which Sibley and Ahlquist placed in their parvorder Corvida; this situation provides a rare exception to the general rule that members of the Passerida possess two such fossae and those of the Corvida one. Jaw-muscle characters have been interpreted as indicating that the waxwings, the silky-flycatchers, *Dulus* and *Hypocolius* are all related to one another, and also to the cuckoo-shrikes (Campephagidae) and the bulbuls (Pycnonotidae). Analysis of egg-white proteins by electrophoresis, however, seems to have shown no close relationship between *Dulus* and either *Bombycilla* (Bombycillidae) or *Phainopepla* (Ptilogonatidae).

The plumage of the Palmchat is somewhat hard and harsh, unlike the silky, blended plumage of the waxwings and silky-flycatchers, and, whereas the latter groups build typical open cup-nests, the Palmchat builds a massive, domed communal nest. In addition, the absence of natal plumage in *Dulus*, again an unusual condition among passerine birds, is a feature shared with *Bombycilla*.

Sibley and Ahlquist's analyses, based on DNA–DNA hybridization, support the long-held view that the waxwings and the silky-flycatchers are the closest living relatives of the Palmchat, and indicate that the three taxa share a common ancestor, the Palmchat having diverged from the ancestral lineage before the split between the waxwings and the silky-flycatchers occurred. DNA from *Hypocolius* was not available for analysis. These authors suggested that the Palmchat should not be accorded a family of its own but, rather, that it should be considered as a tribe, the Dulini, within the family Bombycillidae. This revision has yet to gain wide acceptance. They also suggested that, despite the single humeral fossa, *Dulus*, *Bombycilla* and *Phainopepla* are, indeed, members of the parvorder Passerida, and that they seem to be closest to the dippers (Cinclidae), the thrushes (Turdidae), the Old World flycatchers (Muscicapidae) the starlings and mynas (Sturnidae) and the mockingbirds and thrashers (Mimidae). Evidence to support a relationship with the latter groups is, however, somewhat equivocal.

At the species level, the Palmchat is generally considered monotypic. The population on the island of Gonâve, off the west coast of Haiti, was once believed to represent a geographical subspecies, described by A. Wetmore, in 1929, as *oviedo*. The validity of this race has, however, been questioned, and the taxon has never been generally accepted. It has not been included in any recent check-lists.

Fossil specimens of *Dulus* dating from the Pleistocene have been found in cave deposits on Hispaniola, indicating that the species has been on the island for at least 25,000–50,000 years.

Morphological Aspects

A moderately odd bird in the field, looking most like a coarse-plumaged tanager (Thraupidae) or Old World oriole (Oriolidae), the Palmchat's large bill, small head and long, mobile neck give it a somewhat ungainly appearance. It is easily recognizable because of its noisy and gregarious nature, and because there are no other Hispaniolan species with which it is apt to be confused.

The Palmchat has a deep and strongly curved bill, which is decidedly shorter than the head, and a relatively long, rounded wing. The tail is of medium length, and the legs and feet are large and sturdy, with strongly curved claws. The long wings are an adaptation to this species' largely arboreal habits, and its sturdy feet and strong bill enable it to break off and manipulate the large sticks that it uses in the construction of its massive communal nest (see Breeding). The Palmchat's ability to grasp heavy sticks securely in its beak is made possible by the presence of a shallow trough in the lower mandible.

The plumage of both the male and the female is olive-brown above, including the head, with the back, scapulars and upperwing-coverts decidedly more brownish. The lower rump and uppertail-coverts are greenish-olive, and the tail is brown. The primaries and secondaries, but not the tertials, are edged with yellowish-green, which can be almost invisible in dull conditions, but quite conspicuous in bright sunlight. The underparts are pale buffy, generally broadly and sharply streaked with sooty brown, although the degree of streaking is quite variable. The throat colour also varies somewhat, from buffy white to dusky. The legs and feet are dark grey, the bill is bone-coloured and the eye is red. In the field, there are no evident differences between the two sexes that would enable them to be distinguished. Juvenile plumage is similar to that of the adult, although somewhat darker, with the throat and foreneck almost entirely dark brown, and the rump is buffish, rather than greenish.

Less obvious structural features include rounded nostrils and obvious but minute rictal bristles. The wing contains ten primary feathers, of which the longest are the sixth, seventh and eighth. The tail is shorter than the distance from the bend of the wing to the tip of the secondaries, and the tail feathers are rather narrow, with a broadly rounded tip and stiff shafts.

The Palmchat is of medium size for a passerine, measuring 18–20 cm in length. Measurements taken from museum skins indicate little sexual size dimorphism, although the wing length of males may be slightly longer, on average, than that of females. Few data are available regarding the weight of adult Palmchats. W. J. Arendt and co-workers reported a mean weight of 51 g for two adult males and 47·5 g for five unsexed individuals, and H. J. Temple found that the mean weight at fledging of 15 nestlings was 41 g.

Habitat

Palmchats are found in a wide range of open and semi-open habitats, as well as in broadleaf and pine (*Pinus*) forests, but they are most numerous in low-elevation savannas with abundant royal palms (*Roystonea hispaniolana*). This plant is the Palmchat's preferred nesting site, and its fruits make an important contribution to the bird's diet. Palmchats have been reported as occurring regularly from sea-level to altitudes of up to 1800 m, in areas with both high and low levels of rainfall, although they are absent from the highest mountains and from very dense closed-canopy woodland. The highest elevation at which the species has been reported is 1825 m, below Morne la Selle, in Haiti, and it is described as common at up to 1800 m in La Visite National Park, also in Haiti. In the Dominican Republic, on the other hand, the Palmchat is rarely seen above 1500 m.

Since much of Hispaniola would have been forested in pre-Columbian times, this species may well have benefited from anthropogenic habitat change. Farmland, parks and gardens all provide suitable habitat. Indeed, Palmchats seem quite undeterred by human disturbance and thrive even in the centre of Santo Domingo, the capital of the Dominican Republic and harbouring a human population of more than two million.

General Habits

Although the Palmchat is a conspicuous bird, moving around in flocks in the treetops, and it is readily encountered in open country throughout the island of Hispaniola, it is not a well-known species. It is not particularly wary, but it tends to remain in the higher strata of vegetation, with the result that it is more difficult to observe than other common Hispaniolan species.



The sole representative of the family Dulidae, the ***Palmchat*** *is a heavy-billed, ungainly bird, not so much odd-looking as out-of-place, resembling an Old World oriole or Australasian figbird (Oriolidae), and yet endemic to the Caribbean island of Hispaniola. It is traditionally grouped with waxwings (Bombycillidae) and silky-flycatchers (Ptilogonatidae), and these are still considered to be its closest relatives. There have been moves to join all three in a single family, but the Palmchat is so odd in the pattern and coarseness of its plumage, as well as major features of its behaviour and voice, that its separation in a monotypic family seems unavoidable.*

[*Dulus dominicus*, Santo Domingo, Dominican Republic. Photo: Don Roberson]

Palmchats are highly social at all times of the year. They can frequently be seen perched along a branch, each in physical contact with its neighbour, or flying after one another while carrying the bulky twigs with which they construct their massive communal nests. These nests are used by the group-members not only for breeding, but also for roosting outside the breeding season. They are added to continually over the years, and can exceptionally reach dimensions of several metres in diameter. Other birds, including the Greater Antillean Grackle (*Quiscalus niger*) and even species as large as the Yellow-crowned Night-heron (*Nycticorax violacea*), have been reported as building their own nests atop occupied Palmchat nests.

The Palmchat has a swift and often notably direct flight, the bird taking a beeline from the nest to other trees containing berries or nest twigs. The flight action combines rapid wingbeats with occasional glides, rather like that of its close relative the Bohemian Waxwing (*Bombycilla garrulus*). It is agile in tree and bush foliage, where it sometimes makes use of its long legs and hooked claws to cling to the underside of branches. Its feeding actions and gait are reminiscent of those of a large tit (*Parus*) or crossbill (*Loxia*). It is almost never seen on the ground.

Unfortunately, the Palmchat has been the subject of only a few scientific studies. As a consequence, relatively little is known about its social organization, or, indeed, its natural history in general.

Voice

The Palmchat is quite a noisy and vocal bird, particularly when close to its nest. It has a repertoire of strange calls, some harsh and others more tuneful. Cheeps, gurgles, caws and whistles may all be heard. These are sometimes emitted singly, while at other times they are uttered as a sustained "chattering" that sounds rather like that given by a Common Starling (*Sturnus vulgaris*), although less complex than the latter's. The species has no true song.

Little is known about the context of particular calls, with the exception of the alarm call. Palmchats have a well-developed sentinel system. When a raptor appears, a loud "cheer, cheer, cheer", a musical whistle that drops in pitch, is instantly given, sometimes by the whole group in chorus. Thereafter, the flock immediately becomes quiet and still, and any individuals in flight or otherwise exposed dive for cover. This alarm call is apparently specific to raptors, and is not given when human intruders approach or climb towards the nest.

Food and Feeding

Palmchats have fairly broad dietary habits, and reports demonstrate that they feed on a wide range of fruits, insects, and even flowers and leaves. A dissection of the stomachs of 58 adult Palmchats revealed that, in 57 cases, the contents consisted entirely of vegetable matter. Similarly, faecal samples taken from 99 nestlings consisted largely of fruit seeds, with a small percentage of arthropod material. This species appears, therefore, to be primarily frugivorous, supplementing its diet with a little animal matter. G. Mauersberger speculated that apparent folivory, or leaf-eating, by the Palmchat might be a result of its consuming leaves containing the mining larvae of insects.

An interesting feature of this species' ecology is that its nest-sites serve also as food resources. Palmchats nest almost exclusively in royal palms, which typically bear a heavy crop of berries. They can frequently be seen feeding on these berries, and seeds of royal palm were often found in the faecal samples taken from nestlings. Other plant species exploited for food by this species include guano palm (*Coccothrinax argentes*), caya colorado (*Bumelia salcifolia*), penda (*Citharexylum fruticosum*) and almacigo (*Bursera simaruba*), as well as *Bunchosia glandulosa*, *Mammea americana*, *Inga fagifolia*, *Piper aduncum*, *Cecropia peltata*, *Rauwolfia nitida*, *Wallenia aurifolia*, *Sabal umbraculifera* and species of *Annona* and *Cordia*.

Palmchats often or, indeed, almost always forage in groups. They show a strong preference for the upper levels of trees and palms, rarely being seen in bushes, and they never forage on the ground. The insect items in the diet are gleaned from trees and plants or caught on the wing.

Breeding

The most striking aspect of this species' behaviour is its unusual nesting habits. Groups of Palmchats build bulky stick nests, often over 1 m in diameter and height, and occasional nests with dimensions of up to 2 m have been recorded. Within this communal structure, each pair has its own separate nest-chamber, which is crudely lined with dried grass and strips of palm leaves. Generally, each compartment has its own separate entrance tunnel, measuring 5–40 cm or more in length, although some nests have a central chamber with the individual egg-chambers leading off this. Each pair apparently lives independently of the others. Oc-



*The **Palmchat** conducts most of its foraging activity at considerable heights above the ground, rarely descending to lower bushes, and much less the ground. It is essentially a vegetarian generalist: both adults and young consume a wide range of plant materials, especially fruit, supplementing this with very minor quantities of invertebrate prey. The range of fruit types noted in the diet is broad, deriving from several types of palm, and both native and exotic trees.*

[*Dulus dominicus*, Dominican Republic. Photo: Doug Wechsler/ VIREO]





By contrast with its important role as a major seed-dispersal agent on Hispaniola, the ***Palmchat*** *has a rather detrimental impact on an earlier stage of the plant reproductive cycle. Not only does it eat leaves, but it seems to be partial to devouring flowers, as these photographs attest. Indeed, initial observations of foraging groups suggest that folivory and florivory are rather common traits of this conspicuous species.*

[*Dulus dominicus*, Santo Domingo, Dominican Republic. Photos: Don Roberson]

casionally, two or more females may lay eggs in the same chamber, but whether this is due to parasitism or is an example of co-operation is unknown. Exceptionally large nests can be occupied by more than 50 pairs, although a more typical group size is of 4–10 pairs, and some nests are occupied by just a single pair.

The nest is used communally for roosting outside the breeding season, and it may remain occupied for several years. Nest-building and nest maintenance take place throughout the year.

Only a handful of bird species worldwide regularly construct multi-chambered communal nests; they include the Sociable Weaver (*Philetairus socius*), the Monk Parakeet (*Myiopsitta monachus*) and the Red-billed Buffalo Weaver (*Bubalornis niger*). It is worth remembering that the waxwings and the silky-flycatchers, supposedly the Palmchat's closest relatives (see Systematics), build open cup-like nests.

In the lowlands, the usual nest-site is in the frond bases of a royal palm, at a height of 6–25 m. The preference for royal palms is very strong; of 722 nests surveyed in 1985, as many as 699, or 97%, were situated in this species of palm. Conifers are utilized at higher altitudes, but nests built in these trees tend to be smaller, often housing only one pair. Palmchats have also been recorded as nesting on telegraph poles, although this apparently occurs less frequently than it did in the past. A more recent and fully documented record concerns a Palmchat nest built in an entirely unexpected site. In 2001, a nest of this species was discovered on a rock, surrounded by the waters of the Caribbean Sea, close to the shoreline at Cabo Rojo, in the south-west of the Dominican Republic. Only one pair of Palmchats appeared to be using the nest. This is the first terrestrial nest recorded for this species, and is clearly quite exceptional.

Breeding takes place from February through to August, or even later. The precise timing varies from year to year, and may also vary with geographical location. In the Dominican Republic, for example, the onset of breeding in the dry south-west was found to be in February, while in the north-east, an area with much greater rainfall, breeding in 2001 did not start until late April. In the Caribbean region in general, the onset of breeding for most passerine species is quite variable, and tends to coincide with the start of the rainy season.

During the courtship stage, the female Palmchat opens her bill and shakes her wings, whereupon the male provisions her with food, before mounting her. Observations made by S. Guerrero indicate that, rather surprisingly, pairs of Palmchats occasionally copulate in mid-air.

The Palmchat lays 2–7 eggs. The average size of 45 clutches was 3·7 eggs. Palmchat eggs are extremely variable in terms of both background colour and patterning. Background colours range from pale green through off-white and cream to mid-beige, and markings include blotches, speckles or scrawls in brown, purple-brown or grey. The markings may be light or heavy, and they may be concentrated at one end, usually the broad but sometimes the narrow, or evenly distributed over the whole surface. The eggs within a single clutch, however, are typically of a standard appearance. The fact that inter-clutch variability is so much greater than variability within a clutch suggests that intraspecific brood parasitism may occur, and that egg colour and pattern may be used as a "signature" to enable a female to recognize her own eggs. Of 44 clutches examined in 2001, eleven contained one, two or, exceptionally, three eggs that did not match the rest of the set. Furthermore, there were at least two instances of eggs appearing out of sequence, after the clutch had been completed, and this is likely to be an underestimate of the true rate, as nests were checked only every four days in this study. Because so little is known about the Palmchat's breeding behaviour, however, it is impossible to say whether this apparent brood parasitism may, in fact, be due to some form of co-operative breeding. The only thing that seems certain is that Palmchats have an unusual and fascinating social life, of which we know far too little.

Incubation lasts for about 15 days, and the nestlings fledge at approximately 32 days. Both the male and the female feed the chicks. Palmchats reach reproductive maturity at one year of age, and juveniles start to help with nest-building and with maintenance of the nest at the age of three months.

Botfly (Gasterophilidae) parasitism is a common problem for the Palmchat, and is significantly correlated with reduced nest success. This may be a cost of the Palmchat's highly social lifestyle. Predation may also be of some significance. Known nest predators of this species include snakes, Palm (*Corvus palmarum*) and White-necked Crows (*Corvus leucognaphalus*), the Sharp-shinned Hawk (*Accipiter striatus*) and the American Kestrel (*Falco sparverius*).

The Palmchat is one of six reported host species on Hispaniola for the Shiny Cowbird (*Molothrus bonariensis*), an invasive South American brood parasite which arrived on the island in 1972. A generalist, the Shiny Cowbird sometimes parasitizes its hosts at extremely high levels, over 90% in some instances, and it has been implicated in the decline of several Caribbean endemics. In the case of the Palmchat, parasitism rates in areas of the south-western Dominican Republic where cowbirds were known to occur were reported as 5·3% of 243 nests in 1974–77 and 25·8% of 62 nests in 1982; in the north-east, however, none of the 58 clutches located in 2001 was parasitized.



One of the most interesting aspects of ***Palmchat*** *biology is its habit of building massive domed nests almost exclusively in the high crowns of the royal palm* (Roystonea hispaniolana), *an association which gives rise to the bird's English name. These nests often exceed a metre in diameter and are usually attended by 4–10 pairs, although in exceptional cases nests have been found to house more than 50 pairs. It appears that each pair has its own independent nesting and roosting chamber, and it is not clear whether, or to what extent, breeding in the Palmchat is a co-operative endeavour.*

[*Dulus dominicus*, Santo Domingo, Dominican Republic. Photo: Doug Wechsler/ VIREO]

This species may not be an ideal host, as the nestling cowbirds require a diet high in animal protein, whereas Palmchats feed their chicks mainly on fruit (see Food and Feeding). It certainly seems that the Palmchat does not recognize the Shiny Cowbird as a threat. Female cowbirds are not harassed by this species, and have even been observed perched next to Palmchats within a few metres of the nest.

Movements

The Palmchat is resident throughout the year on Hispaniola, and does not undertake long-distance migration. Little is known about the local movements of this species. Mauersberger speculated that it may make some kind of seasonal migration between different altitudes or different habitat types. He based this theory on the fact that he observed fewer Palmchats during the post-breeding period than he had done before the breeding season started; this is contrary to the expectation that bird populations should be at their highest at the end of the breeding season.

Although this species is resident on the offshore islands of Gonâve and Saona, it appears to be a poor disperser. It is absent from small islands, such as Île-à-Vache, lying less than 10 km from the coastline of Hispaniola. There is, however, an anomalous report of a possible Palmchat observed in 1975 in Jamaica, although this remains uncorroborated.

Relationship with Man

Because of its conspicuous nests and its striking social habits, the Palmchat is well known to the general public. Indeed, it bears the title of the "National Bird" of the Dominican Republic. Despite this familiarity, however, the species does not appear to feature in Hispaniolan folklore. In the past, it was killed and eaten by man, as were virtually all bird species on Hispaniola. Today, in the Dominican Republic, at least, this practice is on the decline.

It is not really known if the Palmchat, being primarily a frugivore (see Food and Feeding), causes any real damage to commercial farming interests. If it is responsible for any losses, it makes up for these in its role as a seed-disperser.

Status and Conservation

Dulidae is one of only two families, the other being the todies (Todidae), having a world range confined to the West Indies. The Palmchat has a relatively small global range. It is restricted to the Caribbean island of Hispaniola, which covers a surface area of approximately 76,000 km². Within this range, however, it is an extremely abundant and widespread species, occurring also on the offshore islands of Gonâve and Saona. Mauersberger commented that the Palmchat was so common in the habitats around his residence that, of every ten songbirds seen outside shrubbery, at least eight or nine were likely to be of this species, often to the disappointment and frustration of birdwatchers visiting the island from abroad.

In a point-count survey carried out in the north-east of the Dominican Republic in 2001, the Palmchat was found to be by far the commonest species locally, with a population density roughly ten times greater than that of its numerically closest rival. This survey was made in royal palm savanna, prime Palmchat habitat. Nevertheless, as appropriate habitat for the species is widespread on the island, the Palmchat is certainly a strong candidate for the title of Hispaniola's commonest bird.

As the Palmchat adapts well to man-made habitats, it is less likely to be at risk from habitat loss than are many other species of fauna. There is, however, some evidence of fluctuations in Palmchat numbers over time. In suitable habitat in the Dominican Republic, for example, many fewer nests were found in 1996 than were located in the same areas in the years from 1974 to 1976.

Little is known about the current status of the Palmchat in Haiti, where human social and environmental problems are greater than they are in the neighbouring Dominican Republic. Although habitat loss in Haiti has been extensive, and hunting, especially for food, widespread, there are signs that the situation may be improving. Again, it is to be hoped that the Palmchat's adaptability will help to ensure that it continues to thrive in that country.

Fears have been expressed that nest parasitism by the Shiny Cowbird could have a negative impact on the species. This, however, seems improbable. Parasitism rates appear to be relatively low and, as discussed earlier (see Breeding), the Palmchat is unlikely to make a suitable host owing to the very low protein content of the nestling diet.





PLATE 33

inches 2
cm 5

Genus *DULUS* Vieillot, 1816

Palmchat

Dulus dominicus

French: Esclave palmiste **German**: Palmenschwätzer **Spanish**: Sigua Palmera

Taxonomy. *Tanagra dominica* Linnaeus, 1766, Santo Domingo, Hispaniola.
Taxonomic position debated. Generally considered to be allied to families Bombycillidae and Ptilogonatidae, and sometimes included as a subfamily within former. Birds from I de la Gonâve (off W Haiti) described as race *oviedo*, but appear inseparable from those elsewhere in species' range. Monotypic.
Distribution. Hispaniola, including I de la Gonâve and Saona I.



Descriptive notes. 18–20 cm; 41–52g. Medium-sized, dull-plumaged passerine with short deep bill strongly curved on culmen. Plumage is olive-brown above, rump greenish, tail brown; primaries and secondaries with brighter yellowish-green edges; pale buffy below, boldly but variably streaked with brown, entire throat sometimes dusky; iris red; bill dull horn-coloured to dull yellowish; legs dark grey to brown-grey. Sexes alike, male possibly on average longer-winged than female. Juvenile differs in having throat and foreneck almost entirely dark brown with only faintly paler edges, and rump buffish. VOICE. Variety of short, harsh notes, sometimes likened to those of Common Starling (*Sturnus vulgaris*); distinctive alarm call a musical whistle dropping in pitch, often given in chorus by group-members; no true song.

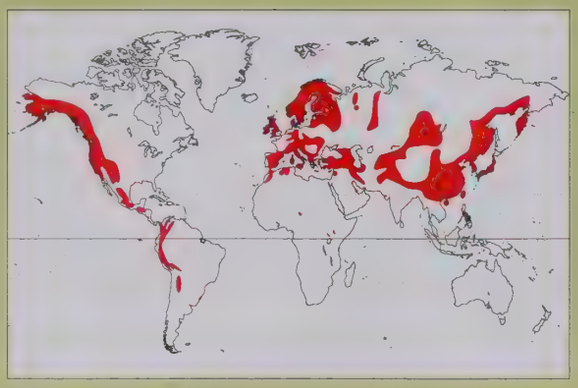
Habitat. Primarily royal palm (*Roystonea hispaniolana*) savannas, also other open areas with scattered trees, including urban parks and gardens; absent from dense forest. From near sea-level to 1825 m; usually commonest at low elevations.
Food and Feeding. Diet primarily wild fruits, also flowers and, apparently, leaves; some arthropods also taken. Fruits eaten include those of, especially, *Roystonea hispaniolana*; also guano palm (*Coccothrinax argentes*), caya colorado (*Bumelia salcifolia*), penda (*Citharexylum fruticosum*) and almacigo (*Bursera simaruba*), and *Bunchosia glandulosa*, *Cordia nitida* and *C. alliodora*, *Mammea americana*, *Annona reticulata* and *A. muricata*, *Inga fagifolia*, *Piper aduncum*, *Cecropia peltata*, *Rauwolfia nitida*, *Wallenia aurifolia*, *Sabal umbraculifera*. Typically found in small flocks or family parties; active, noisy. Arboreal forager, with distinct preference for upper levels of trees; occasionally forages in bushes. Arthropods taken by gleaning from substrate; also hawks insects in flight.
Breeding. Season Feb–Aug, with some regional variation, apparent peak in Mar–Jun. Communal breeder, single nest occupied by 1–50 pairs, typically 4–10 pairs. Nest a massive communal "apartment block", up to 1 m × 1 m, occasionally bigger (to c. 2 m), constructed of twigs, each breeding chamber usually with separate entrance tunnel 5–40 cm long, each lined with dry grass and palm-leaf strips; placed at height of 6–25 m, almost always in royal palm, sometimes in other palm (e.g. *Cecropia schreberiana*, *Sabal umbraculifera*) or tree (e.g. conifer in higher areas), rarely on telegraph pole; exceptional record of nest on rock just off coast; nest used also for roosting outside breeding season, often occupied for several years. Clutch 2–7 eggs, mean c. 4; incubation period c. 15 days; chicks fed by both sexes, nestling period c. 32 days. Nests parasitized by Shiny Cowbird (*Molothrus bonariensis*). Nest predadors include snakes, Palm Crow (*Corvus palmarum*), White-necked Crow (*Corvus leucognaphalus*), Sharp-shinned Hawk (*Accipiter striatus*) and American Kestrel (*Falco sparverius*); reduced success significantly correlated with botfly (Gasterophilidae) parasitism.
Movements. Resident. Unconfirmed record of vagrant in Jamaica.
Status and Conservation. Not globally threatened. Very common to abundant, and widespread. One of the commonest bird species on Hispaniola; numerous everywhere apart from highest mountains. Has adapted extremely well to man-made habitats, such as farmland, parks, town squares and city gardens. Some evidence of fluctuation in numbers; many fewer nests found in appropriate habitat in Dominican Republic in 1996 than found in same areas in 1974–76.
Bibliography. Anon. (1998b), Arvey (1951), Bock (1994), Bond (1985), Dod (1987), Fernández & Keith (2003), Greenway (1985), Guerrero (1990, 1997), Hellmayr (1935), Keith *et al.* (2003), Kirwan *et al.* (1996), Mauersberger (1992), Mir (1989), Raffaele *et al.* (1998, 2003), Sibley & Ahlquist (1990), Stotz *et al.* (1996), Wetherbee (1994), Wetmore & Swales (1931).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family CINCLIDAE (DIPPERS)



- Medium-sized, plump passerines with short cocked tail, relatively short, broad rounded wings, slender bill with slight hook, long strong legs, and soft, dense plumage.
- 14–23 cm.



- Nearctic, Neotropical, Palearctic and Oriental Regions.
- Fast-flowing streams and rivers, mostly in uplands, occasionally slower or still waters.
- 1 genus, 5 species, 24 taxa.
- 1 species threatened; none extinct since 1600.

Systematics

The family Cinclidae comprises five species in a single genus, *Cinclus*, with a combined geographical range covering North, Middle and South America, north-west Africa, Europe and Asia. The dippers are extraordinary in being the only passerines adapted to exploit aquatic habitats fully, by swimming and diving. They are similar in shape to large wrens (Troglodytidae), a fact which led taxonomists in the past to place Cinclidae close to Troglodytidae. Nevertheless, the dippers strongly resemble the thrushes (Turdidae) in general morphology and in the spotted juveniles of some species. Electrophoresis of egg-white proteins appears to confirm this affinity, and more recent DNA-sequencing studies suggest that the dippers should be placed close to both the Turdidae and the starlings (Sturnidae) in the proposed superfamily Turdoidea.

Among the dipper species, global distribution combined with genetic evidence derived from mitochondrial cytochrome *b* and ND2 genes suggest, with only minor uncertainty, that the genus *Cinclus* arose in Eurasia around four million years ago, but soon spread into the New World. Phylogenetic interpretation indicates close affinities between the two Old World species, the Brown Dipper (*Cinclus pallasii*) and the White-throated Dipper (*Cinclus cinclus*), and between the two South American ones, the White-capped Dipper (*Cinclus leucocephalus*) and the Rufous-throated Dipper (*Cinclus schulzi*), these two pairs being separated by the American Dipper (*Cinclus mexicanus*). The New World species and the Old World species are considered, in turn, to represent two sister-clades.

Geographical progression from the Old World into the New World was accompanied by the development of morphological variations. These are most obvious in the plumage differences among the species (see Morphological Aspects).

Of the five members of the family, one, the Rufous-throated Dipper, is considered monotypic. The other four have been divided into subspecies, but these are often based on slight plumage differences, on the characters of type specimens and on geographical distribution. Moreover, for the White-throated Dipper, initial genetic evidence from investigation of the mitochondrial cytochrome *b* gene suggests that the current intraspecific taxonomy could well be misleading and in need of reappraisal. Up to 20 races of this species have been described, these differing mainly in the colour of the head, nape, breast and belly, in the presence and width or otherwise of a chestnut band between the dark belly and the white breast, in the width of dark feather fringes on the underparts, and in size. Several of the named subspecies are distinct, notably the eastern *leucogaster*, the belly of which is white. In Central Asia, however, polymorphism occurs, and all-dark individuals can be found living alongside white-chested ones. Otherwise, Palearctic races have a rufous-brown or blackish-brown breast and belly. Some geographical populations are uniform, but others are highly variable. In Europe, the nominate race in the north and west has a blackish-brown belly and no chestnut band, whereas the British population has a strong chestnut area below the white breast, the chestnut extending onto the flanks and mid-belly. The British dippers have, therefore, been separated as the subspecies *gularis*, juveniles of which are also darker than juveniles of the nominate race. Other described subspecies are less distinct and may grade into each other, even a relatively small area. In general, dark-breasted forms of the White-throated Dipper, such as the nominate race, inhabit cooler, wetter climates, while rufous-brown forms are found in warmer, drier areas, such as those in southern Europe and north Africa.

Ironically, the north African race of the White-throated Dipper, despite its scientific name of *minor*, is one of the largest subspecies. Measurements of live dippers caught in the Atlas Mountains, in Morocco, revealed that these had exceptionally long wings and were heavy, the mean weight of nine males being 76 g and of three females 68 g; these figures have been confirmed by more recent samples. This subspecies was originally described on the basis of a small specimen.

The Brown Dipper, found in the eastern and southern parts of Asia, is divided into three geographical races, which vary in the degree of richness of the brown plumage. A few additional subspecies have been described, but these appear to be indistinguishable from pre-existing races.

In the New World, the American Dipper is distributed from western North America southwards through to Panama. One of its subspecies has an extensive range extending down the whole length of the Rocky Mountains; four others are usually recognized, all of them in Middle America, which differ only slightly in the shade of the plumage, and they may perhaps represent only clinal variation. In the Andes, the three currently recognized subspecies of the White-capped Dipper differ principally in depth of coloration and in the amount of white in the plumage, *leuconotus* from west Venezuela south to Ecuador being the most distinct of the three.

Morphological Aspects

All dippers are dumpy thrush-like birds with a short cocked tail, males being larger than females. They are medium-sized passerines, most individuals falling in the approximate size range of 16–20 cm, and they weigh about 50–80 g. They are highly adapted for an aquatic lifestyle, and their size, strength and general hydro-dynamic shape are ideally suited for swimming and diving in fast-flowing water (see Habitat, and Food and Feeding). They also have soft, long plumage and a thick layer of down, and they possess more body contour feathers than do passerines of comparable size. Dippers have a large oil-gland at the base of the tail, the oil being used during preening in order to maintain waterproofing. The dense and well-oiled plumage enables dippers to survive in near-freezing water and in the low temperatures found at high latitudes and high altitudes. In higher temperatures, dippers achieve thermoregulation by standing in shallow water so as to increase heat loss through the legs and feet, or they use shade as a means of protection from direct heat.

All five members of the family have short, broad wings with a powerful musculature, allowing the use of the wings for propulsion in water, often in torrential conditions. In order to ensure that they lose this power for only the briefest period during the annual moult, White-throated Dippers are unusual among passerines in shedding all of the inner primary feathers almost simultaneously, in keeping with the moult strategy of other aquatic birds. The energy expenditure does not increase at this time, but behavioural changes mean that the actions of flying and diving become infrequent. The moult sequences of other dipper species are not well known. Juvenile White-throated Dippers undergo their first moult 4–6 weeks after fledging. During this moult, they replace the body feathers and the lesser, median and inner greater wing-coverts, and then bear a closer resemblance to the adults.

The legs of dippers are long, strong, and equipped with sharp curved claws that grip rocks and mosses on the riverbed or riverbank. The nostrils are narrow, and have a broad membrane or nasal flap to enable closure during submergence. The bill is slender and slightly hooked. The eyelids are covered with white feathers, so that a flash of white is evident when the bird blinks. Bobbing, or dipping (see General Habits), is always accompanied by blinking, and the latter action is probably a signal in courtship (see Breeding), in threat displays and in alert-signalling to warn of potential predators (see General Habits). White-throated and American Dippers can blink 40–50 times per minute. The nictitating membrane has been described variously as milk-white or bluish-white and as cloudy or semi-transparent. This membrane can be moved across the eye independently or as a dipper blinks. It is thought to have a protective function when the bird is underwater, and it may serve to remove water droplets or dirt from the eye. The eye itself has enhanced powers of accommodation for vision in both air and water as a result of the well-developed sphincter muscles of the iris, which can change the curvature of the lens. The eye colour of adult White-throated Dippers is a rich chestnut, but young birds have eyes that are more olive-brown.

So far as plumage is concerned, two members of the family are uniform in coloration, the American Dipper being pebble-grey and the Brown Dipper chocolate-brown. The Rufous-throated Dipper is uniformly grey-brown, apart from the chestnut-coloured throat. The remaining two species have varying amounts of white in the plumage. In the case of the White-throated Dipper, this is confined to the throat and breast in most populations, but one of the Asian subspecies, *leucogaster*, has the entire underparts white. The White-capped Dipper of the northern and central Andes has, as its name suggests, a white crown, and two of its three subspecies, the nominate race and *rivularis*, have a white throat and upper breast. The third subspecies, *leuconotus*, possesses a white patch on the back, and the underparts are wholly white except for the lower flanks and vent. The two Neotropical cinclids, the Rufous-throated and White-capped Dippers, both have a white wingbar, this becoming evident particularly when the wings are flicked. At present there is no firm explanation for these intraspecific differences in colour pattern, although natural selection for cryptic coloration, coupled with features used by three of the species in interspecific or intraspecific signalling, seems most likely. Given the employment of some plumage features, such as the breast feathers, in courtship (see Breeding), elements of sexual selection are possible.

Little sexual dimorphism is apparent. Males have been reported as being darker than females, but dippers become darker with age, in addition to which individuals vary greatly through the year because of feather wear. Size varies within populations, but males are always larger than females.



The dipper family is a well-defined grouping of five, sexually monochromatic riverine species, all notably homogenous in shape, behaviour and ecology, differing only in size and pattern. The ***Brown Dipper*** *is typically robust and streamlined, as befits its semi-aquatic lifestyle. With a fairly stout bill, short wings and stumpy tail, it gives a somewhat rotund impression, often exaggerated by the fact that its tail is habitually cocked. This is one of the two Eurasian species, the other three all belonging to the New World.*

[*Cinclus pallasii pallasii*, Guangdong, China. Photo: John Holmes]

Juveniles of the American and Rufous-throated Dippers differ from the adults only in being paler, especially below, with the underparts mottled, and in having a paler bill. In contrast, juvenile White-throated Dippers are grey-brown above, much paler than the adults, and have buffy underparts with darker speckling. They acquire the adult plumage after about six weeks, sometimes later, but are still distinguishable until the second spring by having pale edges on the greater upperwing-coverts. The juvenile Brown Dipper is grey-brown with white spots above, and the wing feathers and wing-coverts are tipped white; the feathers of the underparts are whitish with brown tips, giving the bird a mottled appearance.

Habitat

The Cinclidae frequent upland fast-flowing streams and rivers, even to the most torrential reaches in mountain ranges, from the Rocky Mountains and the Andes in the New World to the Himalayas of Asia. Most mountain ranges in Eurasia are occupied either by the White-throated Dipper or by the Brown Dipper, or occasionally, as in the Tien Shan Mountains and the Himalayas, by both species. Although the White-throated Dipper occurs in north-west Africa, where it breeds in the Atlas Range in Morocco and in other mountains eastwards to Tunisia, no member of the family is present on apparently suitable mountain rivers elsewhere in that continent. Similarly, rivers in the mountains of eastern North America are unoccupied by cinclids. Dispersal across extensive unsuitable habitat, such as the Great Plains of North America or the Sahara Desert of Africa, has clearly never been achieved.

Although most dippers live in hill and mountain ranges up to elevations of at least 5000 m, altitude itself is non-limiting, and fast-flowing rivers, even those near sea-level, are commonly occupied. The basic requirements are well-oxygenated, clear and largely unpolluted water where stony beds have abundant invertebrate prey, especially, during the breeding season, caddis-fly larvae (Trichoptera), stonefly nymphs (Plecoptera), mayfly nymphs (Ephemeroptera) and calcium-rich molluscs, crustaceans or small fishes (see Food and Feeding). An abundance of salmonid eggs, as found, for example, in rivers around the Pacific rim, can also promote large dipper densities. The birds require rocks from which to feed or dive, and riffles, stony shoals and a stony or rocky substrate on which to find prey. Sites suitable for nesting and roosting are important, but they are often abundant in this habitat type. Cliffs, moss-covered rocks and waterfalls, and walls or bridges with ledges or crevices all provide ideal nest-sites and roost-sites.

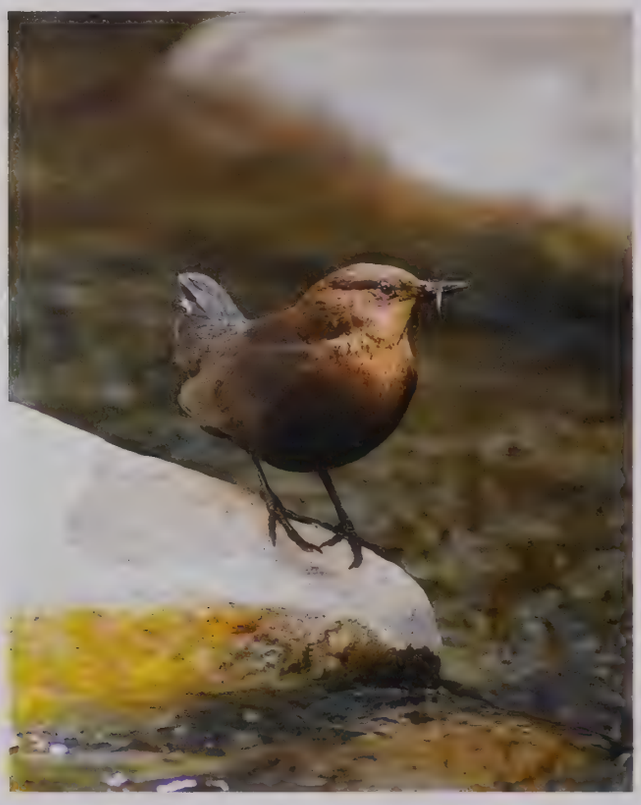
Artificial structures such as weirs, mill streams, walls and bridges can sometimes provide fast-flowing water and nest-sites at what would otherwise be the edge of the dippers' range. In addition, White-throated Dippers in Britain sometimes forage around the rocky edges of clear, nutrient-poor (oligotrophic) lakes and on seashores, particularly outside the breeding season.

Watercourses in forests are favoured locations. This is partly because trees provide a supplement of terrestrial insects, notably caterpillars, to the river margins, but also because falling leaf litter is ultimately important for the production of stream insects. Dippers will nest on rivers in villages, towns and other urban sites, and tolerate more open watercourses, provided that the basic requirements are met.

The five species of dipper are, for the most part, geographically isolated from one another, with the exception of a zone of overlap between the Brown Dipper and the White-throated Dipper in Central Asia. In the Himalayas and mountains to the north of there, Brown Dippers are common from about 900 m to at least 3500 m, occasionally ascending above 5000 m where streams remain unfrozen, while White-throated Dippers occur from about 3500 m to 4800 m, occasionally coming lower outside the breeding season. The two species therefore overlap at higher elevations in the Tien Shan Mountains and on the northern Himalayan slopes. There is some suggestion, but little quantitative evidence, that in these cases White-throated Dippers occupy smaller streams than those utilized by Brown Dippers. The extraordinarily rich variety of river-dwelling birds in the Himalayas means that ecological segregation from other abundant river passerines, such as forktails (*Enicurus*), the Plumbeous Water-redstart (*Rhyacornis fuliginosa*) and the White-capped Water-redstart (*Chaimarrornis leucocephalus*), is far more of an issue, and this is achieved by subtle partitioning in habitat use, prey size and diet.

General Habits

In addition to diving, the most conspicuous habit of three of the five species of dipper is the exaggerated bobbing of the body





*The most widespread member of the family, the **White-throated Dipper**, ranges across the Palearctic from western Europe to China. This distribution is broad but patchy, prompting diversification into some twelve races. The most uniform birds are found in the Himalayas, where some are almost entirely brown, a dark morph originally described as a separate race,* sordidus. *By contrast, across the Tibetan Plateau, not far to the north in central Asia, the resident white-bellied race is dramatically bicoloured.*

[Left: *Cinclus cinclus cashmeriensis*, Sumdo, Ladakh, India.

Right: *Cinclus cinclus leucogaster*, Chong-Kemin, Kyrgyzstan.

Photos: Otto Pfister]



Dippers are strongly tied to fresh water, rarely being found more than a few metres from its edge. Their favoured aquatic habitats are lotic, rather than lentic, meaning they prefer fast-running streams rather than lakes, in part because stagnant waters do not support the types of larval insect on which they prey. This ***White-throated Dipper*** *is foraging in a classic locale, a clear, well-oxygenated, unpolluted stream with rocks and shallow riffles. Given that these features apply most commonly to stretches of waterway that drop 5-20 m with every kilometre, there is usually a strong correlation between dipper density and stream gradient.*

[*Cinclus cinclus aquaticus*, Mangfall, Germany. Photo: Günter Ziesler]

and, at the same time, the flicking-down of the tail and the blinking of the white upper eyelid. It is from the conspicuous bobbing, or dipping, behaviour that the vernacular name of "dipper" is derived. The two Andean species appear to bob infrequently but, instead, they rapidly flick their wings, thereby revealing a white flash as they expose the white inner webs across parts of the primary feathers.

Other river-inhabiting bird species bob, wag the tail or flick the wings, but this behaviour has often been interpreted as providing a form of disguise, helping to make the bird less conspicuous against the movement of fast-flowing water. In the case of the dippers, however, there is now clear evidence that bobbing or tail-wagging is an interspecific signal to predators that the bird is fit and alerted to the latter's presence. In addition, cinclids commonly exhibit dipping and wing-flicking in courtship displays, territorial disputes and aggressive behaviour towards conspecifics, probably as a signal of fitness.

Three of the dipper species commonly dive in shallow water, often less than 1 m in depth, and they can remain on the riverbed for up to 20 seconds. The majority of such dives, however, are only three to four seconds in duration, and they are often made in series of about five per minute over a period of five minutes or more. How dippers are able to remain fully submerged while maintaining position in torrential water was a subject of much controversy, until filming of individuals in tanks showed conclusively the behaviour involved. Rapid wingbeats essentially keep the dipper in position underwater, and also allow forward movement; although of secondary importance, the legs are used as in a running action to help to propel the bird, or are used for clinging briefly to rocks on the bed. When diving, dippers present a silvery appearance, the result of air bubbles entrained in the plumage.

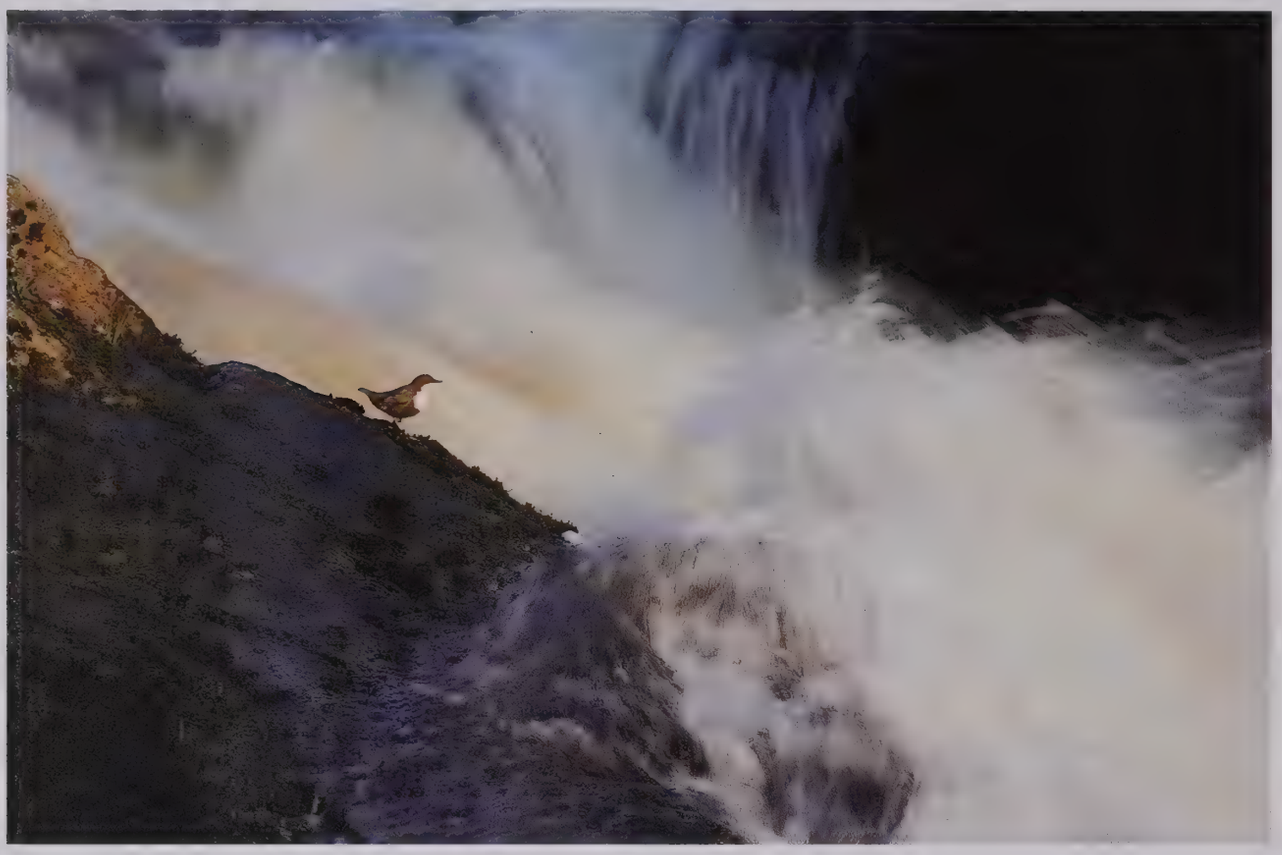
Dippers have many of the physiological adaptations for diving that are possessed by other aquatic birds. For example, there is an immediate drop in the heart rate as a bird plunges underwater, and a further decline during the period of submersion. As the dipper surfaces, the heart rate increases. Dipper blood has a higher concentration of haemoglobin than that found in comparable passerines, allowing for greater oxygen storage.

The members of this family have a fast and direct flight, usually low over the water, and invariably following a watercourse. They fly higher only when pushed to the edge of their territory, at which point they then double back, often flying over the observer. During displays, too, they may fly high into the air. Of course, dippers also gain more height than usual when dispersing over mountain ridges, or on migration (see Movements).

All five of the Cinclidae maintain linear territories along rivers. These range from about 300 m to 2-3 km in length, variation depending on the area of feeding habitat and the abundance of prey animals. Productive rivers have breeding territories that are contiguous, but on marginal rivers there may be unoccupied gaps of unsuitable habitat. Densities vary, therefore. For the White-throated Dipper, the most widely studied member of the family, recorded values per 10 km of river are 0·7-10 pairs in Wales; 1·4-7·7 pairs in Scotland; 1·4-2·2 pairs in south-west Norway; 2·4-2·7 pairs in Germany but four pairs in the Harz Mountains; and 2·3 pairs in Austria. In mountains of the Khamar-Dhaban, in the extreme south of central Russia, dippers are scarce, with a recorded density of only 0·4 birds per 10 km. There may be 1-2 km between pairs, but on frozen sections none occurs. At the other extreme, dippers can reach such high densities, as, for example, outside the breeding season along rivers in the Pacific Northwest of North America, that territories break down and individuals occur within a few tens of metres of each other.

Dippers are territorial when breeding, and often throughout the year. In conditions of extreme cold, however, they may associate together at places where rivers remain unfrozen, and small gatherings may occur in circumstances of unusually high food production. Similarly, they sometimes collect at roosts. Although the majority of White-throated Dippers roost singly or in pairs, some gather at communal roost-sites in the autumn and winter. In the United Kingdom, such sites are often bridges having ledges, girders, crevices in stonework or drainage holes in which the dippers can perch. These roosts can contain nine or ten individuals, although they seldom perch in close contact. During the winter months, when the dippers are no longer roosting close to nest-sites, and when bridges have the thermal advantages of insulation from wind and cold, numbers attending collective roosts increase. No comparable aggregations are known to occur at natural sites, and the birds are often more dispersed in, for example, canyons, under boulders and, probably rarely, in trees.

White-throated Dippers remain faithful to roosting sites, both within and between seasons, throughout their entire life. In stud-



*Like its congeners, the **White-throated Dipper** can survive on waterways with steep gradients, even though this results in an abundance of seemingly inhospitable cascades and white-water torrents. Around these they forage by picking insects or debris from rocks, or by immersing themselves in surprisingly turbulent water. At the other end of the extreme, non-breeding or migrant birds turn up regularly on lowland lakes, mill-ponds and even along the shores of brackish coastal lagoons and rocky beaches. Here they can subsist for some time, but never seem to breed.*

[*Cinclus cinclus cinclus*, south-east Norway. Photo: R. Sorensen & J. Olsen/NHPA]

ies in Wales, for example, fewer than 6% of White-throated Dippers changed roosts from one year to another. Although about 95% of individuals fly less than 3 km, and often less than 1 km, to reach a roost, some arrive from as much as 8 km away, implying knowledge of roost locations well beyond their territories. For some individuals, these movements will be the largest that they make at any time in their life.

Few data exist on the roosting behaviour of other members of the Cinclidae. The American Dipper is known to utilize a range of sites alongside or over rivers similar to those used by White-throated Dippers, and it has been recorded once as roosting in trees.

Ectoparasites are apparently uncommon on cinclids. Few louse-flies (Hippoboscidae) were found on a large sample of Welsh White-throated Dippers, but two widespread species, known from other birds, were collected. These were *Ornithomya avicularia* and *O. chloropus*, the latter representing the first record on a dipper host. *O. avicularia* had already been found on dippers in Germany, where eight of 232 individuals examined were infested, each with just one fly. The feather lice *Philopterus cincli* and *Myrsidea franciscoli* have been collected from White-throated Dippers in Wales and in Germany, and from American Dippers in Colorado.

The relatively low incidence of ectoparasites on dippers may reflect a lack of systematic assessment, but the solitary and aquatic nature of these birds, and their frequent preening and waterproofing of the plumage, may also help to prevent the occurrence of parasites. In this connection, it is of relevance that "anting" behaviour has been recorded for both White-throated and American Dippers.

It may be of interest to add that dippers probably carry a wide variety of internal parasites, ranging from acanthocephalans and cestodal tapeworms to cutaneous trematodes and trypanosomes. Trematodes of the species *Laterotrema cincli* have also been reported in Brown Dippers in Japan. In the United States, the stomachs of ten American Dippers from Oregon contained 441 trematodes identified as a new species, *L. cascadensis*. In Bolivia, two new cestodes of the family Dilepididae, *Cinclotaenia minuta* and *C. boliviensis*, were also recorded from White-capped Dippers. Further new species in this genus, *C. georgievi* and *C. paradehiscens*, have been recorded in White-throated Dippers from the Carpathian Mountains, in south-east Europe.

Voice

All five dipper species have a loud, musical, bubbling and wren-like song, given by both sexes throughout much of the year. Only when feeding young and during the moulting period do they cease singing. White-throated Dippers sing particularly vigorously in September and October, when they are establishing winter territories, and again from January–March onwards, as they establish breeding territories. Dominant individuals probably sing more than do others. The typical song is high-pitched, with a variety of notes, repeated short phrases and a rather simple repertoire, and it can often be heard above the noise of adjacent rushing water in the species' environment (see Habitat). The song of the female can usually be distinguished from that of the male by the fact that it contains a series of whistles and is more scratchy and less melodious or sweet. Most observers agree that the male is more vocal, although some have claimed that both sexes sing equally.

The song is delivered from a rock low in the water, from the edge of ice, from a fence post or low stump, or from the bank. It is also given on the wing. As members of a pair approach each other, they sing in a manner similar to that demonstrated during high display-flights or pursuit-flights (see Breeding). There is a sustained sweet subsong.

Contact-alarm calls of all five species are similar. They also are loud, high-pitched, and sufficiently penetrating to be detected by conspecifics against the noise of a fast-flowing river. Calls are variously rendered as "zzit" or "clink" or similar. The notes are repeated quickly, two to four times in succession, whenever an individual is alarmed, apparently excited or signalling to predators, and also when approaching its nest or when in flight. Flight calls may vary slightly, being a shrill metallic "zlint" or a high musical "zlink". Other calls described for the White-throated Dipper are "zrik" or "zerrrb", uttered in stressful situations, and a rattling "r-r-r-r" or low rolling "zur-r-r-r" greeting at the nest between pair-members and by the female when soliciting, often near the nest. Other calls include "gri gri", given by a dipper emerging from a roost and flying downriver, and a low-pitched "go", "zo" or "kep". Wing-whirring has been reported, as has a rapid slapping sound heard during nest-building.

Nestling White-throated Dippers begin to call from the age of about 6-7 days. As the adults approach the nest and during



Even though waterfalls do not provide ideal foraging habitat, dippers are regularly seen walking about on rocks behind these rushing screens of water, presumably gleaning edible items washed up on the abundant moss. More often, waterfalls are utilized as safe areas for nesting. Although this type of site is by no means typical, dippers will sometimes lodge their nests under the overhanging lip of a waterfall, joining a rather short list of species known to do so. In choosing this location, a ***White-throated Dipper*** *presumably benefits from the fact that its nest is virtually inaccessible to predators.*

[*Cinclus cinclus cinclus*, Ceguilla, Segovia, Spain. Photo: Javier Echevarri]

begging, they emit shrill and squeaky calls, "zip zip zip" or "zi zi zu zu zu", which have been likened to the contact call of a Common Sandpiper (*Actitis hypoleucos*). Fledglings continue to utter begging calls for some days, until they start to forage independently. Juveniles begin to sing in their first autumn, just before completing the moult.

In studies of the American Dipper, it was noted that the adults, immediately after feeding fledglings, frequently sang from a perch within 1 m of the young. This was thought to be an adaptation to the noisy habitat in which they live, which would otherwise possibly have prevented the young from hearing, and thereby learning, the species' song.

Food and Feeding

Upland streams support a rich diversity of aquatic invertebrates, and it is on these that the five cinclids largely depend. Small fishes or salmonid eggs can also be locally important at some times of the year. Dippers spend 45–55% of the daylight hours in foraging, although this proportion increases on less productive streams, during the shorter days of winter, and during the brood-provisioning period.

Foraging behaviour includes wading in riffles or shallow water, probing among pebbles, leaf-turning, gleaning from the wetted surface of rocks, picking prey from vegetation and, very occasionally, aerial flycatching. In particular, the White-throated, American and Brown Dippers are renowned for their habit of diving and swimming for prey in deeper water, frequently submerging completely, although the two Andean species have not been observed to dive in this manner. Dippers deal with large items, such as fish, cased caddis-fly larvae or large dragonflies (Odonata), by beating them on rocks before swallowing them. Diving and wade-picking are the main foraging techniques of White-throated Dippers. Diving is more common during the winter months, when river flows are higher. At times of major floods, however, water turbidity and turbulence appear to prevent effective or selective foraging, and the dippers then feed in smaller side streams or in more terrestrial habitats.

Among dietary studies of passerines, those undertaken on the dippers have been among the most illuminating in terms of avian ecology. This is because dippers take prey from a relatively narrow and easily identified spectrum, food availability is easily assessed, and many potential contrasts in behaviour are observable in the dippers' easily measured habitat. Prey remains found in pellets or faeces, such as insect mouthparts and fish bones, can be counted accurately, and can also be used as a means of establishing the original size or weight of the prey selected. Indigestible items found in faeces are similar in nature to those found in pellets, and there is no evidence that remnants of larger prey are ejected in the regurgitated pellets.

By far the best-known and the most-studied member of the family is the White-throated Dipper, in part as a result of extensive work carried out on this species by S. J. Ormerod and S. J. Tyler in Wales, but also following studies by other workers in Germany, Ireland, Spain, Scandinavia, north Africa and elsewhere. Dietary trends have been quantified over the year, on streams of different quality, and also for both adults and chicks during the nesting period.

There appears to be little variation in the diet of the White-throated Dipper throughout its wide range. This species' prey items are almost entirely of aquatic origin, with the aquatic stages of insects most numerous, but supplemented numerically by molluscs, crustaceans and fish. Fish in particular, and often small sculpins (Cottidae), because of their larger size, can make a disproportionately large contribution to the diet in terms of biomass.

The annual energy requirements for a territorial pair of White-throated Dippers range from 148,000 kJ to 158,000 kJ, depending on whether one or two broods are reared. On the basis of body mass, approximately the same figures apply to the other members of the family. Allowing for assimilation efficiency, these requirements represent around 10·5–11 kg dry mass of food per annum. During the breeding season, the diet is dominated by two insect orders, the Ephemeroptera and the Trichoptera, respectively mayfly nymphs and caddis larvae. On base-poor streams however, where these insects are scarce, stonefly nymphs, in the order Plecoptera, are the most numerous prey. The diet of nestlings changes remarkably with age, providing evidence of very marked prey selection. Small nestlings are fed mainly with mayflies of the genus *Baetis*, but, as the chicks grow, they are fed increasingly with larger limnephilid and hydropsychid caddis larvae. Calculations indicate clearly that any other strategy would be



Flowing water freezes much less readily than stagnant pools, a fact that helps dippers to survive the depths of winter at fairly high latitudes. Unfortunately, even turbulent waterways are liable to freeze when conditions are very severe, whereupon dippers are robbed of their food supply and forced to move downstream. Some even migrate. This Finnish ***White-throated Dipper****, for example, will probably travel up to 1000 km southward each year, perhaps reaching central Europe, or the Atlantic seaboard, where the winters are milder and the streams less often locked with ice.*

[*Cinclus cinclus cinclus*, Finland.
Photo: Markus Varesvuo]

unable to provide sufficient energy for the brood, and the parents compensate by taking increasingly smaller prey for themselves as their chicks grow. Unusual prey are sometimes taken, one example being moth larvae, such caterpillars of the green oak tortrix (*Tortrix viridana*), that fall into the riparian zone where oak trees (*Quercus*) overhang the river.

During the moult period, immediately after breeding, and during the winter months, White-throated Dippers are more opportunistic. While they still feed on mayflies and caddis flies, they now take large numbers of smaller prey, including smaller mayflies such as those in the family Baetidae, but also blackflies (Simuliidae). Fish are important energetically at this time, and in Wales they provide 5–6% of prey items and up to 65% of prey biomass. The bottom-dwelling bullhead (*Cottus gobio*) comprises 80% of fish prey. In some parts of Europe, freshwater shrimps (*Gammarus*) are eaten in large numbers at these times of the year. Moreover, dippers in coastal areas periodically occupy the high-tide line among sea wracks. In a Norwegian fjord, individuals apparently took the marine molluscs *Littorina saxatilis* and two species of *Gammarus*. In west Scotland, dipper pellets found on the coast of the Isle of Rhum contained mostly *Gammarus* and *Orchestia* amphipods. Fish and other calcium-rich prey, such as crustaceans and molluscs, may be particularly important in the late winter and early spring, when reserves of calcium for the forming of eggs become crucial.

In addition to seasonal changes, short-term changes in the environment can also affect the diet. This was demonstrated, for example, during floods on rivers in south-west Ireland, where the diet of White-throated Dippers during base flow was dominated, as is normal, by caddis larvae, especially those of the family Limnephilidae. When the rivers reached storm-flow levels, however, smaller baetid mayflies and blackfly larvae became dominant. The species' diet during the spate period also contained more terrestrial invertebrates, either because the birds took to terrestrial foraging or because terrestrial prey, dislodged by rainfall, contribute increasingly to casual drift in rivers. Similar patterns have been found in Britain, and may be general throughout the dipper's range.

Studies in Wales have addressed not only the diet of the White-throated Dipper, but also its possible impacts on prey abundances. Annual exploitation could reach around 1–2·5 g dry mass per square metre, which, for some highly selected prey, could account for a considerable proportion of annual production. For example, dippers probably take annually up to 0·25–0·3 g per square metre each of stonefly and mayfly nymphs, and the estimated figures for fish and caddis larvae are, respectively, up to 0·8 g and 1·2 g. On the basis of available data on production for cottid fishes, or hydropsychid and limnephilid caddis flies, the influences of this level of out-take on prey density could be substantial. So far, these energetically based estimates have not been tested for White-throated Dippers, but enclosure experiments on American Dippers, carried out by B. C. Harvey and C. Marti indicate that they may well be real.

While many ornithologists concentrate on bird behaviour when undertaking foraging studies, the behaviour of the prey is also crucial. R. K. B. Jenkins and Ormerod investigated the ways in which the behaviour of prey animals altered their exposure to real or simulated foraging dippers. They found that blackfly larvae and hydropsychid caddis larvae lacked effective escape mechanisms, and this could help to explain the heavy predation that they incur. Other families often delayed drift or movement until the dipper's bill made contact, which could well be too late for them to avoid being eaten.

Data on the foraging ecology of the Brown Dipper are available from studies made in Japan, by K. Eguchi, and in the Himalayas of Nepal and India, by S. T. Buckton. In both locations, Brown Dippers foraged for large prey by diving deeply among submerged rocks, and sought small prey by wading and pecking in shallow water. Foraging by diving was seldom observed in the months from May to October, but increased from December to April, the latter months coinciding with the breeding period in Japan. Mirroring the pattern of food-provisioning exhibited by White-throated Dippers, adult Brown Dippers fed themselves mainly by wading, thus taking small prey, but fed their nestlings on items obtained by diving, thus large prey. Specific food items were identified only in the Himalayan study, where the major prey were, in decreasing order of importance, ephemeropterans, mostly baetids, and trichopterans, mostly hydropsychids, followed by dipteran flies, plecopterans and beetles (Coleoptera).

Also an increasingly well-known species, the American Dipper forages on many of the same groups as those taken by the two Old World species. Mayfly nymphs, such as those of the family Heptageniidae, and caddis larvae of several families in

which the larvae are enclosed in a hard case dominate the diet in the breeding season, and these groups, together with fly larvae, mostly chironomids, are eaten in the winter. The distribution of these prey groups appear also to affect the distribution of the dipper. In Pacific coastal rivers, however, seasonal food abundance in the form of Pacific salmon (*Oncorhynchus*) eggs can contribute very substantially to the species' diet. Some of these eggs come from the corpses of spent fish, which have spawned and died in very large numbers after breeding.

Comparatively little is known about the diets of the two remaining cinclids, both of which are confined to the Andes of South America. The White-capped and Rufous-throated Dippers, as their congeners, appear also to feed largely on caddis, mayflies and blackfly larvae, even though they do not plunge for food but, instead, pick items while standing or wading. In addition, they sometimes forage among vegetation on riverbanks, and in Ecuador White-capped Dippers have been observed to take terrestrial prey, such as earthworms.

Breeding

As with all other aspects of this family, the breeding biology of the White-throated, American and Brown Dippers is far more completely known than is that of the two Andean species.

Most dippers are monogamous, the members of each pair defending a linear breeding territory and helping with the rearing of the young. In some cases, the territory is occupied and defended throughout the year. While there may be some potential for reassortment before breeding begins, mate-fidelity between successive years and successive breeding attempts is strong. There is, however, one record of a female American Dipper in Montana which, within a single season, reared a brood with one male and then moved 5 km, to a different watershed, and there raised a second brood with a different male.

Some males are bigamous or polygynous, helping to rear the broods of two, three or, rarely, four females. Usually the associated females are in contiguous territories, but one instance of poly-territoriality is known. The incidence of polygyny varies greatly, both within and among populations, generally occurring in situations where females outnumber males on a river. So far, polygyny has been reported for White-throated Dippers in Germany, Wales and Scotland, and for American Dippers in Colorado, although it may be more widedspread, given the fact that dippers share some of the key attributes of polygynous species, such as sexual size dimorphism. In a study in Colorado, polygyny was practised by four of 31 males, but the intervals between laying dates of females were 14–40 days, so that males were able sometimes to provision more than one nest.

In Wales, DNA "fingerprinting" confirmed that one male was the father of the broods of two different females. It was also found that, in general, polygynous males have greater breeding success than do monogamous males. In polygynous relationships, the breeding success of primary females is not significantly different from that of monogamous females, but secondary and tertiary females suffer a 25% reduction in brood size, probably because of reduced parental assistance from the male. Even though females in polygynous pairings increase their provisioning rate, the total of brood-feeding visits falls when females feed alone. This happens, for example, when the time required for chick-rearing prevents a male from helping at more than one nest simultaneously.

Displays observed for the White-throated Dipper include an advertising display in which the male perches upright, throws back his head, holding the bill more or less vertical, ruffles the white breast feathers, and moves his head slowly from side to side; at the same time, he partly opens his wings and droops them, and fans and lowers his tail. During courtship, the male first approaches the female, but she frequently flies away. Later, as the female becomes more used to the male's attentions, he runs closely around her, dipping and blinking, often rapidly quivering his wings and giving a rattling call. These displays, which are given also by the female, are indistinguishable from those directed at rivals. Partners also perform high display-flights or pursuit-flights, frequently accompanied by song, throughout much of the nesting period. Display behaviour in the other species is less well described, but there are close parallels at least in the Brown Dipper.

All five dipper species build their nests by or over running water. Typical sites include crevices in cliffs or on cliff faces, cliff ledges, similar places behind waterfalls, hollows among roots in the bank and on or under rocks in mid-river. When sites behind waterfalls are selected, the adults fly spectacularly through the curtain of falling water in order to reach the nest. Artificial sites, such as holes or crevices in stone or brickwork of walls and bridges, or girders or other ledges under bridges, are readily used. Bridges and walls provide relatively safe nest-sites, as such structures rarely collapse and rarely become flooded. Indeed, where dippers have a choice of a natural nest-site or an artificial one,



Dippers have unusually dense plumage, an adaptation to an aquatic lifestyle that provides effective waterproofing and insulation against the cold, allowing them to tolerate prolonged exposure to low temperatures. They have been recorded wintering at sites where ambient temperatures regularly drop below -40°C, as long as open water is available. Thus, this ***American Dipper*** *is probably not suffering unduly, despite the encroachment of ice into its territory. Only if its lifeline freezes over will it need to move downslope.*

[*Cinclus mexicanus unicolor*, McDonald Creek, Glacier National Park, Montana, USA. Photo: John Winnie Jr/ DRK]

they often choose the latter. In Switzerland, bridge sites allowed White-throated Dippers to build earlier and to lay eggs earlier than was the case at natural sites. Certainly, on marginal lowland streams where natural sites are limited, bridges enable dippers to breed successfully and to extend downwards from their upland strongholds. Nests are occasionally built in a fork of a tree, in a hole in a riverside tree, on fallen branches over the river or in overhanging branches, and about 6% of nests in Wales were in such sites. Nestboxes erected under bridges or on walls have been utilized by both White-throated and American Dippers, and would probably be used by other cinclids if they were made available to them. Very occasionally, dippers nest in or on buildings away from water, even up to 100 m from it, but such instances are exceptional.

In some territories, a pair may use two or three different nest-sites in the same season or in different seasons, even after having bred successfully at one. Normally, however, dippers exhibit strong fidelity to a particular site within the territory from year to year. Often the same nest, repaired and relined, is used for successive broods, or the pair may build another nest alongside or adjacent to the remains of the first. Where similar and equally suitable nesting sites exist side by side, as with ledges and girders below bridges, a pair may start to build two or three different nests on adjacent ledges before deciding on the final choice. In extreme cases, they may finish two nests and lay in both. Nest-sites can be used traditionally for many years, over 30 years not being unusual, and in one extraordinary instance a particular site has been used by White-throated Dippers for as long as 123 years. Clearly, individuals and pairs do not live that long, so that either some intrinsic attribute of the location or "cultural" knowledge transferred between successive members of breeding pairs must be involved.

Nest construction is much the same for all five cinclid species, and reflects the intrinsic, evolved aspects of building methods and the availability of similar materials in all upland river environments, but also, more importantly, the adaptive value of a warm, waterproof, concealable design. The nest is a large globular structure of moss, with or without the addition of grass, and has an outer diameter of up to 30–45 cm, although it is often smaller. When the site is a cliff face or wall, the birds first build a circular base for the back of the nest, sometimes adding mud to the moss in order to secure the structure better. On ledges, a large platform of moss may be formed on which the rest of the nest is constructed in an upward and outward direction, resulting in a miniature "haystack". Where the nest is in a confined space, as in a crevice or in a nestbox, it may lack the dome and sides, being no more than a mossy base and inner cup. The cup is made from roots and grass and is lined usually with leaves, but occasionally with hair. In Russia, feathers have been recorded as the lining. In Europe, the White-throated Dipper's preferred material for nest lining is dry beech (*Fagus sylvatica*) or oak leaves, although leaves of ivy (*Hedera helix*), bramble (*Rubus*), birch (*Betula*) and willow (*Salix*) are also used, as occasionally are dry bracken (*Pteridium aquilinum*) fronds. American Dippers have been reported as using cottonwood (*Populus tremula*) leaves and ponderosa pine (*Pinus ponderosa*) needles in the lining of their nests, and Rufous-throated Dippers as using Andean alder (*Alnus acuminata*) leaves, as well as morphologically similar pieces of paper and plastic. Strips of plastic have also been found in a nest of the other Neotropical species, the White-capped Dipper. Brown Dippers in Nepal lined the nest with leaves of Himalayan alders (*A. nepalensis*).

The circular or elliptical entrance hole is low down at the front of the dome, and faces downwards, almost invariably over running water. Nests of White-throated Dippers in Europe are usually located less than 3 m above the stream or river, and 60% of nests in Wales were only 1–2 m above water. They may be only a few centimetres above water when the stream is no more than a stable trickle, but rivers in flood in the spring rise and fall dramatically, and nests need to be above high-flood level. Some nests under railway bridges and on buildings are up to 10 m above the river. Nests of American Dippers in the Rocky Mountains are generally higher up, on average, than are those of White-throated Dippers in Europe. F. E. Price and C. E. Bock, who studied a population of American Dippers in Colorado, considered that high, inaccessible and wide ledges were the best-quality nest-sites because they were safer from predators and flooding, the latter being a major cause of nest failure.

Both sexes can be involved in the building of the nest, but it is the female that usually completes the cup and adds the lining. Sometimes she alone does the building, or the male may bring moss and other material to the nest vicinity, where the female



*The **White-capped Dipper** is one of two South American forms, both of which glean almost all their food by picking prey from rocks, or from just beneath the waterline. In so doing they regularly immerse their heads, sometimes becoming temporarily submerged under fast-flowing water, but they never seem to dive beneath the surface, unlike their congeners. Given that they spend so much of their lives close to the waterline, it comes as no surprise that their toes are long and strong, and their claws curved and sharp, attributes that help all dippers to gain purchase on steep or slippery rocks.*

[*Cinclus leucocephalus leuconotus*,
Otun Quimbaya,
Colombia.
Photo: Otto Pfister]

collects it and incorporates it into the structure. In the case of the White-throated Dipper, either the female or both members of the pair build, and the same applies generally to the American Dipper, although some authors report that the male of the latter species undertakes only a minor share of the work or none at all. G. Shaw found that nest-building in Britain required an average of 28 days, with a range of 25–32 days, whereas K. W. Perry recorded periods of 10–21 days in Ireland. Construction periods of 9–28 days, with an average of 18 days, and of 5–45 days have been reported in different studies in Germany, and durations of 6–39 days in Switzerland. Cold or wet weather can extend the length of time taken for building, and nests built early in the year are formed over a longer period of time than are later ones. When the breeding season is short, as at high altitudes, or when the first nest has failed, construction work may be more rapid.

For all species, the basic tendency is to breed very early in the spring. In the Northern Hemisphere, breeding starts from February or March, and the Brown Dipper sometimes begins earlier, in January or even December. The situation in the Andes is less well known, but the Rufous-throated Dipper appears to commence breeding at the end of the austral winter, from September onwards. Nests of White-capped Dippers have been found in February and March in Venezuela, in the north of the species' range, but farther south breeding seems to take place over a wider period of the year, with eggs, nestlings and fledglings reported variously from September through to July from south Colombia southwards to Peru and Bolivia.

Exact timings of breeding, however, vary from one location to another, owing to a number of ultimate influences and proximate cues. For example, in far northern populations, short winter day length and the consequent need for migration results in breeding being delayed in some regions, such as in north Scandinavia, by comparison with those farther south. River hydrological regimes, surprisingly predictable in seasonal locations, also exert an effect. In temperate, maritime areas such as Britain, breeding begins as the winter risk of high rainfall and flooding declines, from February or March onwards. In contrast, dippers in alpine environments need to avoid floods generated by snow-melt, while Brown Dippers in the Himalayas must avoid both snow-melt and subsequent monsoonal rainfall and probably breed before both. Annual cycles of food abundance probably also have effects, and the emergence of large benthic invertebrates as adults from spring onwards depletes rivers of key prey, thus favouring early breeding. Finally, dippers need to fit other requirements, such as moult, into the annual cycle while conditions are still favourable for easy feeding, and this fact alone can truncate the breeding season. Proximate influences include temperature and actual food abundance, with low temperatures and reduced food abundance tending to delay breeding sometimes until unfavourable periods. In Wales and Scotland, for example, White-throated Dippers at acidic sites where invertebrates and calcium-rich prey were scarce laid significantly later than did pairs at good-quality sites, and this had major consequences for post-fledging survival.

The results of case studies reflect this array of features affecting the timing of breeding. In Britain and Ireland, nest records from the British Trust for Ornithology reveal that White-throated Dippers lay from late February to mid-June, with a peak in laying in late March and early April. There is one record of a clutch of eggs being incubated in the second week of February. In south Wales, laying reaches a peak in the first week of April, with 52% of 364 clutches started before 7th April. In a wider study area in middle and south-east Wales, where 1263 clutches were found 1978–1993, there was a peak in laying in late March and a smaller but clear second one in early May. The breeding season on the River Esk system, in southern Scotland, begins significantly later than it does among populations farther south and west in the British Isles. In Austria and Germany, the earliest clutches of White-throated Dippers are laid in the first half of March, whereas farther north, in Norway and Finland, clutches are not laid until April or early May and, in the northernmost areas, not until mid-May. Similarly, in parts of Russia, chicks from the first and only brood do not leave the nest until mid-July, indicating laying dates in early June. The American Dipper lays earlier at lower altitudes in North America, as do White-throated Dippers in Europe. In Austria, Germany and the former Czechoslovakia, White-throated Dippers lay 5–6 days later for every 100 m increase in altitude, while the corresponding figure in the Swiss Alps was as much as 18–19 days later per 100 m.

Climates are non-static, as is now realized, owing to local influences such as urbanization, to larger periodic variations such as the North Atlantic Oscillation and the Pacific Oscillation, and to progressive climate change. Any of these could have an effect



*Anyone watching an **American Dipper**, and unacquainted with the details of its lifestyle, is soon likely to be taken aback when its head disappears underwater. In fact, underwater foraging is the most famous aspect of dipper ecology, and the trait which separates them from all other passerines. The need for underwater vision and waterproofing has resulted in a few unique adaptations, including specialized lens musculature, nasal flaps and hydrophobic plumage. Moreover, the feathers are frequently preened with oily secretions from the uropygial gland, which in dippers is unusually large.*

[*Cinclus mexicanus*, Kern County, California, USA. Photo: Brian E. Small]



Anyone surprised when a dipper's head vanishes underwater is likely to be astonished when, with a quick dip of the body and thrust of the legs, the bird disappears altogether. Not only does it dive, but once underwater it swims comfortably, propelling itself downward with flipper-like wings. When this ***White-throated Dipper*** *reaches the bottom it will forage there for up to 20 seconds, or more, before returning to the surface with cork-like buoyancy. It was once thought that it held itself down by clasping rocks and pebbles with its feet, but it has now been proven beyond doubt that the wings do most of the work.*

[*Cinclus cinclus.* Photo: Konrad Wothe]

on dippers. J. P. W. Scharlemann estimated the laying dates of White-throated Dippers from collecting dates of museum egg collections; although the findings were subject to some uncertainty, the dippers have started laying progressively earlier over the past 150 years, with the onset of breeding correlated significantly with mean March temperatures. In an intriguing phenological study in Switzerland, J. Hegelbach investigated the timing of laying by this species along rivers and streams flowing into lower Lake Zurich. He found that the dippers initiated breeding in February or March of each year, but actual first dates varied annually, from 9th February, in 1995 and 1997, to 9th March, in 1992. The median date for the first 25% of all broods advanced significantly with increasing February water temperatures and with February air temperatures, and was significantly correlated with the flowering of two early plants, the coltsfoot (*Tussilago farfara*) and the wood anemone (*Anemone nemorosa*). Comparison with historical data shows that White-throated Dippers at Lake Zurich now begin breeding earlier in the year than they used to in Britain, Germany and elsewhere in Switzerland. In this case, the strongest explanatory factor was increased water temperatures caused by urbanization. The effects of these higher water temperatures, through accelerating the life-cycles of aquatic invertebrates, must have been greater than the direct climatic effects on the dippers' condition.

The eggs of all dipper species are white, in keeping with those of many other avian species that use domed nests or nest in cavities. They are subelliptical, smooth and glossy. The eggs of the large Brown Dipper are the heaviest and largest, and those of the small Rufous-throated Dipper are the lightest in weight. Egg shape varies somewhat within species. Further, the eggs of White-throated Dippers in Wales, Scotland and Norway are thinner-shelled and of lower weight at acidic sites than they are elsewhere, probably because of a relative scarcity of calcium-rich prey.

White-throated Dippers lay 3–6 eggs, and much less often one, two or seven eggs, usually, but not always, at one-day intervals. Clutches of four and five eggs predominate. Similar figures apply to the Brown and American Dippers. The few data available for the two Andean dippers suggest a smaller clutch, two eggs being normal for Rufous-throated Dippers in Argentina and Bolivia. Mean clutch sizes of White-throated Dippers, derived from large study samples, are 4·2–5 eggs. Slightly larger clutches are laid in Poland, the Swiss Alps, some areas of Germany and south-west Norway, where the average was 4·9–5·1 eggs, than in Britain in general, in Wales or in south-west Ireland, the respective means for the last three being 4·4, 4·7–4·8 and 4·16 eggs. In Wales, 67% of clutches were of five eggs and 24·3% of four eggs. First clutches started in March or April were significantly larger than were later ones, mainly re-layings or second clutches. In Europe, seasonal reduction in clutch size is common, as in Germany, Switzerland and Britain, but not universal, as it was not recorded in studies on the Esk system, in Scotland. There is no clear altitudinal effect on clutch size, but in Wales individuals at better-quality sites lay larger clutches than do those at poorer acidic sites, probably reflecting differences in food availability and quality. In Germany, White-throated Dippers on south-facing slopes produced larger clutches than did those on north-facing slopes, a fact which W. Zang related to differences in food supply. In Scotland, clutch size did not differ with parental age.

In the case of the three better-known species, the White-throated, American and Brown Dippers, the female alone incubates. Very occasionally, males have been reported as incubating or as covering the eggs in the partner's absence. Females sometimes sit on eggs before the clutch is completed, possibly incubating from the penultimate or earlier eggs, as asynchronous hatching has been noted on a few occasions for both the White-throated and the American Dippers. Incubation usually lasts for 16 or 17 days, sometimes a day or two fewer, but the period can be longer at higher altitudes and for earlier clutches. Furthermore, females have been known to sit for up to 42 days on infertile eggs, before abandoning the clutch. During the incubation stage, the male may feed his mate on the nest and he spends much of his time, 40% or more, in guarding the nest or, rather, the incubating female against intruding males. Neighbouring males have been reported as removing eggs or young, a strategy that would increase their chances of copulating with the female.

Newly hatched dippers, being passerine birds, are naked, are incapable of regulating their body temperature and are totally



By adopting an underwater lifestyle dippers are able to forage on prey items unavailable to other passerines. They commonly feed on large numbers of aquatic larvae, which form their staple diet through the summer months. Using the bill, they dig among underwater pebbles and poke about in rocks, extracting invertebrates from their hiding places. In winter, they are forced to take a wider variety of prey, including a few fish, as illustrated by this ***American Dipper****. They have been noted taking the fry or eggs of commercially important salmonids, but not in significant numbers.*

[*Cinclus mexicanus*, Kern County, California, USA. Photo: Brian E. Small]

dependent on both parents for food. The female broods them almost continuously during the first days, leaving the nest only for a few minutes after 1–2 hours of brooding. The male thus brings most of the food in these early stages, either feeding the chicks directly or passing food to the female. Brooding periods decrease as the nestlings grow, generally ceasing when the young reach 12–13 days of age. With monogamous pairs, both parents then play an equal role in provisioning the chicks. When the chicks are young, the adults enter the nest in order to feed them. There is then a "carousel" system of feeding, whereby the chick that has just been fed retreats, or is pushed, to the back of the nest, its place being taken by the one immediately behind it. As the chicks grow, they beg and call at the nest entrance, where they reveal the orange-yellow gape edged with white flanges. It seems that older chicks, presumably because they are noisy, are more vulnerable to predation that are younger ones. The adults remove faecal sacs from the nest and drop them into the river, but when the chicks are big enough, at 9–10 days or more, they defecate outwards from the nest. Faecal sacs sometimes accumulate on rocks or in water below the nest, and the adults sometimes dispose of fallen sacs, at least early in the nestling period. One pair of Rufous-throated Dippers feeding well-feathered young, at least 18 days old, was still carrying away faecal sacs.

The nestling period, from hatching to fledging, lasts for about three weeks or more. Young White-throated Dippers remain in the nest in Britain for 20–24 days, the average being 22 days; the corresponding figures for Germany are 23–27 days, and a mean of 21·5 days is recorded in Switzerland. The nestling period of American Dippers is similar, at 23–28 days, while that of Brown Dippers is 21–24 days. Chicks will leave the nest prematurely if disturbed by a real or potential predator. In such circumstances they "explode" from the nest, dropping or plunging into the river, where they swim and dive expertly. They soon scramble out on to the bank and hide among rocks, vegetation or tree roots, where the adults will continue to feed them. For this strategy to have evolved, it is obvious that some youngsters must survive. The alternative, that of being eaten by a predator, clearly has no survival value.

Brood sizes of White-throated Dippers generally follow the same temporal and geographical trends as those detailed for clutch sizes, although broods are generally slightly smaller than clutches owing due to a small number of egg failures or early mortalities. Broods are larger at higher latitudes and, in Wales, broods were larger earlier in the season than later. This pattern has sometimes been repeated in other European studies. Brood size is also affected by territory quality, notably prey abundance; broods are smaller on acidic streams, where prey are scarce, than on circumneutral streams. In south-west Ireland, the mean brood size at fledging was 3·48 young per successful pair.

Dippers have relatively high hatching and fledging success, presumably because their nests, located over fast-running water, are often inaccessible to many predators. The domed structure of the nest also makes it more difficult for predators to see eggs or chicks than is the case with open cup-nests, and the large mossy structures are often camouflaged. Hatching success of the White-throated Dipper in British and European studies varies from 61% to 76%, and fledging success from 81% to 94%. Overall breeding success, in terms of the percentage of nests that produce at least one fledged young, ranges from 56% to 68·4%, and the mean number of young produced per nesting attempt varies from two to four. All of these measures of success are, of course variable both annually and seasonally. In Wales and elsewhere, first broods are generally more successful than are second broods. In the Swiss Alps, on the other hand, nests were more successful as the season progressed, this being due to the effects on earlier nests of flooding following snow-melt or of predation. Among White-throated Dippers studied in Scotland, parental age was found to influence breeding success: pairs in which both partners were full adults enjoyed greater success than did pairs in which at least one member was a first-year individual. The three better-known species usually start breeding at one year of age, although some males may not breed until they are two to three years old.

The incidence of second broods is very variable. In general, double-brooding requires that first attempts are completed early in order to allow sufficient time for a further attempt to be made. This possibility is clearly limited for later-breeding pairs at high latitudes, at high altitudes or on poor-quality streams, and all case studies bear out these trends. On high-quality streams in the

catchment of the lower River Wye, in Wales, about 24% of White-throated Dipper pairs had second broods and in some years, on particularly good-quality streams, 80–90% might attempt a second brood. In contrast, pairs at sites on acidic rivers rarely made a second attempt. Similarly, in eastern Scotland, the incidence of second broods was much higher on the lower reaches of the River South Esk, which had abundant prey, than on upriver stretches. In Norway and Sweden, where early breeding is probably limited by day length, as few as 5–6·5% of pairs had second broods. In Switzerland, the likelihood of second broods was less at high altitudes, above 1300 m, while at lower altitudes the incidence of double-brooding varied from 3% to 38%. Likewise, Austrian dippers breeding at elevations above 500 m rarely had a second brood. In other central European studies, 10–49% of pairs had second broods.

The duration of the breeding season and the lengthy incubation and fledging periods make a third brood almost impossible. In some instances in which three broods have been claimed, it is probable that one or more broods failed at an early stage, encouraging the adults to make a further attempt. Nevertheless, there are several records of White-throated Dipper pairs in Germany successfully rearing three broods.

American Dippers are frequently double-brooded. Indeed, in a celebrated study area in Colorado, Price and Bock recorded that about 40% of pairs had two broods, although the number attempting a second brood varied annually, from 5·5% to as high as 70%. These figures, however, are inflated, because the researchers included not only genuinely double-brooded pairs, but also pairs which re-laid following failure of first nests. Brown Dippers had only one brood in Japan, but in other parts of their range they are not uncommonly double-brooded. It seems very likely that the two Andean species may also rear two broods in a season, but there is insufficient information to enable this to be confirmed.

Once fledged, young dippers are fed by both parents for 1–2 weeks, the parents sometimes diving the brood so that each tends one or two juveniles. Some authors have found that females fed the juveniles more than did the males. In cases when the female lays a second clutch during this post-fledging period, however, the male may play a larger role. Newly fledged White-throated Dippers sit quietly on rocks or pebble shoals near the nest, waiting for a parent to bring food. As a parent approaches, the young move towards it and flutter or quiver their wings, calling loudly and begging. Those juveniles which gain more food from begging generally gain more energy than do those which attempt to feed themselves. Sometimes they peck rather inexpertly at prey, especially small blackfly larvae on rocks. If danger threatens, the youngsters dive or flutter away to hide among rocks or tree roots.

With increasing age, young dippers devote longer periods to foraging independently, and their movement, flying and foraging skills improve markedly. Two to three weeks after leaving the nest, they are able to use a variety of foraging techniques and can survive on their own. The time required to gain independence is variable, however, even within broods. The young often remain within the parents' territory until they have completed the post-juvenile moult, at four to six weeks after fledging (see Morphological Aspects).

Post-fledging survival is particularly difficult to assess in any population study. This is partly because of the difficulty of retrapping sufficient survivors, but also because of the difficulty in separating post-fledging survival from overall nest survival. In Wales, Ormerod and colleagues monitored the fate of White-throated Dipper chicks from 743 broods in relation to brood size, time of hatching and territory quality. For all brood sizes, post-fledging survival varies through the breeding season, and most survivors are from nests in the peak breeding period, implying that dippers time their breeding correctly. This effect was so strong in this study that it almost exactly cancelled out the benefits in fitness of double-brooding. This implies that there is a fine balance between the benefits to adults of breeding once in the optimum period, in late March and early April, and those of breeding twice at suboptimum periods, very early and again later in the season. There is also evidence that the most common brood size among Welsh dippers, of four, is also the most productive, although, again, this changes subtly through the season. Territory quality, particularly with regard to the negative effects of acidity, probably has major impacts on survival by delaying breeding, and hence fledging, such that this takes place in periods when post-fledging survival falls dramatically. The reduced weights of fledglings at acidic sites will also reduce their survival chances.



*Pair-formation behaviour in the **White-throated Dipper** is relatively modest. Both males and females vocalize strongly, often giving rattle calls and occasionally an unexpectedly musical and complex song. They also chase each other a good deal, and signal at close range with two unusual displays. One of these involves the frequent and conspicuous blinking of white eyelids, and another is the abbreviated curtsy which gives rise to their English name. They dip their bodies quickly and repeatedly, fluttering their wings when especially excited.*

[*Cinclus cinclus cinclus*, Bagà, Spain.
Photo: Jordi Bas]



*In the **White-throated Dipper** copulation is usually preceded by solicitation. To communicate her willingness, the female bows and crouches low in submissive posture, with wings aquiver. The male may ignore this signal for some time, or the female may rebuff his advances, but eventually he mounts in ungainly fashion, maintaining his balance by beating his wings. The whole process lasts a few seconds at most, after which both pair members dally in the vicinity with much excited ruffling of feathers, dipping and blinking; or else they fly away calling loudly, or even singing.*

[*Cinclus cinclus cinclus*, Bagà, Spain. Photo: Jordi Bas]

Unless events of predation are witnessed directly, something that rarely happens, it is notoriously difficult to assess which species of predator are implicated. Observers more often reconstruct events from putative clues, and many records are also biased towards causes that are more likely to be detected. Small mammals, notably brown rats (*Rattus rattus*), appear to be one of the main predators of eggs and chicks of White-throated Dippers. In an analysis of British nest records, Shaw attributed 60% of nest failures to rats, while Perry found that rats caused up to 75% of "natural" nest failures in Ireland. Feral American minks (*Mustela vison*) are probably also important predators in several parts of Europe, but the scale of any effect that they may have is unknown. In Ireland, they were thought to be one of the major causes of mortality of young dippers either just before or just after fledging. The native European mink (*M. lutreola*) also causes some nest losses, as do stoats (*M. erminea*), weasels (*M. nivalis*) and otters (*Lutra lutra*), and a dormouse (*Eliomys quercinus*) was reported as taking a brood of chicks in Poland. Some newly fledged dippers fall victim to domestic, feral or wild cats (*Felis*). Of 77 British-ringed White-throated Dippers found dead and for which the cause of death was known, about 43% had been killed by cats, although this figure included adults as well as juveniles. Corvids, especially Carrion Crows (*Corvus corone*), Eurasian Jackdaws (*Corvus monedula*), Eurasian Jays (*Garrulus glandarius*) and Common Magpies (*Pica pica*), are all known predators of White-throated Dipper eggs or chicks. Juveniles and adults are vulnerable to predation by Eurasian Sparrowhawks (*Accipiter nisus*), Merlins (*Falco columbarius*), Common Kestrels (*Falco tinnunculus*) and Peregrine Falcons (*Falco peregrinus*), and Tawny Owls (*Strix aluco*) occasionally take full-grown dippers.

In North America, predators of eggs or chicks of American Dippers include martens (*Martes*), striped skunks (*Mephitis mephitis*) and long-tailed weasels (*Mustela frenata*), and bushy-tailed woodrats (*Neotoma cinerea*). Water snakes and even brook trout (*Salvelinus fontinalis*) are known to have taken fledglings.

Information on predators of other cinclid species is extremely limited. An Andean Pygmy-owl (*Glaucidium jardinii*) was suspected of having eaten a female White-capped Dipper on its nest. Interestingly, A. F. Kovshar believed that Brown Dipper nests were almost inaccessible to terrestrial and aerial predators.

Brood parasitism appears not to be a particularly widespread source of problems for the Cinclidae. Cuckoos (*Cuculus*) only very rarely parasitize nests of White-throated Dippers, although Brown Dippers seem to be more commonly exploited as cuckoo hosts.

Northern fowl mites (*Ornithonyssus sylviarium*) occasionally infested broods of White-throated Dippers in Wales, but the nestlings fledged successfully. In Germany, the same parasite species has been found on feathers and in the nostrils of dippers, as well as in their nests, and in some instances infestation of broods can be high. One nest of an American Dipper contained about 400 northern fowl mites. Many other mites can occur in cinclid nests. The best examples are from seven nests of the White-throated Dipper in Wales, in which 54 mite species, from 46 genera, 27 families and four orders, were found. The array of species included several pests of stored food, species able to invade houses, species known to produce respiratory allergies, and species usually found in moss or leaf litter. Examples included *Tyrophagus putrescentiae*, *T. longior*, *T. palmarum*, *Acarus farris*, *Dermatophagoides farinae* and *Kleemannia plumigera*.

Several fleas, especially the moorhen flea (*Dasypsyllus g. gallinulae*) and the hen flea (*Ceratophyllus gallinae*), were commonly found in White-throated Dipper nests in Wales, and attacks on dipper nestlings by moorhen fleas were reported as a main cause of failure of first broods in the Swiss Alps. In the Neotropics, likewise, nests of White-capped Dippers can be infested with fleas, as shown by a total of 592 fleas found in the nest of a second brood. Other ectoparasites include blowfly larvae (*Protocalliphora*), which suck the blood of nestlings. Such larvae have been found on nestlings of American Dippers in California, Utah and Colorado, very occasionally causing mortality.

Individuals captured and recaptured during ringing programmes have allowed very detailed assessments of survival and population dynamics, some of these studies being classics in ornithology. Because they have linear territories, and are easy to capture or observe, and because the recording of environmental variation in dipper habitats is not difficult, the cinclids have been "model" species for the development of novel techniques and methods. First-year mortality of young White-throated Dippers is 60–65% and annual adult mortality is 40–50%, so that some



*In the **White-throated Dipper**, as with other members of the family, the basic breeding system is monogamy. Even so, many cases of bigamy (and rarely trigamy) have been reported, especially on productive waterways where separate nests are regularly less than 100 m apart. In most cases both sexes build the nest, although the contribution of polygamous males is often much reduced. The finished product is a large, almost circular, domed structure, around 20 cm high, built largely of moss, with an inner layer of grass, stems and rootlets, and a lining of leaves. It is almost invariably built by or over running water, usually on rocks or ledges.*

[*Cinclus cinclus cashmeriensis*, Rumbak Valley, Ladakh, India. Photo: Otto Pfister]

individuals can live to about eight years. Remarkably similar values were obtained by Price and Bock for American Dippers, with annual adult mortality of 38–52% and first-year mortality of 68–78%.

Among adult White-throated Dippers, the time when most deaths occur is the period following breeding, when the body mass is lowest and the stress of rearing young probably apparent. Survival is variable in both space and time, however, and in northern populations, for example, reduced winter temperature diminishes the over-winter survival of both adults and young. B. E. Sæther and colleagues have used this remarkably robust observation, derived from 4000 marked individuals, to suggest that future climatic warming might lead to a population increase. This effect cannot be generalized, however, and in more temperate areas of Europe, such as France and Britain, mortality increases in years with marked floods or droughts.

Movements

Being so well adapted to a wide temperature range, many dippers throughout the world are relatively sedentary over the annual cycle. This includes the winter period, provided that there is sufficient daylight in which to feed, and provided that sufficient areas of river remain unfrozen to allow access to food.

True long-distance migration is, however, exhibited by White-throated Dippers breeding in the Urals and in Fennoscandia, where intolerably short winter days force movement. In this latter case,



*Incubation in dippers is almost invariably undertaken by the female alone, although males will occasionally attend to the eggs in her absence. Males are also reported to provision the incubating female with food, although she usually leaves the nest to forage independently. More often, males stand guard in the vicinity of the nest during the breeding cycle, possibly keeping an eye out for intruding males or predators. On occasion, males will even make direct flights at humans standing too close to the nest. The eggs of this **Brown Dipper** will probably hatch after a period of 19–20 days.*

[*Cinclus pallasii pallasii*, south Ussuriland, Russian Far East. Photo: Yuri Shibnev]

dippers fly south-eastwards each winter into southern Finland, Latvia, Estonia, Denmark, the Netherlands and Belgium, and some even reach Britain. Their annual cycle of weight gain is adapted to accommodate this migration, for example in allowing sufficient gain in reserves to enable the birds to make the return flight across the Baltic in spring.

Other regular migratory movements are made more locally, even within watersheds, where some members of the population, but not all, vacate higher-lying breeding territories during the winter months. The reasons for the variation in this strategy, and its dynamics and consequences, are still poorly understood, but the best-documented examples involve the American Dipper. In the Chilliwack watershed of British Columbia, in south-west Canada, about 65% of American Dippers are sedentary and 35% are migrants. Residents, in this case those at lower elevations, gained the advantage of earlier nest initiation, a greater chance of second broods, greater nest success and larger annual productivity. The migrants, those breeding at higher elevations, demonstrate a very marked fidelity to wintering locations. Similarly, in the Front Range of Colorado, in the United States, the proportion of individuals vacating higher-lying watersheds appeared to be large, perhaps over 70%.

In the Old World, some White-throated Dippers in the south Russian mountains of Khamar-Dhaban make post-breeding movements to more southerly regions, while others remain on open river channels and brooks that do not freeze. At the beginning of May, the migrants move back into the mountains, first concentrating at river mouths. Males then sing from perches on the edge of ice or on rocks. Likewise, some Brown and White-throated Dippers in the Himalayas are altitudinal migrants, whereas others can still be found at over 4500 m even in December, and the species is probably far less migratory than are other river-dwelling passerines in this region. Brown Dippers are believed to be partially migratory in north-east China, but they are essentially sedentary in Japan. Some Japanese individuals make vertical movements in response to low temperatures, and the species has been recorded in the winter months at sea-level on the Shiretoko Peninsula, in north-east Hokkaido. A similar phenomenon is evident in western Europe, where White-throated Dippers in the UK may move down to the coast in harsh weather conditions.

Given that dippers generally demonstrate high fidelity to breeding sites, the only other major movements that they make during their lifetime occur during the period of juvenile dispersal. In the case of the White-throated Dipper in Ireland and Britain, where populations are largely sedentary, juveniles begin to leave the natal territory within weeks of fledging, and movements are largely complete by the autumn, in September–October. Following the well-established pattern of other passerines, natal dispersal is sex-biased, females moving farther than males; young females move a median distance of 5–8 km and, occasionally, up to about 45 km, whereas males disperse over an average distance of 3–5 km. Only around 8–10% of males leave the natal watershed in making such movements, while 20-25% of females cross one or more watersheds. Generally similar figures on natal dispersal are apparent from studies of the American Dipper, albeit from smaller samples. The mean distance travelled by juveniles of this species is about 18 km, and approximately 10% of all ringed individuals were subsequently observed in different watersheds from the ones in which they hatched.

Relationship with Man

The charismatic underwater abilities of the Cinclidae, their special adaptations and "flagship" studies of their ecology have combined to give dippers a public image that is overwhelmingly positive. Moreover, their widespread use of man-made structures as nest-sites, sometimes even within urban areas, means that contacts between people and dippers are not uncommon.

In most European countries, the White-throated Dipper is now fully protected, but until the start of the twentieth century the species carried a bounty in such countries as Germany and Scotland. It was perceived, erroneously, that the dippers might have an adverse effect on fish populations, and on one Scottish estate alone 548 White-throated Dippers were killed between March 1831 and March 1834. Even today, some landowners will still not tolerate dippers on their waters. In North America, predation by American Dippers on fish eggs has also led to persecution of the species. In this case, impacts on wild salmonid populations are unlikely, however, because the fish fry and eggs taken by the dippers are, in any case, subject to major natural mortality. At fish farms, any predation by dippers and other bird species can easily be prevented by protecting the rearing ponds with netting. Finally, many of the fish eaten by cinclids, at least by White-throated Dippers, are of species other than salmonids.

Some hunting of White-throated Dippers by man, either for sport or for food, still takes place in the Mediterranean region and in north Africa. The Berbers in Morocco apparently



When the time comes for provisioning, both male and female ***White-throated Dipper*** *contribute almost equally, with a heavy input by males over the first few days when females continue to brood the newly hatched nestlings. On British rivers, young dippers are initially fed a diet largely comprising* Baetis *mayfly larvae, except on acidic waterways, where stonefly larvae are the main prey. As days pass, and chick weight increases, the adults bring more limnephilid and hydropsychid caddis larvae, as well as adult insects.*

[*Cinclus cinclus*, Scotland. Photo: Michael Callan/ FLPA]



*According to behavioural research, broods of **White-throated Dippers** initially adopt a carousel system of egalitarian provisioning. This involves each nestling moving to the back of the nest as soon as it is fed, allowing a hungrier sibling to receive food at the next visit. This seems suspiciously altruistic, and is duly replaced with a more normal system of cut-throat competition after about seven days. Thenceforth, whenever they see or hear an adult, all the young jostle at the entrance, clamouring loudly and signalling their hunger with brightly coloured gapes.*

[*Cinclus cinclus cinclus*, Redes Natural Park and Biosphere Reserve, Asturias, Spain. Photo: Isolino Pérez]

regard these birds as having aphrodisiacal properties. Elsewhere, there is little evidence that man has any major impact on the Andean or Brown Dippers through direct persecution, although indirect impacts through habitat modification and pollution are more likely.

The role of dippers as biological indicators has been increasingly highlighted since work carried out by Ormerod and colleagues during the 1980s–1990s, in Wales, provided the first evidence that birds could be affected by acid ran. Extensive studies of White-throated Dippers revealed that density, territory size, laying dates, clutch size, shell thickness, egg mass, brood size, the incidence of second broods, total productivity, nestling growth and adult condition were all markedly inferior on acidified streams than on better-quality, or circumneutral, streams. The differences were striking. At acidic sites, for example, pairs began laying 13–22 days later than they did elsewhere, clutch and brood sizes were smaller by more than 0·5 eggs or chicks, and densities were often 10–50% of those on good-quality streams. Many of these results were subsequently replicated in other parts of Europe, and new evidence showed that the palisade layer of eggshells from acidified areas was almost 11% thinner than that of shells from non-acidified areas. Additional British evidence demonstrated that populations declined when streams became more acidic, and also that population distribution matched the expectation of the effects of acid deposition. The process involved also became clear. In what are now some of the best-known examples of pollution impacts on streams and rivers, acidification reduced the abundances of key prey types for dippers, including mayflies, caddis larvae and, crucially for pre-breeding females, also calcium-rich prey such as molluscs, shrimps and fishes. Blood calcium was significantly lower in both males and females at acidic sites in the pre-breeding period than it was at circumneutral sites, whereas alkaline phosphatase, a major enzyme in calcium metabolism, was elevated. Serum calcium was also lower in young nestlings at acidic sites, while bone growth appeared retarded. Pre-breeding individuals on acidic streams had to increase foraging time markedly, at the expense of resting and self-maintenance, in order to maintain energy gain. Finally, no other explanation for these effects, such as pesticides or PCBs, was apparent. By 1995, the last major survey of acidification effects on White-throated Dippers showed that populations had probably thinned out even further.

Ten years later, in the middle of a new decade, there is now unequivocal evidence that acid deposition over Europe has decreased considerably, and average river quality is improving slowly. Biological recovery, however, has been partial and patchy, and probably offset over extensive areas by the continued effects of acid episodes. Full recovery of White-throated Dipper populations to pre-acidification levels is therefore still decades away.

The realization that all the dippers had general value as indicator species, coupled with measurements of contaminants in eggs made in conjunction with studies of acidification, has led to much further research. Their value as indicators of a wide range of contaminants, for example, reflects the position of dippers as high-ranking predators in river food webs. Moreover, observers can be relatively certain that any substances contained in eggs or tissues must have been accumulated within a well-defined territory: contaminant sources have sometimes been pinpointed with accuracy. More recently, dippers are being seen as important indicators of the physical quality of river habitats.

In Wales, failed and deserted eggs have been analysed for well over 20 different pollutants, including mercury, DDT and its metabolites DDE and TDE, lindane, hexachlorbenzene, dieldrin and its metabolites (HEOD), and individual PCB (polychlorinated biphenyl) congeners. In general, contaminant burdens are now below those at which major biochemical or reproductive effects have been detected in other passerines. Even though infertile eggs sometimes contain elevated concentrations of some PCBs, the congeners found have relatively low toxicity. Moreover, even at apparently contaminated sites, breeding performance and post-fledging survival have been unaffected. Partly as a consequence, White-throated Dippers have been particularly effective in revealing variations in pollutant conditions between geographical regions, and between catchments in different land uses, and even those due to individual point-sources. For example, one tributary of the Welsh River Severn, the Afon Mule, contained not only the highest PCB concentrations ever recorded in dippers, but also a very distinct "signature" of PCB congeners. Subsequent analysis of the river water confirmed a small dismantler's yard as a source of contaminated drainage, although

this same source had never been revealed by routine chemical monitoring.

Researchers in America have now started to use American Dippers as bioindicators and have assessed blood, egg and feather contaminants. Along the Arkansas River, for example, blood from dippers breeding on metal-impacted streams was compared with reference samples and found to have both higher lead concentrations and lower concentrations of ALAD. This enzyme is involved normally in manufacturing a part of the haemoglobin protein, but it may also be strongly bound by lead. Lead concentrations in birds, in turn, reflected concentrations in prey, so that the dippers in this case indicated food-web contamination. In the Chilliwack Watershed, in British Columbia, American Dippers have been used as a means of assessing contamination by both metals and organochlorines. Concentrations of mercury, cadmium and copper in feathers, and of total organochlorines, PCBs and mercury in the eggs of birds resident along the main river were higher than those found in migrants that bred on tributaries but spent the winter on the main river. In other words, contaminant profiles reflected the breeding site far more strongly than the wintering site. Accompanying research, using stable isotopes, revealed that the birds contaminated by most of these compounds were taking a greater proportion of Pacific salmon eggs or fry. In other locations, such contaminants are transported into river systems from the Pacific coastal shelf in migrating salmon, so that American Dippers in these cases have a pivotal indicator role at the interface of terrestrial and marine systems.

Status and Conservation

Four of the five members of the family have relatively large ranges in which they are common on suitable streams. Local declines have occurred as a result of pollution or the degradation of riverine habitats, and this has been recorded even in upland locations and on small streams, often considered the cleanest and the least acidified. None of these species, however, is considered to be under any serious threat on a global level.

The fifth species, on the other hand, is globally endangered. The Rufous-throated Dipper has a relatively small range and a restricted population, confined to south Bolivia and northern Argentina. It was listed as a Red Data species of global concern in 1992, and in the recent *Threatened Birds of the World* it is categorized as Vulnerable because of its small, fragmented range and declining populations. It appears to exist as a large number of subpopulations, none of which is thought to number more than a few hundred individuals, and the combined distributions of which cover about 19,000 km². This cinclid's world population is thought to be in the range of 3000–4000 individuals. There is little evidence for any recent declines in Bolivia, where the species occurs on rivers draining east-facing slopes of two ridges of the Andean foothills in the province of Tarija. On the western of the two ridges, dippers have been found at relatively low densities, of one pair per 1–2 km, on at least four tributaries of the River Guadalquivir and the River Camacho. Possibly up to 200 pairs occur on this ridge. On the better-forested rivers on the eastern ridge, the species is more numerous. Here, dippers have been located in the Tariquía National Reserve, south of Narvaez, on the Escalera, Achirales and Lorayo rivers, and an estimated 250–500 pairs are believed to be present on rivers between Entre Ríos and the Argentine border. Rufous-throated Dippers occur also, less commonly, to the north of Entre Ríos and Narváez, as on the River Villa, where pairs can be found on the upper reaches at intervals of 350–500 m, and more sparsely in the province of Chuquisaca, to the north of Tarija, where the species was first discovered in the mid-1990s.

In north Argentina, Rufous-throated Dippers are known from only a few sites in Jujuy, Catamarca and Tucumán. In Salta, they occur on forested western slopes of Valle de Lerma in the Orán and Baritú areas and near San Lorenzo, where they have been recorded on the River Pulares, the River Blanco and the River Mazano; they have been reported also at higher elevations on a tributary of the Santa Victoria and on the River Sacha Runa. The species is present in Baritú and Calilegua National Parks and in Portrero de Yala Provincial Park, and its total population in the country is thought not to exceed 1000 pairs.

Rufous-throated Dippers are believed to be declining in Argentina, mainly as a result of changes in water management and, possibly, deforestation. Threats include river pollution from mining effluent and nutrient enrichment, siltation of riverbeds fol-



*Given that the usual clutch size of the **American Dipper** is 3–5 eggs, this adult seems to have a slightly below-average brood of three, unless one or two more chicks are lurking invisibly in the shadowy interior. Whatever the total brood size, the nestlings are likely to remain ensconced in the nest for anything between 23 and 28 days, after which they will be spread out at intervals along the riverbank begging from secluded locations. For a cup-nesting species of this size, such a nestling phase would be exceptionally long, but it is more normal for a dome- or cavity-nester.*

[*Cinclus mexicanus unicolor*, near Uray, Colorado, USA. Photo: Jeff Foott/DRK]



*As in other dippers, a recently fledged **American Dipper** is dependent on its parents for between one and two weeks, after which it forages independently. Despite the high level of skill required in diving and swimming after food, young dippers seem very quick in achieving levels of foraging success in line with those of adults. The juvenile in this species is almost uniformly greyish brown, a characteristic that suggests the dipper lineage is far removed from thrushes (Turdidae), wherein a cryptically speckled juvenile plumage is the norm.*

[*Cinclus mexicanus unicolor*, Olympic National Park, Washington, USA. Photo: Rob Curtis/ The Early Birder]

lowing deforestation, and the abstraction of water from upland rivers for the irrigation of tobacco, sugar cane and other crops. The species also faces possible competition with introduced trout (*Salmo*) for invertebrate prey. The construction of dams and hydro-electric schemes are additional threats. Nevertheless, the species does seem still to be reasonably common on some rivers in northern Argentina, where densities of one pair per 400–500 m have been recorded.

Some subspecies of the American and White-throated Dippers have small ranges and could be vulnerable to extinction. In Europe, the status of the White-throated Dipper is considered secure, but only provisionally so, because data from many areas of its range are lacking. G. M. Tucker and M. F. Heath estimated that, in more than half of European countries, information on population sizes was inadequate, and that data on population trends was insufficient in 23% of all countries. The White-throated Dipper has suffered a decline in Hungary, and possible local declines have occurred elsewhere. For example, dippers had apparently disappeared from parts of Ireland, west Wales, south-west and north-east England and parts of Scotland between the periods 1968–1972 and 1988–1991. These areas have acidic streams, many of them draining catchments planted with conifers. On islands, in particular, dippers may have suffered. The race *olympicus* of the White-throated Dipper became extinct on Cyprus soon after 1945. This species bred on the Orkney Islands and the Isle of Man before the 1950s, after which it disappeared, but a slight recovery was evident by the late 1980s. In north-west Russia, the numbers of White-throated Dippers nesting in Karelia have considerably decreased, but the decline there may have happened in the early decades of the twentieth century. There are about 300 pairs nesting in near-polar regions of Finland, where there is, again, a trend of decrease.

The effects on dipper populations of water acidification and pollution have already been discussed (see Relationship with Man). More "traditional" forms of pollution also have an adverse effect on dippers. In the Tiber river system in Italy, and in the Peak District of northern England, for example, White-throated Dippers are more likely to be absent from streams polluted by organic waste and/or suspended solids. In the Italian case, they had disappeared after the quality of water had become degraded. In Britain, many rivers are now recovering from past organic pollution, and dippers have slowly returned to former sites. At the same time, new threats are arising, examples being those presented by climatic change and by agro-chemicals such as the ones used in sheep dips.

Pollution from industrial effluents has caused declines in White-throated Dipper populations in Britain, Poland, eastern Germany and possibly elsewhere across Europe. Dams and hydro-electric schemes remove or alter stretches of river used by these birds, and the modification of rivers by dredging or straightening may have adverse effects by reducing habitat diversity. M. Sara has reported declines in White-throated Dippers in Sicily following river modification, including the concreting of channels. Irrigation and abstraction can reduce flows, while alterations resulting in extreme drought or flooding can also have negative consequences for dippers. Mining operations in the Andes cause both pollution and siltation, and are believed to have adversely affected the White-capped and Rufous-throated Dippers. There is also considerable speculation about the possible effects of climate change, which will change river flow regimes considerably. In many of these instances, the exact effects are poorly quantified and only partially understood, but could possibly be substantial.

Land use in river catchments can affect river systems, for example by influencing erosion and river hydrology. S. Manel and colleagues showed that, across a large extent of the Himalayas, stream habitat structure, chemistry, aquatic-invertebrate abundance and the occurrence of river birds were all affected by land use, after accounting for altitudinal patterns. Streams draining terraced catchments were particularly affected, with adverse consequences for Brown Dippers.

The replacement of old stone bridges with modern concrete box structures capable of supporting heavy traffic has resulted in the loss of many traditional dipper nest-sites, especially in certain areas of the United Kingdom. In these cases, it is a simple matter to install ledges, drainage holes and nestboxes, with benefit to the dippers. Boxes have been used widely in Britain, Hungary, Austria, Germany and elsewhere, in an attempt to halt the decline in dipper populations when old bridges have been destroyed. In south Germany, D. Rockenbauch found that more than a third of White-throated Dipper broods on 420 km of river over a 28-year period were in nestboxes, and A. Kaiser found 64% of nests in boxes in his study area.



*The juvenile plumage of the **Brown Dipper**, in turn, is heavily spotted on upperparts and underparts, drawing comparison with the juvenile phase of certain thrushes, such as the* Sialia *bluebirds. This similarity has been used as evidence of a turdine ancestry, although in other respects, including bodily proportions and nest architecture, dippers seem more like giant semi-aquatic wrens (Troglodytidae). Either way, evidence in favour of a relationship with thrushes or wrens is equivocal, and there is little agreement as to the origins of dippers.*

[*Cinclus pallasii tenuirostris*, Tons River, India. Photo: Otto Pfister]

Perhaps a more surprising and alarming conservation problem, in view of all these potential threats, is that rivers and river birds are often under-represented in many national monitoring schemes. Other surveys cover only a vanishingly small percentage of total river extent or are dependent on small numbers of enthusiasts. In many cases, therefore, changes in dipper populations could go undetected, and the clear value of cinclids as wider environmental indicators may well be wasted.

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*The rarest and least known member of the family is the **Rufous-throated Dipper**, a species of forested mountain streams in south Bolivia and north Argentina. Although it remains locally common, it is absent from several apparently suitable river systems and its overall population size is probably small, given that it occupies a sparse and linear habitat within a highly restricted distribution. These factors give some cause for concern as to its conservation status, and it is therefore listed as Vulnerable. Pollution of relevant rivers should be monitored and controlled, as should deforestation along their length.*

[*Cinclus schulzi*, Tucumán, Argentina. Photo: José & Adriana Calo]



PLATE 34

inches 4

cm 10

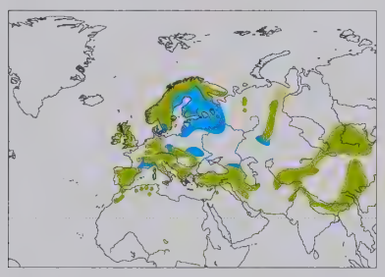
Genus *CINCLUS* Borkhausen, 1797

1. White-throated Dipper

Cinclus cinclus

French: Cincle plongeur **German**: Wasseramsel **Spanish**: Mirlo-acuático Europeo
Other common names: Common/Eurasian Dipper, White-breasted Dipper; White-bellied Dipper (*leucogaster*)

Taxonomy. *Sturnus cinclus* Linnaeus, 1758, Europe = Sweden.
Closest to *C. pallasii*. Subspecific taxonomy in need of revision, especially since data from cytochrome *b* sequences conflict with presumed distributions of races in W Palearctic. Much variation probably clinal. Birds from EC Asia (Altai Mts E to Transbaikalia) sometimes recognized as *baicalensis*. Proposed races *meridionalis* (described from Austrian Alps) and *orientalis* (from Han Abdiposa, in Macedonia) merged with *aquaticus*, and *amphitryon* (from N Turkey) with *caucasicus*. Form described as *sordidus* is a dark morph of *leucogaster*. Cyprus race *olympicus* extinct. Twelve extant subspecies recognized.
Subspecies and Distribution.
C. c. hibernicus Hartert, 1910 – W Scotland (including Inner Hebrides) and Ireland.
C. c. gularis (Latham, 1801) – Scotland (except W), N, C & W England and Wales.
C. c. cinclus (Linnaeus, 1758) – Scandinavia E to NW Russia (E to R Pechora), also C & SW France, NW Iberia, Corsica and Sardinia.
C. c. aquaticus Bechstein, 1796 – C & S Europe (Belgium and E France S to E & S Iberia, Italy, Sicily and Greece).
C. c. uralensis Serebrovski, 1927 – Ural Mts (W Russia).
C. c. minor Tristram, 1870 – NW Africa.
C. c. caucasicus Madarász, 1903 – Turkey, Caucasus, N Iraq and N Iran.
C. c. persicus Witherby, 1906 – SW Iran (Zagros Mts).
C. c. rufiventris Tristram, 1884 – Lebanon and W Syria.
C. c. leucogaster Bonaparte, 1850 – SC Russia (Altai Mts E to Transbaikalia) S to N Afghanistan, NW Pakistan, NW China (Tien Shan, W Kunlun Shan) and Mongolia.
C. c. cashmeriensis Gould, 1860 – N side of W & C Himalayas from N Pakistan E to Sikkim.
C. c. przewalskii Bianchi, 1900 – N Bhutan and C China (S Gansu and NW Sichuan S to SE & E Xizang).



Descriptive notes. 17–20 cm; male 53–76 g and female 46–72 g (nominate), male 60–76 g and female 50–67 g (*gularis*), sexes combined c. 41–65 g (*leucogaster*). Nominate race has head down to ear-coverts and lores dark brown; upperparts darker and greyer with feathers narrowly edged blackish; flight-feathers and tail blackish-brown to grey-brown; chin and throat to breast white, belly to vent blackish-brown; iris brown; bill black; legs dark brown. Sexes similar, female slightly smaller and shorter-winged than male. Juvenile is distinctive, dark slate-grey above, feathers with black-brown margins, wings fringed pale, white chin and throat, dark-barred greyish underparts. Races differ mainly in coloration of underparts, also in tone of upperparts: *hibernicus* is darker than nominate, has narrow rufous band between breast and belly; *gularis* is paler above than previous, with broader chestnut-brown band on lower breast and central belly; *aquaticus* has paler upperparts than preceding races, head and nape grey-brown, some populations with broad bright chestnut band on lower breast and belly; *uralensis* is very similar to last, but upperparts darker; *minor* is also similar, but larger (one of largest races); *caucasicus* is paler, upperparts and belly dull grey-brown, rump and uppertail-coverts grey, some populations with tinge of rufous on lower breast and upper belly; *persicus* is similar to previous, but supposedly larger; *rufiventris* is smaller than last, has darker rufous band below; *leucogaster* is distinctive, all white below except for grey lower flanks, dark vent, also rare dark morph ("*sordidus*") entirely dark brown below, and intermediate forms; *cashmeriensis* has chocolate-brown upperparts and lower belly, paler upper belly, has pale and dark morphs; *przewalskii* resembles last, but belly wholly dark, also has pale and dark morphs. Voice. Male song high-pitched, piercing, loud melodious warbling or trilling, comprises variety of notes in any order, with short phrases repeated as single units, has been likened to that of a thrush (Turdidae) or wren (Troglodytidae); female song less melodious, consisting of scratchy whistles and disconnected units. Call a loud "zzit zzit" or "dzchit dzchit"; rattling calls in greeting and in courtship.
Habitat. Fast-flowing, clear-water rocky streams and rivers with riffles and exposed rocks, and with abundant invertebrate prey; shallow watercourses in broadleaf woodland, in semi-natural forest and on open moorland. Also glacial lakes. Requires rocky cliffs or artificial sites, e.g. bridges, for breeding. Occasionally slower-flowing lowland rivers and seashores in non-breeding season. Mostly in uplands, e.g. in NW Africa commonest on permanent streams of High Atlas at 900–2600 m; breeds 2000–3500 m in Afghanistan and 3000–5500 m in Himalayas; in non-breeding season sometimes lower, down to 2400 m in Himalayas and to c. 1000 m elsewhere in Asia, and locally down to sea-level, especially in Europe. Many present throughout year at high altitudes, so long as some water remains free of ice.
Food and Feeding. Freshwater insects and larvae; more rarely, marine invertebrates in coastal areas. Principal prey mayfly (Ephemeroptera) and stonefly (Plecoptera) nymphs, and larvae of caddis flies (Trichoptera), also dragonfly nymphs (Odonoata) and fly larvae (Diptera), especially blackfly (*Simulium*); shrimps (*Gammarus*) also taken; occasionally small fish, mostly bullheads (Cottidae), some salmon fry (*Salmo*). In study in Britain, Apr–Jun, mayfly nymphs formed 56·7% of diet by number, and caddis-fly larvae 25·3%, stoneflies 7·5%, dipteran larvae 2·8%, beetles (Coleoptera) 2·5%. In 337 stomachs from W Germany, Mar–Aug, caddis-fly larvae present in 92·6%, stoneflies in 21·4%, *Gammarus* in 17·2%, molluscs in 8%, beetles in 7·4%, plant material in 6·5%, fish in 6·2%. Seasonal analyses show predominance of mayflies, stoneflies and caddis flies during breeding season, shrimps, molluscs, beetles and fish becoming more important during winter. Requires up to 79 g of food per day. Diet of young similar to that of adult. Forages on rocks and stones on riverbed, also on wetted surface of rocks above water; sometimes on riverbank among tree roots and leaves; rarely, on coastal shorelines. Feeds mostly by plunging into swift-flowing water; wades in shallow water, but in deeper water generally submerges completely. Swims against current, using wings as main source of locomotion, "walking" on river bottom. In various studies, mean duration of dives 3·2 seconds, range 2·4–7·4 seconds, generally increasing with depth of water, but rarely longer than 10 seconds; exceptionally, up to c. 30 seconds. Maximum rate of dives 11·5 per minute. .
Breeding. Laying Feb–Jun in British Is, mid-Mar to May in NW & C Europe, early May to early Jun in Scandinavia; mid-Mar to May in NW Africa; in Asia, breeds Apr–Jul in N and mid-Feb to Aug in S; 1-2 broods, rarely 3 in S of range. Mostly monogamous, but some males polygynous; solitary nester. Nest built by both sexes, a large globular structure up to 30–45 cm across (often less, c. 20 cm) with side entrance hole, made mainly of moss, lined by female with dry leaves; in rock crevice or cliff ledge, in masonry or on ledge in wall or under bridge, sometimes behind waterfall, rarely in tree, almost invariably over running water, rarely in building away from water; will use nestbox; linear territory of 400–500 m or more, longer (up to 2·5 km) on less favourable watercourses such as acidic streams. Clutch 3–6 eggs, rarely 7, normally 4 or 5; incubation by female, starting with last or penultimate egg, period 15–18 days, rarely to 20 days; chicks brooded by female, fed by both parents, fledge at c. 20–24 days in Britain, 23–27 days in Germany, average 21·5 days in Switzerland; juveniles fed by adults for 1–2 weeks. Of 1986 eggs in 455 nests in Britain, 61·05% hatched and 84·1% of hatchlings reared to 14 days, overall success 51·4%; of 258 eggs laid in 66 clutches in W Germany, 80% fledged, mean 3·91 young per nest.
Movements. Resident, but some post-breeding descent from high altitudes to more lowland rivers, sometimes to coast; more migratory in extreme N, e.g. N Scandinavia. In Europe, some migrate S or SE from Norway and Sweden to Denmark, Finland and SE Baltic region, occasionally to E Britain; some movement S in Ural Mts; male ringed as nestling in Switzerland and female ringed as nestling in C Sweden, both in Jun 1992, both retrapped in Nov of following year in N Poland (where bred together in 1994). Altitudinal movement recorded in NW Africa and Asia, dependent largely on presence or otherwise of ice-free water; many remain at high altitudes even in extremely cold temperatures, so long as running water available; sometimes wanders for long distances. Limited juvenile dispersal, generally over very short distances. Accidental in Faeroe Is and Malta.
Status and Conservation. Not globally threatened. Common and widespread on suitable watercourses. Estimated European population 120,000-300,000 pairs. Densities highest in shallow, fast-flowing streams, thus tend to increase with gradient, altitude and presence of rapids; 1·4–2·2 pairs/10 km in SE Norway, and in C Europe mostly 0·7–10 pairs/10 km; 1·15–2·67 pairs/10 km in Wales, 2·1 pairs/10 km in NW England (Cumbria) and up to 9·7 pairs/10 km in S Scotland (Perthshire); 2·4 pairs/10 km in W Germany and 2·3 pairs/10 km in Austria. Apparently reasonably stable, but periodic fluctuations in small, isolated populations (e.g. on some islands); Cyprus race (*olympicus*) now extinct; formerly bred in lowlands of NW France, and no recent confirmed breeding in lowlands of E Germany; occasional breeding in Netherlands. In NW Africa (race *minor*), probably maximum of 1000 pairs in Morocco (Rif Mts, Atlas Mts); fewer than 100 pairs in Algeria, where known from very few localities (mainly in Hodna and Aurès Mts, in NE). No comparable data from elsewhere in range. Common to locally common in Asia, but scarce to rare on S side of Himalayas; fairly common in China. Throughout range, status and abundance strongly reflect water quality and habitat structure of rivers, and this species is widely recognized as an indicator of environmental quality; pollution that adversely affects aquatic prey also has an impact on dippers. Chemical pollution, as from acidification ("acid rain"), industry, organic effluent, sheep dips and other xenobiotic substances, are potential threats. In parts of Europe (e.g. Wales, Scotland, Scandinavia), shown to suffer severe adverse effects from acidification of rivers, from which recovery likely to be slow (taking decades, even centuries); in Germany and Poland, reported declines more directly attributed to industrial pollution. Poor water quality revealed in impaired breeding, subtle changes in survival, or territory selection; moreover, "pollution" reported cause of death in 3% of recoveries; on other hand, effects on survival of persistent pollutants such as PCBs appear now to be negligible or non-existent. In S Europe and elsewhere, hydro-electric and irrigation schemes may be causing declines by reducing flow rates in watercourses. Habitat degradation, water abstraction and water impoundment are negative factors in parts of range.

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2. Brown Dipper

Cinclus pallasii

French: Cincle de Pallas **German**: Pallaswasseramsel **Spanish**: Mirlo-acuático Pardo
Other common names: Pallas's/Asian/Asiatic Dipper

Taxonomy. *Cinclus Pallasii* Temminck, 1820, "Crimea"; error = eastern Siberia.

On following pages: 3. American Dipper (*Cinclus mexicanus*); 4. White-capped Dipper (*Cinclus leucocephalus*); 5. Rufous-throated Dipper (*Cinclus schulzi*).

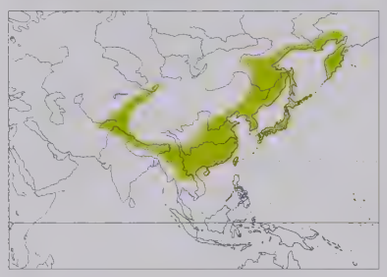
Closest to *C. cinclus*. Proposed races *yesoensis* (described from Hokkaido, in N Japan), *hondoensis* (Hondo, in S Japan) and *marila* (Taiwan) are considered indistinguishable from nominate; similarly, *undina* (from Khasi Hills, in NE India) is merged with *dorjei*. Three subspecies currently recognized.

Subspecies and Distribution.

C. p. pallasii Temminck, 1820 – E Russia, C & E China, Korea, Sakhalin I, S Kuril Is, Japan (S to Yakushima) and Taiwan.

C. p. tenuirostris Bonaparte, 1850 – Tien Shan Mts S to N Afghanistan, and from NW Pakistan (Safed Koh) E in Himalayas to Sikkim.

C. p. dorjei Kinnear, 1937 – E Himalayas E to mountains of W, N & E Myanmar, S China (W Yunnan), NW Thailand, N & C Laos and NW Vietnam.



Descriptive notes. 21–23 cm; two males 88 g and 88·7 g, two females 76·3 g and 86·5 g (nominate), male 68·9–82·6 g and two females 62 g and 79 g (*tenuirostris*), one male 70 g and two females 66 g and 68 g (*dorjei*). Nominate race has plumage entirely dark chocolate-brown, back and chest slightly warmer, more rufous-tinged, than head and rump; flight-feathers and tail dark chocolate-brown; underwing dark grey-brown; iris brown, narrow white eyering; bill blackish; legs blackish-brown. Sexes similar, female somewhat smaller than male. Juvenile is distinctive, dull blackish-brown with conspicuous greyish-white spots on head and throat, greyish-white scalloping on back, breast and belly, contrasting greyish-white edgings on secondaries, tertials and rectrices. Races differ in depth of coloration: *tenuirostris* is paler brown than nominate, juvenile also paler, grey-brown with pale spots above, mottled whitish and brown below; *dorjei* is darker and smaller than previous, also juvenile more rufous than in other races, blackish- brown with pale rufous spots, less prominent pale fringes on wings and tail. Voice. Song a rich warbling, reminiscent of Thrush Nightingale (*Luscinia luscinia*), includes dry buzzing notes, clipped notes, trills and rattles, given in brief verses or in longer, more rambling version; described as somewhat more pleasant than that of *C. cinclus*. Call a buzzing "zzit zzit" or "dzit dzit", less shrill than call of *C. cinclus*, given irregularly or in short series; rattling "r-r-r-r-r" or low rolling "zur-r-r-r" in courtship or as greeting.

Habitat. Fast-flowing rocky mountain streams and shallow rivers with clear water; sometimes at upland tarns. From foothills to above 5000 m locally; breeds from as low as 450 m to c. 4300 m in Himalayas, probably ascending higher after breeding; 450–1800 m in Japan, sometimes lower, even down to sea-level, in non-breeding season. In Himalayas, often on larger, slower rivers and at lower elevations than *C. cinclus*, but much overlap; at W extreme of range, in Uzbekistan, nests of the two species alternated along a length of stream.

Food and Feeding. Aquatic invertebrates, especially mayfly (Ephemeroptera) and stonefly (Plecoptera) nymphs, larvae of caddis flies (Trichoptera) and similar items. Stomachs of birds from Russia found always to contains sand grains and small pebbles. Forages on riverbed, by diving from rock into fast-flowing water. Swims on surface; on calmer pools and tarns, frequently dives from a floating position, with initial slight upward spring as that of small grebe (Podicipedidae), apparently doing so more regularly than does *C. cinclus*.

Breeding. Dec to early Aug, depending on altitude; laying mainly from Apr in Russia, Dec–Mar in China; in Japan, lays from mid-Apr in N (Hokkaido) and from Feb in S (Honshu); often two broods per season. Monogamous; solitary nester. Nest built by both sexes, taking c. 7–10 days, a large globular structure with side entrance, outer wall made largely of moss, inner layer of finer material, small rootlets and leaf ribs, nests in Tien Shan 22·5–28 cm in diameter, walls 3·5–5 cm thick, entrance hole 8–8·5 cm across; sited in rock crevice or cliff ledge, often directly above flowing water, sometimes among mid-river boulders, sometimes in cave, less often behind waterfall or in masonry under bridge; linear territory c. 400–500 m or longer. Clutch 3–6 eggs, most commonly 4 or 5; incubation period 19–20 days and fledging period 23–24 days in E Russia, but respective figures of 15–16 days and c. 21 days reported in Japan. Nests sometimes parasitized by cuckoos (of genus *Cuculus*).

Movements. Resident, with some altitudinal movement. In breeding areas in Gissar Mts (E Uzbekistan–Tajikistan), descends to 1300–1000 m in Oct/Nov, reappearing on nesting territories in Apr or early May; general post-breeding withdrawal from higher levels in Himalayas during winter months, e.g. down to 600 m in Nepal, but many remain at high elevations throughout year. Essentially sedentary in Japan, but some vertical movements in response to temperature; recorded down to sea-level in winter in NE Hokkaido (Shiretoko Peninsula). Possibly some migration in N China. Recorded as vagrant in Hong Kong.

Status and Conservation. Not globally threatened. Considered common and widespread on suitable watercourses throughout most of its extensive range; fairly common in Japan. Reported former occurrence in Bangladesh remains uncertain; no definite records. Recorded in NW Thailand but status uncertain, possibly non-breeding visitor. In Himalayan foothills, water abstraction for irrigation, deforestation, associated agro-chemicals and siltation have local negative impacts; population declines reported in Nepal. Hunted for food in some parts of range, especially China and SE Asia.

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3. American Dipper

Cinclus mexicanus

French: Cincle d'Amérique **Spanish**: Mirlo-acuático Norteamericano
German: Grauwasseramsel
Other common names: Mexican/North American Dipper

Taxonomy. *Cinclus mexicanus* Swainson, 1827, Temascáltepec, Mexico.
Geographical variation rather slight, possibly clinal. Five subspecies recognized.

Subspecies and Distribution.

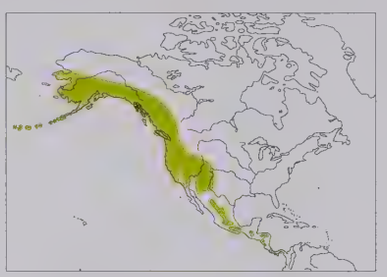
C. m. unicolor Bonaparte, 1827 – Alaska (including Aleutian Is) and W Canada S in W USA to California and New Mexico.

C. m. mexicanus Swainson, 1827 – N & C Mexico (Pacific slope from N Chihuahua S to Michoacán, México and W Puebla).

C. m. dickermani A. R. Phillipps, 1966 – S Mexico on Pacific slope (S Guerrero, S Oaxaca) and Atlantic slope (NE Puebla, C Veracruz).

C. m. anthonyi Griscom, 1930 – SE Mexico (E Chiapas), SW Guatemala, NE & SE Honduras and NW Nicaragua.

C. m. ardesiacus Salvin, 1867 – Costa Rica (entire Caribbean slope, and Pacific slope of Cordillera de Talamanca and Cordillera Central) and W Panama (Pacific slope in Chiriqui and Veraguas).



Descriptive notes. 14–20 cm; male average 60–61 g, female average 53–54·5 g. Nominate race has head and neck dark brown, rest of plumage dark slate-grey, slightly darker on wings and tail; iris brownish, white eyelids; bill dark grey; legs greyish flesh-coloured. Sexes similar, female smaller than male. Juvenile is mostly grey, wing feathers with pale edgings, underparts mottled light rufous, throat usually dark (sometimes whitish). Races vary in colour tone of plumage: *unicolor* has head and neck washed grey-brown, paler than nominate, juvenile with throat mostly white, underparts scalloped or mottled with greyish-white; *dickermani* has crown, lores, chin and upper throat darker than nominate, head side more sooty; *anthonyi* is paler above than previous and nominate; *ardesiacus* is distinctly paler and greyer than other races, head and neck almost concolorous with back, underparts pale ash-grey, juvenile also paler, with white throat and much white on underparts. Voice. Song piercing, often loud, audible at up to 1·5 km in still conditions, a varied and elaborate medley of single and repeated notes and trills, sweet and bell-like but with raspy "jik" call interspersed at intervals, successive note types contrasting with each other, can continue for up to 10 minutes; both sexes sing, songs of each equally varied and complex, essentially identical (no structural differences). Call a loud, harsh, burry "jik", short (mean 46 milliseconds); also lower-frequency "grawk" or "brzzzt", twice as long as "jik" call.

Habitat. Fast-flowing rocky mountain streams and rivers with abundant invertebrate prey. Streams used for breeding rarely larger than 15 m wide and 2 m deep, and have cliffs, large rocks and boulders, especially with overhanging ledges and crevices, for nesting; rocks, fallen trees and debris provide sites for refuge. Outside breeding season, sometimes forages at still waters, such as mountain lakes, tarns and beaver (*Castor canadensis*) ponds. Mostly in uplands, to at least 3500 m in Rocky Mts, but down to near sea-level in N; 1000–3000 m from Mexico S to Nicaragua; 800–2500 m in Costa Rica (and not below 1700 m in on Pacific slope of Cordillera Central), but sometimes down to 600 m after breeding; mainly 1200–2100 m in Panama, but occasionally lower (down to 750 m) in Veraguas.

Food and Feeding. Aquatic insects and larvae, especially mayfly (Ephemeroptera) and stonefly (Plecoptera) nymphs, caddis-fly larvae (Trichoptera), dipteran larvae (particularly those of simuliids); occasionally small fish, tadpoles; salmonid eggs locally important in winter. Prey selected according to relative abundance and size; prefers large prey, of abundant species. Feeds predominantly in water, by walking, swimming and diving. Typically, plunges from a rock or from edge of ice, returning to surface after 5–10 seconds. Feeding bouts of variable duration, up to 60 minutes, usually shorter. Sometimes forages on riverbanks, occasionally picks food from ice or snow; sometimes takes aerial insects by flycatching.

Breeding. Laying from early Mar to Jul, mainly Apr-Jun, in North America, and Feb–May in Costa Rica; sometimes double-brooded. Monogamous, occasionally polygynous; solitary nester. Nest generally built by both sexes, occasionally by female alone, a large globular structure with side entrance, external diameter 20–25 cm, internal 14 cm, entrance hole 7·5 × 5 cm, outer shell made of moss with small amounts of interwoven grass roots and stems and leaves (entirely of leaves and grass if no moss available), inner wall of grass and leaves, sometimes with bark added, lined with leaves; placed in rock crevice or on cliff ledge, in masonry or on ledge in wall or under bridge, sometimes behind waterfall, or in nestbox, almost invariably over running water at height of up to 9 m (mostly 1–3 m), sometimes among mid-stream boulders, occasionally on building near watercourse; often near or on top of old nest, or old nest repaired and reused; linear territory of at least 400 m, average varying from 759 m to 2070 m in different studies. Clutch 2–6 eggs, usually 3–5, average 4·1; incubation by female, period 14–17 days; chicks fed by both parents, mostly by female, fledging period 23–28 days, mostly 24–26 days.

Movements. Resident, with local movements; some altitudinal movement between breeding and non-breeding areas. Winter presence determined by availability of open water; resident at streams that do not freeze in winter. Although freeze-up is ultimate factor determining movement downstream or across drainages, some movement not coincident with freezing occurs. In study in R Chilliwack watershed (SW British Columbia), in Canada, majority of population moved to breeding grounds on higher-lying tributaries in spring; densities on main river 9·8 birds/km in early Nov, compared with 2·1/km in early Jul. In Nov and late Mar 1993/1994, observed in high-level direct flights in late afternoon in Alberta (Canada), suggesting not local movement over longer distances. Some altitudinal movements linked to seasonal food sources provided by winter-run Pacific salmon eggs. Some move considerable distances from breeding areas; record of one individual 1400 km from nearest breeding habitat.

Status and Conservation. Not globally threatened. Common and widespread throughout much of range; uncommon to locally common from Mexico S to Nicaragua; locally common in Costa Rica. Recently discovered breeding on Atlantic slope of Honduras. In United States, densities in Colorado varied from highs of 1·9–4·7 birds/km in Oct to 1–3·9 birds/km of ice-free stream in Feb; in study in Montana, population increased from pre-breeding density of 1 bird/0·77 km of stream to post-breeding density (augmented by juveniles) of 1 bird/0·50 km. In Alaska (Anaktuvak Pass), 6–8 pairs subsist in 7·770 km² of arctic mountains, snowbound for 8 months of year; in winter, restricted to tiny sections of open water a few metres long. Few major threats. This species' habitat, at least in North America, is adequately protected in high mountains, but in coastal mountains forestry-management practices can have adverse consequences. Main potential threats are water pollution and deforestation; clear-cutting, by opening up habitat, may increase temperatures in streams and alter the entire food web. Sometimes killed by fishery-managers and others because of alleged predation on young fish. Nests sometimes destroyed through acts of human vandalism, such events having occurred since 19th century, but this not thought to have any major impact on dipper populations.

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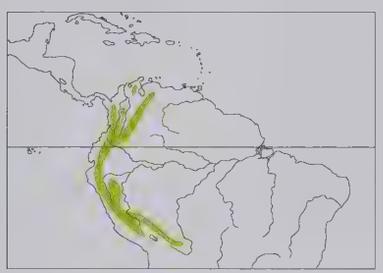
et al. (2005), Mitchell (1968), Morrissey (2004), Morrissey *et al.* (2004a, 2004b, 2005), Morse (1979a, 1979b), Murrish (1970a, 1970b), Obermeyer *et al.* (1999), Osborn (1998, 2000), Peck & James (1998), Phillips (1986), Price, F.E. (1975), Price, F.E. & Bock (1983), Price, J.J. *et al.* (1995), Ridgely & Gwynne (1989), Root (1988), Rowley (1966), Slud (1964), Small (1994), Stiles (1985), Stotz *et al.* (1996), Strom *et al.* (2002), Sullivan (1965, 1973), Thut (1970), Tyler & Ormerod (1994), Udvardy (1963), Whitney & Whitney (1972), Whittle (1921).

4. White-capped Dipper

Cinclus leucocephalus

French: Cincle à tête blanche **Spanish**: Mirlo-acuático Coroniblanco
German: Weißkopf-Wasseramsel
Other common names: White-backed Dipper (*leuconotus*)

Taxonomy. *Cinclus leucocephalus* Tschudi, 1844, Department of Junín, Peru.
Forms a superspecies with *C. schulzi*; sometimes considered conspecific, but differs significantly in plumage coloration and pattern. Three subspecies recognized.
Subspecies and Distribution.
C. l. rivularis Bangs, 1899 – Santa Marta Mts, in N Colombia.
C. l. leuconotus P. L. Sclater, 1858 – Sierra de Perijá, and Andes from W Venezuela (S from Lara) S to Ecuador.
C. l. leucocephalus Tschudi, 1844 – Andes of Peru and NW Bolivia (S to W Santa Cruz).



Descriptive notes. 15–16·5 cm; c. 44 g. Nominate race has whitish crown and nape with fine dark spots and streaks, blackish-brown band from lores back to nape side; upperparts, including wings and tail, blackish-brown; chin and throat to breast white, breast side, belly and flanks blackish-brown; underwing greyish-black, inner webs of secondaries white (visible when wings flicked); iris brown; bill black; legs lead-grey. Sexes similar, female smaller than male. Juvenile has crown more prominently streaked, upperwing-coverts and tertials narrowly edged whitish, throat and breast dark-streaked (throat sometimes mostly grey), belly mottled whitish. Race *rivularis* is paler than nominate, throat spotted grey; *leuconotus* is smaller, distinctive, has white patch on upper back, more extensive white below, only flanks and lower belly to vent dark. Voice. Song a prolonged loud musical trill; flight call a loud sharp "dzeet" or buzzing "zre'e'd", similar to that of congeners.
Habitat. Fast-flowing rocky mountain streams and rivers with boulders, rapids, waterfalls and similar, usually bordered by rocky cliffs or vertical rocky banks; in forested areas and also, at higher elevations, in more open areas. Clear waters preferred. Foothills to lower *páramo* zone, to c. 3900 m, occasionally to 4200 m, mostly above 1000 m; recorded at 1600–3000 m (mainly 2000–2600 m) in Venezuela; from at least 700 m to 3800 m, sometimes down to 400 m, in Ecuador; rarely, down to 100 m in Colombia.
Food and Feeding. Food includes various aquatic invertebrates, notably blackfly larvae (Simuliidae), mayfly nymphs (Ephemeroptera), caddis-fly larvae (Trichoptera); also terrestrial invertebrates, such as earthworms. Forages mainly while standing at edge of water or on mid-stream rock, by pecking for prey; dips bill, and sometimes head, beneath surface. Sometimes wades in water, and occasionally floats or swims on surface; not known to plunge. Also forages in bankside vegetation.
Breeding. Comparatively little information. Nests with eggs found in Feb and Mar in Venezuela; in Colombia, birds in breeding condition in Feb–Sept in N, and fledglings in Oct and juveniles in Dec–Apr in S; nests with eggs/young in Sept in Ecuador; fledglings in Jul in S Peru; eggs in Nov and fledglings in May in Bolivia. Large spherical nest with circular entrance hole, two nests described, one was 25 cm across, diameter of entrance hole 8 cm, outer wall made from moss, inner cup mainly of dry leaves, strips of bark and strips of plastic, built into cleft 1·3 m above water on moss-covered cliff behind waterfall, the other was in narrow niche in cliff face beside waterfall. Clutch 2 eggs; no information on incubation and fledging periods.
Movements. Resident; possibly some altitudinal movement in non-breeding season.
Status and Conservation. Not globally threatened. Fairly common throughout range; widespread, sometimes occurring on even very small rivulets. Normally at densities of less than 1 pair/km to c. 2 pairs/km of stream. Susceptible to pollution; in Ecuador, degradation of water quality has resulted in its disappearance from some streams in Quito area, where only a few birds remain in central valley towards N (e.g. along R Guaillabamba).
Bibliography. Allen (1998), Babin (2002), Baez *et al.* (1997), Bloch *et al.* (1991), Bond (1956a), Carriker (1959), Chapman (1917, 1921), Fjeldså & Krabbe (1990), Georgiev & Gardner (2004), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Koepcke (1970), Lasso (1988), Ortiz & Carrión (1991), Remsen & Traylor (1983), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Schulenberg *et al.* (2001), Skutch (1972), Stotz *et al.* (1996), Tyler & Ormerod (1994), Varty *et al.* (1986), Walker (2001).

5. Rufous-throated Dipper

Cinclus schulzi

French: Cincle à gorge rousse **Spanish**: Mirlo-acuático Gorgirrufo
German: Rostkehl-Wasseramsel
Other common names: Argentine Dipper

Taxonomy. *Cinclus Schulzi* Cabanis, 1882, Cerro Bayo, Tucumán, Argentina.
Specific name sometimes misspelt as *schulzii*. Forms a superspecies with *C. leucocephalus*; sometimes considered conspecific, but differs significantly in plumage coloration and pattern. Monotypic.
Distribution. E Andes in S Bolivia (S Chuquisaca, W Tarija) and NW Argentina (Jujuy, Salta, Catamarca, Tucumán).



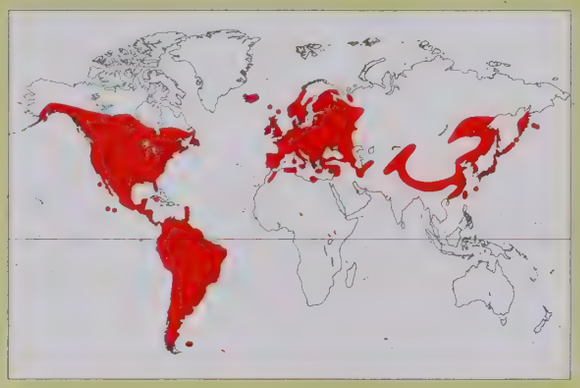
Descriptive notes. 14–15·5 cm; 39·5 g. Plumage is dull dark brownish-grey above, wings and tail slightly darker; white on bases of inner webs of primaries (visible when wing open); chin greyish, throat to uppermost breast contrastingly orange-rufous, rest of underparts grey-brown, greyer on breast, darker on belly; underwing grey, broad white band at bases of primaries; iris dark brown to blackish; bill black to dark grey; legs lead-grey. Sexes similar, female slightly smaller than male. Juvenile resembles adult, but paler, bill more pinkish. Voice. Song a loud melodious warbling or trilling, resembles that of *C. cinclus*; call a loud "zzit" or "dzchit" or "schenk", usually in series, faster when in flight.
Habitat. Fast-flowing rocky mountain streams and rivers, 5–15 m wide, with cascades, waterfalls, and rocky cliffs or banks. Breeds mainly in the Andean alder (*Alnus acuminata*) zone, at 1500–2500 m; reported also at higher levels, and in Bolivia possibly breeds on streams in pastureland at lower elevations (1200 m). In frosty conditions often descends to lower levels, down to c. 800 m, and then sometimes found on larger rivers. Rarely occurs on narrow forest streams (1–2 m wide) favoured by Sharp-tailed Streamcreeper (*Lochmias nematura*).
Food and Feeding. Food aquatic insects and larvae; one stomach contained mostly beetle imagos (Coleoptera). Forages by wading in shallow water or standing on wet rocks and on lips of waterfalls, and picking invertebrates; also probes in wet moss on rocks and in other vegetation on river margin. Occasionally jumps up or makes short flights to take aerial insects. Often feeds with head and most of body immersed, with wings flapping to maintain balance, but, despite some published statements, no definite records of plunging beneath surface. Noted as being more active on overcast days or during light rain; on clear sunny days, remains motionless for long periods in shade beneath rock overhangs. Usually makes only short flights between foraging sites.
Breeding. Nests and eggs Sept–Jan. Monogamous, so far as is known; solitary nester. Large globular nest 24 cm high, 22 cm wide and 14 cm deep, side entrance hole 7 × 5 cm, outer shell made of moss and grass, inner bowl of grass stems, algae, *Alnus* leaves, sometimes few feathers, once paper and plastic, nest cup 8 cm in diameter and 4 cm deep; placed in rock crevice, on cliff ledge, in niche of rocky wall, under overhang in earth bank, on tree roots or in brickwork of bridge, 0·5-1·25 m above rushing water; linear territory of 500–1000 m on suitable stretches of river, sometimes 2 km in less favourable places. Clutch 2 eggs; no information on incubation and fledging periods; nestlings fed by both parents.
Movements. Resident; some altitudinal movement in cold weather.
Status and Conservation. VULNERABLE. Restricted-range species: present in Argentine and South Bolivian Yungas EBA. Uncommon to locally common. Range covers approximately 600 km × 100 km, but many distributional gaps within this; area occupied probably c. 19,000 km². Has small, highly fragmented population estimated at 3000–4000 individuals, and thought to be declining. Bolivian population currently estimated as numbering variously up to 500 pairs to probably over 1000 pairs; Argentine population put at maximum of 1000 pairs. Widespread and not uncommon on rivers on E-facing slopes of two ridges of Andean foothills in S Bolivia; on one of these possibly up to 200 pairs, at low density of 1 pair/1–2 km, on several tributaries of R Guadalquivir and R Camacho; more numerous on better-forested rivers on the other ridge (farther E), where estimated 250–500 pairs on rivers between Entre Ríos and Argentina border; occurs also, less commonly, N of Narváez, as on R Villa into Chuquisaca. In Argentina, recorded in Salta in the Orán and Baritú areas as well as near San Lorenzo, on R Pulares, R Blanco and R Mazano, all on forested W slopes of Valle de Lerma, also reported at higher elevations on a tributary of R Santa Victoria and on R Sacha Runa; known from only a few sites in Jujuy, Catamarca and Tucumán. Main threats arise from changes in river management, water pollution, perhaps also deforestation; quality of rivers adversely affected by mining effluent, nutrient enrichment, siltation, water abstraction for irrigation of crops (tobacco, sugar cane and others), also dam construction and hydroelectric schemes. Logging, grazing and erosion have adverse effects in breeding areas where streams flow through forest. Food competition with introduced trout (*Salmo*) also a potential problem. Impact of these threats most marked in Argentina, and pollution, reduced flows and river-channel modifications most prevalent at lower altitudes. Nevertheless, much of this species' habitat is currently fairly inaccessible, and thus effectively protected. Occurs in Tariquía National Reserve, in Bolivia, and in Baritú, Calilegua and Campo de los Alisos National Parks and Portrero de Yala Provincial Park, in Argentina.
Bibliography. Barnett *et al.* (1998), Canevari *et al.* (1991), Castelino (1985), Chebez (1994), Chebez & Heinonen (1987), Chebez *et al.* (1999), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Collar,Wege & Long (1997), Dinelli (1918), Ergueta & de Morales (1996), Fjeldså & Maijer (1996), Fraga & Narosky (1985), Hellmayr (1934), Hennessey *et al.* (2003), King (1978/79), Mazar Barnett & Pearman (2001), Narosky & Yzurieta (1987), Nores (1987), de la Peña (1989), Remsen & Traylor (1983), Ridgely & Tudor (1989), Salvador (1990), Salvador *et al.* (1986), Schulenberg *et al.* (1997), Stattersfield & Capper (2000), Stotz *et al.* (1996), Tyler, S.J. (1994, 1996, 1997), Tyler, S.J. & Ormerod (1994), Tyler, S.J. & Tyler (1995, 1996), Wege & Long (1995).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family TROGLODYTIDAE (WRENS)



- Small, mostly insectivorous birds with finely pointed and often decurved bill, tail variously long and graduated to extremely short; plumage mostly grey and brown, often with rufous tones.
- 9–22 cm.



- New World, one species also in Eurasia and north Africa.
- Forest, forest edge, scrubland, suburban gardens, marshes, desert brushland, rock faces.
- 17 genera, 85 species, 407 taxa.
- 6 species threatened; none extinct since 1600.

Systematics

Troglodytidae is essentially a New World family, most diverse in Central America and north-western South America, with only one species, the Northern Wren (*Troglodytes troglodytes*), having escaped to the Old World. Everywhere, the members of this family are small, highly active, and highly vocal insectivores, perhaps seldom seen but always, it seems, dominating the soundscape.

The relationships of wrens to other avian groups have been debated over the years. In 1881, R. B. Sharpe, in the *Catalogue of the Birds in the British Museum*, classified the wrens as a subfamily within Timaliidae, which also included the dippers (Cinclidae). A few years later, the American Ornithologists' Union, in its 1889 *Check-list of North American Birds*, included the wrens as one subfamily and the mockingbirds and thrashers (Mimidae) as another within the family Troglodytidae, which it placed just after the wagtails and pipits (Motacillidae) and the dippers, and before the treecreepers (Certhiidae) and the tits and chickadees (Paridae). In 1904, R. Ridgway discussed the long-suspected probability that other songbirds most closely related to the wrens were the treecreepers and the mimids, "not far removed" from the dippers. Ridgway used the relatively high degree of cohesion between the anterior toes to show that the wrens were more like the treecreepers and parids than like the mimids, the latter, which are often referred to as "mimic-thrushes", being in turn more like the true thrushes (Turdidae). E. Mayr and D. Amadon, in 1951, placed the wrens in the family Muscicapidae, which they subdivided into the seven subfamilies Muscicapinae, Timaliinae, Sylviinae, Malurinae, Turdinae, Miminae, and Troglodytinae. They thereby suggested a relationship with, among others, the Old World flycatchers (Muscicapidae), the Old World warblers (Sylviidae) and the Australasian fairywrens (Maluridae). Another group that has often been associated with the wrens is the nuthatches (Sittidae). In a typical linear classification, Troglodytidae has been placed between the dippers and the mockingbirds and thrashers, as by Mayr and Greenway in 1960, or between the treecreepers and the dippers, as by Ridgway in 1904.

In more recent decades, the data obtained by C. G. Sibley and J. E. Ahlquist from studies involving DNA–DNA hybridization suggested a novel hypothesis for the relationships of wrens. Their results indicated that the wrens, including the highly unusual Donacobius (*Donacobius atricapilla*), were the sister-group to the gnatcatchers (*Polioptila*), the gnatwrens (*Microbates*) and the Verdin (*Auriparus flaviceps*). The first two of these groups had traditionally been located within the subfamily Polioptilini of Muscicapidae, while the Verdin had been included with the penduline tits in the family Remizidae. Furthermore, Sibley and Ahlquist suggested that the wrens, the gnatcatchers and the Verdin together formed a sister-group to the treecreepers of the genera *Certhia* and *Salpornis*, and proposed that they all be combined into a single family, Certhiidae. This family, thus expanded, was a sister-group to Sittidae, which comprises the nuthatches (*Sitta*) and the Wallcreeper (*Tichodroma muraria*). In addition, these genetic data emphasized the groups to which the wrens appeared not to be closely related: the babblers, which were moved to the family Sylviidae; the mockingbirds and thrashers, which were found to be a sister-group to the traditional starling family, Sturnidae, placed in another superfamily; and the dippers, forming yet another superfamily.

These recent ideas concerning the relationships of wrens received considerable support from a subsequent genetic analysis undertaken by F. H. Sheldon and F. B. Gill, whose results were published in 1996. It was agreed that the wrens' closest relatives are the gnatcatchers and gnatwrens, the treecreepers and the nuthatches. These authors' data also supported Sibley and Ahlquist's hypothesis that the mockingbirds and thrashers and the starlings, are sister-groups, well separated from the wrens. The Verdin, however, remained with the penduline tits.

Many of these proposed relationships were, in turn, corroborated in 2002 by F. K. Barker and colleagues, and they seem now to be generally accepted. Thus, the sister-group to the wrens is *Polioptila*, and the two together are sister to the treecreepers. Somewhat less certain is that all of these birds are the sister-group to the nuthatches. Further, all of these groups appear together to represent a sister-group to a clade that includes the dippers, the starlings, the mockingbirds and thrashers, the thrushes of the genus *Turdus*, and the Old World *Muscicapa* flycatchers.

Over the last century or so, the family itself has largely been accepted as comprising a cohesive, monophyletic group of species, once several members of the Timaliidae and the Sylviidae were removed. The one remaining problem, however, concerns the Donacobius, a puzzling marsh-nesting bird found throughout most of lowland tropical South America. Details of its anatomy, social structure and behaviour (see General Habits) have suggested that it is either a wren or a mimid, and classifications over the years have alternately placed this species in either Troglodytidae or Mimidae. One of the last public statements, in

1982, declared that the Donacobius is a wren, and not a mimid, a view based on a still unpublished study of pterylosis by M. H. Clench and colleagues. That declaration was accepted by the American Ornithologists' Union in 1983. A year later, the genetic data of Sibley and Ahlquist indicated that the Donacobius was, in fact, as genetically distant from the wrens as it was from the mockingbirds and thrashers, although, somewhat surprisingly, Sibley and Ahlquist used this equivocal information to place the Donacobius among the wrens. More recent genetic analyses by Barker, however, suggest that this species is neither a wren nor a mimid but, rather, a unique "sylvioid", a group that includes the babblers and the Old World warblers, as it clusters close to *Prinia* and *Zosterops*.

For the time being, it is deemed best to retain the Donacobius among the Troglodytidae, pending its "official" transfer to a more appropriate taxonomic position.

Less effort has been expended in trying to determine the relationships among the genera within the wren family. Some debate has centred on the genera *Hylorchilus*, *Catherpes* and *Salpinctes*. In 1904, for example, Ridgway accepted all three genera, but in 1960 Mayr and J. C. Greenway placed the Canyon Wren (*Catherpes mexicanus*) with the American Rock Wren (*Salpinctes obsoletus*) in the genus *Salpinctes*. Sumichrast's Wren (*Hylorchilus sumichrasti*) was originally described in the genus *Catherpes* back in 1871, and then moved to *Hylorchilus* in 1897, although, 90 years thereafter, J. W. Hardy and D. J. Delany argued that, on the basis on vocal similarities, it should be returned to *Catherpes*. A vocally distinct former subspecies of Sumichrast's Wren was elevated to full species status in 1993, becoming Nava's Wren (*Hylorchilus navai*), and thereby providing a small point in favour of keeping these two closely related wrens in their own separate genus, *Hylorchilus*.

A recent survey of the wrens in the genus *Troglodytes*, carried out by N. H. Rice and colleagues, is consistent with some suspected relationships, but it also offers some surprises. Most of all, it encourages further study not only of this genus but also of others within the family, especially the speciose *Thryothorus*. The genetic data obtained by Rice and co-workers indicate, not surprisingly, that the Northern House Wren (*Troglodytes aedon*), the Southern House Wren (*Troglodytes musculus*) and the Brown-throated Wren (*Troglodytes brunneicollis*) represent one major clade and, perhaps less expectedly, that the Rufous-browed Wren (*Troglodytes rufociliatus*) is a sister to this clade; in their analysis, the two house wrens are sister-taxa. An association of the same group of three species had been found in the analysis made just a few years earlier by R. T. Brumfield and A. P. Caparella, but these authors concluded that the Northern House Wren and the Brown-throated Wren were sister-taxa, a disagreement that will have to be settled through further analyses. Another major clade identified by Rice and colleagues included the Mountain (*Troglodytes solstitialis*), Tepui (*Troglodytes rufulus*) and Ochraceous Wrens (*Troglodytes ochraceus*). Surprisingly, the sister-group to these two clades was the Timberline Wren (*Thryorchilus browni*), and the Northern Wren fell well outside this grouping and was considered sufficiently different to be placed alone in a monotypic genus, *Nannus*. These various hypotheses of relationships are intriguing, but they are based on relatively limited genetic sampling, and the true relationships of these species to one another must remain a matter of debate until further study is undertaken.

The only other proposed relationships among wren genera are those implied in various linear classifications, such as the sequence that is used in the present treatment. In such linear sequences, the genera *Troglodytes* and *Thryorchilus*, for example, are placed together, implying that they are closely related, but few data exist to support one linear classification over another.

Further genetic analyses, such as those by Barker, are likely to clarify relationships among the genera. In his thorough study, Barker drew genetic samples from 20 species among the traditional Troglodytidae, and from all genera except the monotypic *Ferminia*, *Thryorchilus* and *Uropsila*, although, as implied in the preceding paragraphs, *Thryorchilus* is assumed to be closely allied to *Troglodytes*. This study also incorporated close relatives of the wrens, such as treecreepers, nuthatches, mimids and a gnatcatcher, as well as several more distantly related species.

Barker's results conflict with the traditional linear series of genera, which had hitherto been the "best guess" of a sequence listed from "primitive" genera to "derived" ones. For example, although traditional linear classifications place *Campylorhynchus* first, and even within its own subfamily, these wrens are clearly not the sister-group to all other wrens, and phylogenetic trees show them nested well within, rather than basal to, the other troglodytids. In addition, such linear series place at the end those genera that tend to be ground-oriented, including *Thryorchilus*, *Henicorhina*, *Microcerculus* and *Cyphorhinus*, but this group is polyphyletic. *Thryorchilus* belongs to a clade that also includes *Cistothorus* and *Troglodytes*, while *Microcerculus* may be part of a basal radiation within the family, and *Henicorhina* and



Throughout its chequered taxonomic career, the ***Donacobius*** *has been shifted back and forth between Mimidae and Troglodytidae. It is mimid-like in size and structure, as well as in its cup-shaped nest and its habit of flaunting itself on prominent perches. Socially and anatomically, however, it is more reminiscent of a wren, an impression bolstered by the hint of barring on its flanks, as well as its duets and mutual displays. DNA results show that the Donacobius is neither mimid nor wren, but an aberrant sylvioid related to Old World babblers and warblers.*

[*Donacobius atricapilla atricapilla*, Miranda, Mato Grosso, Brazil. Photo: Edson Endrigo]





The thirteen species of large wren in the genus Campylorhynchus *are hulking versions of their more delicate counterparts in the temperate zone. They are boisterous and conspicuous birds, frequently declaring their whereabouts with raucous vocalizations, often produced as duets or choruses. Their bills are distinctly bigger than those of most other wrens, allowing them to forage on tougher vegetable matter and well-armoured arthropods. Their legs, too, are unusually hefty and strong. These species tend to be well barred above and uniformly pale below, like this* ***Rufous-naped Wren****, but some species are either heavily spotted or barred on the underparts, or relatively uniform all over, like this race of the* ***Thrush-like Wren****. Interestingly, the two races of this species distributed further north in Amazonia are very different, with much more heavy spotting on the underparts and a weaker supercilium. Spot-breasted and plain-breasted forms approach closely in north Bolivia, without much sign of interbreeding. As these photographs suggest, several* Campylorhynchus *species are especially drawn to palms, in which they often place their nests.*

[Above: *Campylorhynchus rufinucha*, La Ensenada, Guanacaste, Costa Rica. Photo: Michael & Patricia Fogden

Below: *Campylorhynchus turdinus unicolor*, Pantanal, Mato Grosso, Brazil. Photo: Luiz Claudio Marigo]



The genus Cinnycerthia *is restricted to the luxuriant undergrowth of cloudforest and elfin forest in the high Andes. It contains four species, of which the most widespread is the* ***Rufous Wren****. In common with its congeners, its plumage is relatively uniform, and notably fluffy. Like them, it is a fairly skulking bird, which would be infrequently encountered were it not for its loud communal songs. All members of the genus are gregarious, occurring in small parties, sometimes of up to 20 individuals, and it seems likely that they breed co-operatively. Because of their secretive habits and impenetrable habitat, however, most aspects of their ecology and breeding behaviour remain to be described.*

[*Cinnycerthia unirufa unirufa*, Boyacá, Colombia. Photo: John S. Dunning/ VIREO]

Cyphorhinus are sister-taxa, which in turn are probably sister to most *Thryothorus*.

Barker also concluded that *Hylorchilus* and *Catherpes* are sister-taxa, a result consistent with arguments based on similarity of song between the Canyon Wren and Sumichrast's Wren, with the distinct songs of Nava's Wren secondarily derived. It is possible that the sister-group of these wrens is the similarly petrophilous (rock-dwelling) American Rock Wren, which would permit all four of these species to be combined in the same genus, but other data suggest that *Salpinctes*, the rock wren, may be basal to all other wrens.

One of the more controversial of Barker's hypotheses is that the Carolina Wren (*Thryothorus ludovicianus*) is a sister-taxon to Bewick's Wren (*Thryomanes bewickii*), the two being sister-taxa to the *Campylorhynchus* wrens. A discovery that *Thryothorus* is polyphyletic, with, for example, *Thryomanes* nested within it, would not be so surprising in view of the large number of species currently contained in this little-studied genus, but the removal of the Carolina Wren to so distant a location is a rather novel hypothesis.

Clearly, these genetic data provide hypotheses for relationships that are worthy of further testing. Moreover, and above all, it is important to realize that the above-mentioned ideas are largely hypothetical, representing what are currently the best guesses based on limited data. It may be hoped that further research work will significantly clarify these relationships.

Research on vocalizations (see Voice) has suggested that recognition of additional species within the Troglodytidae may be warranted. The Marsh Wren (*Cistothorus palustris*), for example, consists of highly differentiated eastern and western populations in North America, as also does the Northern Wren, the Old World population of which may represent a further one or more species. As revealed by D. E. Kroodsma and co-workers, the Sedge Wren (*Cistothorus platensis*), too, exhibits substantial variation in plumage, vocal behaviour and style of song development, and habitat selection (see Habitat) within its large range, which extends from North America down through South America, and it is almost certain that more than one species is involved.

So far as the Marsh Wren is concerned, not only do the eastern and western populations differ in many perceivable ways, many of these differences being based on genetic details, but they also occur together in the same marshes in central Saskatchewan, where interbreeding between them is limited. Eastern and western males defend territories against one another, and analysis of mitochondrial DNA in the population largely reveals two types of wren, one eastern and one western, with little interbreeding. If they interbred freely, then one would expect a genetically homogeneous population of Marsh Wrens in this transition zone, but the two types of wren signal that they themselves distinguish each other as two species.

Another currently recognized species in which songs provide clues to past evolutionary history is the Northern Wren. In North America alone there are two strikingly different singers, again separated along east-west lines. Eastern and boreal males occur from Nova Scotia south to North Carolina, and west at least to Michigan and Minnesota, while western males have been documented from British Columbia south to California; it is not known where these two types of singer meet, if they do at all. In addition, the songs of Northern Wrens in the Old World are different from those in North America.

On the basis of singing behaviour alone, the emerging hypothesis is that the western Nearctic and eastern Nearctic Northern Wrens diverged first, followed by a divergence of eastern Nearctic wrens and Palearctic wrens. This hypothesis is now supported and enhanced by the work of S. V. Drovetski and co-workers, who analyzed the genomic DNA from 97 wrens from throughout North America and Eurasia. These authors estimate that the western Nearctic wren diverged from the Holarctic ancestor roughly 1·6 million years ago, and that the Holarctic ancestor diverged into eastern Nearctic wrens and Palearctic wrens about one million years ago. Within Eurasia, four more groups are now identified, having originated as follows: eastern and western Palearctic wrens diverged about 0·83 million years ago, and then each respective population diverged one more time, between 0·67 million and 0·54 million years ago. The proliferation of these groups thus occurred during the early and middle Pleistocene glaciations. How many species occur in this Holarctic distribution depends on one's definition of a species, but the best guess is that at least three should be recognized, two in North America and one in Eurasia, and that perhaps each of the four clades in Eurasia could also be recognized as a full species.

Very recently, differences in songs among supposed Grey-breasted Wood-wrens (*Henicorhina leucophrys*) were used in

helping to identify a new species in the western Andes of Colombia. This new species, the Munchique Wood-wren (*Henicorhina negreti*), is found at high elevations on the Pacific slope, in the extremely wet, stunted cloudforest that is almost continuously shrouded in fog. In the taller forest at lower elevations on the west slope, it is replaced abruptly by the Grey-breasted Wood-wren of the subspecies *brunneiceps*, and on the drier east slope by the nominate race of the latter. Compared with the adjacent populations of Grey-breasted Wood-wrens, the Munchique Wood-wren has a more distinctly barred abdomen, a darker juvenile plumage, relatively longer tarsi and a proportionately shorter tail.

It is likely that, were it not for the fact that these wrens learn their songs and therefore have geographically differentiated song dialects (see Voice), far more species of wren would be recognized. New species are rather routinely described for various suboscines, such as the tyrant-flycatchers (Tyrannidae), the songs of which are not learnt and therefore represent a vocal signature for the genotype of the bird; in the case of *Thamnophilus punctatus*, another suboscine that presumably does not learn its songs, M. L. Isler and colleagues have suggested that what was previously considered a single species, the Slaty Antshrike, in fact consists of six or more species. Most species of songbird, however, offer no such obvious vocal clue as to how their populations are differentiated, and the conservative approach is therefore to keep the highly differentiated Northern Wrens in one species. The same reservations apply to the Marsh Wrens and the Sedge Wrens and, no doubt, to other troglodytids, too. Nevertheless, future research will surely lead to the elevation to species rank of a good number of these behaviourally and vocally distinctive taxa. Indeed, very recently published work suggests that the globally threatened Apolinar's Wren (*Cistothorus apolinari*) of Colombia may, in fact, consist of two species, differentiated not only morphologically and by habitat preference but also by song. One form, currently described as the subspecies *hernandezi*, not only has a different song from the nominate race, but additionally, and in contrast to the latter, indulges in communal group song, both antiphonal and in duet.



The genus Cistothorus, *as currently delimited, contains four species. Two of these have enormous ranges encompassing such vocal and morphological variation that they might require subdivision at the species level. All* Cistothorus *wrens are diminutive, dainty birds. Their plumage is dull, usually with strong barring or streaking on the upperparts; their tails are small and habitually cocked. They are adapted to a life in tall reeds, sedges or grasses, and, since this microhabitat tends to lack horizontal perches, they have perfected the knack of clasping adjacent vertical stems with legs akimbo, as this* **Marsh Wren** *demonstrates. In morphology and some aspects of behaviour they resemble sylvioid warblers in the genus* Cisticola, *a genus that occupies similar types of habitat in the Old World.*

[*Cistothorus palustris*, Long Island, New York, USA. Photo: Tom Vezo]

Morphological Aspects

Wrens are generally small birds. In fact, in the New World, only some of the hummingbirds (Trochilidae), kinglets (Regulidae), gnatcatchers and parulid warblers are lighter in weight than the smallest wrens. The largest member of the family, the Giant Wren (*Campylorhynchus chiapensis*) of southern Mexico, is a giant only in comparison with its relatives. With a length of 22 cm and weighing up to 57 g, it is about the size of a smallish thrush. At the opposite extreme, the Sedge Wren is about 9 cm long, and the Northern Wren weighs as little as 6 g. Birds' weights do, of course, vary greatly according to the condition of the individual.

None of the troglodytids is brightly coloured in plumage, and reds, bright yellows, greens and blues are entirely absent in the family. Instead, all wrens are various shades of brown or rufous, often with areas of black and white. Despite this modesty of coloration, some species, particularly in the genus *Thryothorus*, have very attractive patterns of plumage, especially around the head and chest. One feature characteristic of virtually all wrens, and largely absent in most other passerines, is the predominance of barring on both the remiges and the rectrices. This usually takes the form of narrow alternating sections of blackish or dark brown and lighter brown on the outer webs of the primaries and secondaries; the tertials and the rectrices are typically barred on both webs. In a few species, especially the ground-dwelling wrens inhabiting thick, wet, dark tropical forest, the barring is very muted or almost absent, but, on close examination, traces are still discernible, suggesting that the ancestral wrens were barred. The plumage of wrens tends to be soft and rather fluffy.

Most members of the family have twelve rectrices, although the Timberline Wren, the two members of the genus *Hylorchilus* and the enigmatic Zapata Wren (*Ferminia cerverai*) have only ten. The rectrices tend to be rounded, with the outer ones often significantly shorter than the central ones. The tail length differs widely among genera. In the genus *Odontorchilus*, containing two South American species that appear to be converging evolutionarily with the unrelated *Polioptila* gnatcatchers, birds of similar habits and lifestyle, the tail accounts for almost half of the bird's total length. In the cactus wren group, the genus *Campylorhynchus*, it is almost as long in relative terms. More usually, however, the tail is shorter, and in some genera much shorter. The Northern Wren, for example, has a tail that makes up only 25–28% of the total body length. The most extreme instance, however, is that of the ground-dwelling *Microcerculus* wrens, which appear almost tailless in the field, the rectrices being typically no more than one-fifth of the total length of the bird. This is a further example of convergent evolution, in this case with the small *Grallaricula* antpittas in the antbird family (Formicariidae), the habitat and habits of which they share.

All wrens have ten primaries. Although the tenth primary, the outermost, may be much reduced, it is always present. They have relatively short and rounded wings, with usually the middle primaries, P5 to P7, the longest. The primaries of some species, when spread out, seem almost to describe an arc of a circle. The wing shape has clearly evolved for a lifestyle centred around short flights in dense vegetation, rather than for aerodynamic efficiency. Notwithstanding this, some species, notably the Northern Wren and the Northern House Wren, undertake long migratory journeys (see Movements).

There is no sexual dimorphism in wren plumages. Males and females are essentially identical in virtually all cases. In addition, there is frequently little distinction between adults and young. In some members of the genus *Campylorhynchus* and a few of the genus *Thryothorus*, juveniles do differ markedly in plumage from the adults of the species, but in most genera the distinctions between adult and young plumages tend to be minor and subtle.

Although the troglodytid bill tends to be long and often substantially decurved, considerable variation exists within the family, the bill morphology being dependent on lifestyle and food preferences. Some genera, such as *Salpinctes* and *Troglodytes*, have a very fine bill. Members of *Catherpes* and *Hylorchilus*, two genera specializing in foraging on rock faces, have a bill that is especially fine and decurved; they also exhibit several other specific modifications, including a flattened skull, for ob-

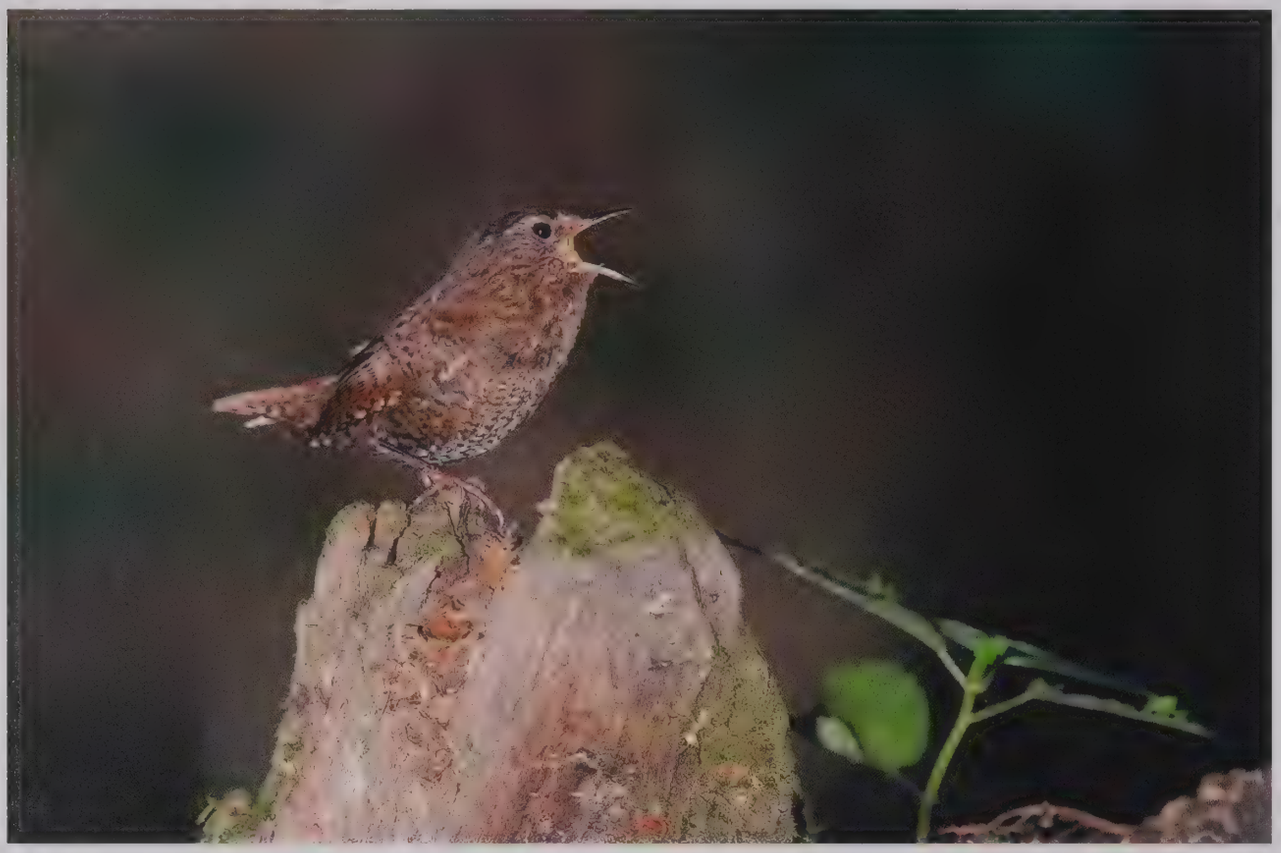




The most diverse genus in the family, Thryothorus, *contains 29 species, all of which are relatively uniform in size and structure. The two forms shown here, the* ***Bay Wren*** *of the northern Andes and southern Central America, and the* ***Riverside Wren*** *of Central America, are classic examples. Their plumage, while not particularly colourful, is nonetheless strikingly patterned, chiefly black, white and chestnut, with patches of strong barring. Like many congeners, these species have well marked faces with distinct moustachial streaks. As with all wrens, sexual dimorphism is very slight or absent. These two forms are sometimes treated as conspecifics, and they share many features, including strong barring on the underparts. Interestingly, the barring in the Bay Wren decreases northwards, such that the race overlapping marginally with the Riverside Wren is virtually plain below. Both species inhabit dense, low vegetation, with the latter species being particularly fond of tangled watercourses, swampy woodland and gulleys, and the former being common in humid second growth and forest edges. Throughout the genus, there is a tendency to occupy dense habitats such as regrowth, watersides, tall scrub, vine tangles or bamboo.*

[Above: *Thryothorus nigricapillus nigricapillus*, El Placer, Esmeraldas, Ecuador. Photo: Doug Wechsler/ VIREO.

Below: *Thryothorus semibadius*, Osa Peninsula, Costa Rica. Photo: Michael & Patricia Fogden]



The most widespread member of the family, and its sole representative in the Old World, is the ***Northern Wren****. It is a common bird of varied habitats, and some of its populations migrate southward to avoid severe weather. Its propensity to disperse across continents, and reach remote islands, has led to the description of 44 races, making it one of the world's most polytypic species. Some races are probably invalid, but others may form cryptic species. Recent DNA analysis supports this latter idea, identifying several distinct clades, and placing these at such a distance from congeners that they may warrant separation in their own genus,* Nannus.

[*Troglodytes troglodytes*, Totori, Japan. Photo: Hirozo Maki]

taining prey from crevices in rocks. The two *Odontorchilus* wrens have a very fine bill with a peculiar little notch, of unknown function, two-thirds of the way down the cutting edge of the upper mandible. In the genus *Campylorhynchus*, several species of which include major quantities of hard vegetable matter as well as large, well-armoured arthropods in the diet, the bill may be quite heavy and powerful. Some members of this genus, such as the Band-backed Wren (*Campylorhynchus zonatus*), appear to specialize in probing for prey in epiphytes and, consequently, have a longer, finer bill.

The most peculiar bills in the family are found in the ground-dwelling genus *Cyphorhinus*. The bill is quite stout and powerful, with a curious upper mandible compressed into a sharp, wedge-shaped ridge along the upper surface, giving an odd "Roman-nose" appearance. The precise function of this character is not known. Another unique feature of this genus, shared with many other, totally unrelated South American suboscine passerines, is a patch of bare, coloured skin around the eye.

Rictal bristles are present in some troglodytid genera, such as *Campylorhynchus*, *Henicorhina* and *Uropsila*. In some cases, as in the three *Cyphorhinus* species and some *Thryothorus* wrens, they may be very short or unobvious, but in many genera, including *Troglodytes*, *Cistothorus*, *Salpinctes*, *Catherpes*, *Hylorchilus* and *Microcerculus*, rictal bristles are obsolete or absent.

As may be expected for a group of birds that spends most of its time in foraging near the ground, the legs and feet of wrens tend to be substantial in proportion to the small size of the birds, and in some cases they are rather heavy and powerful, with large claws. In contrast, the legs and feet of the canopy-dwelling *Odontorchilus* wrens are quite fine and dainty.

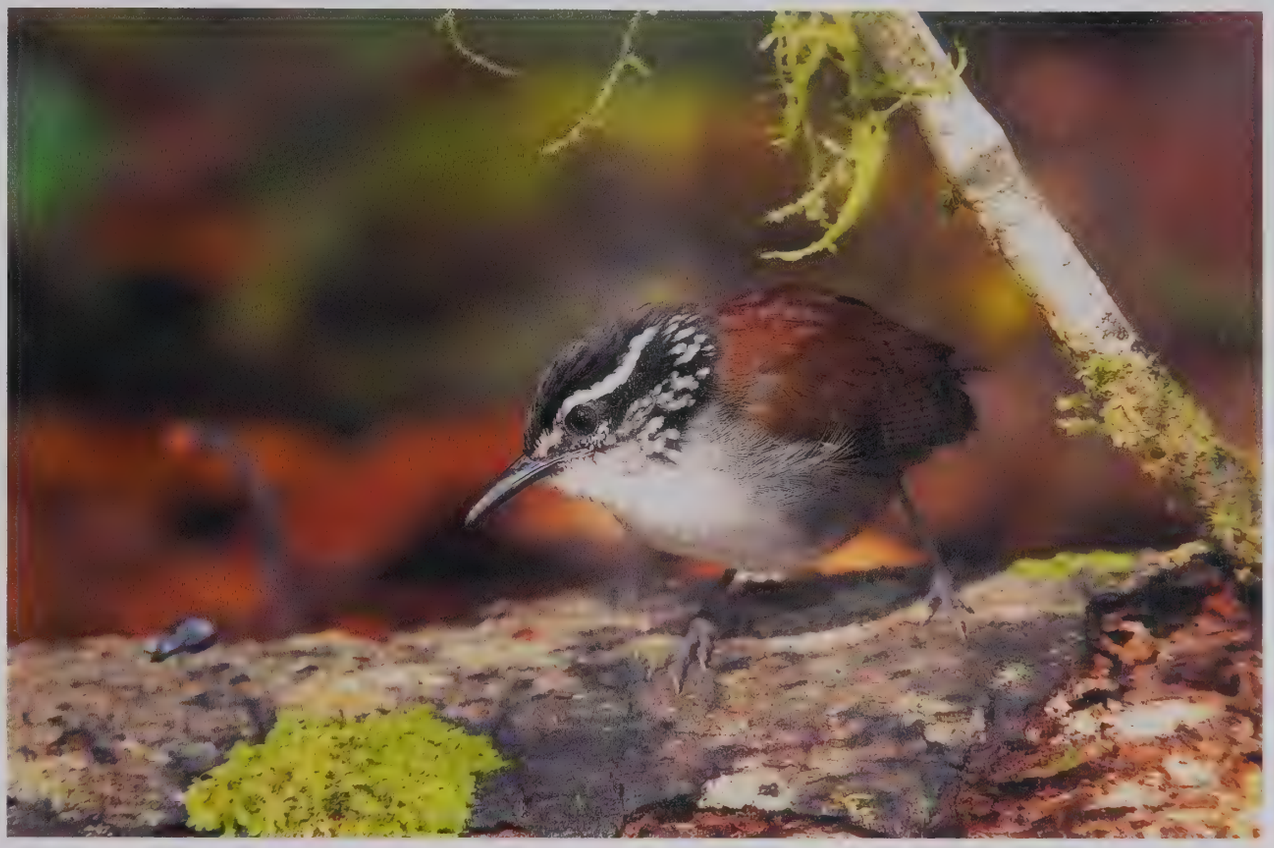
Finally, one species currently included in Troglodytidae, but almost certainly belonging elsewhere (see Systematics), differs in several respects from the "true" wrens. In general external appearance, the Donacobius resembles the mimids more than it does any wren. The wings are powerful and rather rounded, with very short primaries, and the tail is long and very graduated, almost fan-shaped in fact, with the outer rectrices much shorter than the central ones. The legs are long and very robust, and the bill is long and sturdy, with rictal bristles present but not very obvious. A unique feature of the Donacobius is the presence of a patch of bare yellow to orange skin on each side of the neck, not usually visible in the field, but distended during display.

Information on moult sequences is generally lacking for the great majority of wren species, namely those occurring in Central and South America; this would be a very fertile and productive area of study. More data are available for those species found in North America and Europe. Typically, the first moult that a bird undergoes, that in which it renews the original feathers that



The ***Timberline Wren*** *is currently placed in a monotypic genus,* Thryorchilus*, although it seems clear that this is only narrowly differentiated from either* Henicorhina *or* Troglodytes*. It resembles the former in song and nest design, but DNA analysis places it closer to the latter. In terms of plumage it appears to be somewhat intermediate. It is restricted to the highlands of Costa Rica and Panama, where it inhabits the forest-*páramo *ecotone, including stunted bamboo thickets and isolated patches of bushes in sheltered depressions at high altitude.*

[*Thryorchilus browni*, Cerro de la Muerte, Costa Rica. Photo: Marco Saborío]



The genus Henicorhina *comprises a quartet of similar species, all of which have striking head patterns. They are dinky, vibrant, but furtive birds of the humid understorey, difficult to see well, but easily detected by voice. Indeed, the scratchy alarm notes of individuals disturbed low down at roadsides and pathsides, and the loud, distinctive outpourings of duetting pairs, are so often heard in appropriate habitat that wood-wrens seem to be amongst the commonest birds present. Three of the four species inhabit the montane zone, but the* ***White-breasted Wood-wren*** *occurs in lowland evergreen forest, even at sea-level.*

[*Henicorhina leucosticta leucosticta*, Iwokrama, Guyana. Photo: Doug Wechsler/ VIREO]

it grew as a nestling, occurs within a few months of fledging and is incomplete. The body feathers are replaced, but usually only some flight-feathers are renewed. The extent of this moult is variable, not only among species but also among different individuals of a single species. In Bewick's Wren, for example, some individuals replace no tail feathers at all in the first moult and some replace all of them, but about two-thirds of individuals replace only some of the rectrices. The more southerly races of this species tend to renew more feathers than do the northern ones. Among wrens, the replacement of the remiges in this first moult is frequently incomplete and often eccentric; rather than starting at the outermost or innermost primary or secondary and proceeding inwards or outwards in sequence, it begins several feathers in, thereby producing a mixture of old and new feathers in patches. In subsequent years, the prebasic moult of all North American wrens is complete.

Most wrens do not undergo a pre-breeding moult, a spring moult that in some families, such as the parulid warblers, results in a characteristic bright breeding plumage. The exceptions to this are the *Cistothorus* wrens, which have a partial moult before breeding. In the case of the Sedge Wren, this results in the replacement of a variable number of greater wing-coverts, tertials and rectrices, but not, apparently, of the primaries or secondaries. A similar pattern is found in the Marsh Wren.

Habitat

As a family, the wrens have been highly successful in adapting to a very wide range of habitats, occupying a variety of ecological niches which, in continents other than the Americas, are taken up by several different avian families.

The largest wren genus is *Thryothorus*, which has the greatest density of species occurring in southern Central America and north-western South America. Within this one genus there is a considerable diversity of habitat requirements, as may be expected since its members are found all the way from southern Canada south to Bolivia, but, in broad terms, all require areas of trees with substantial undergrowth. Some species, such as the Banded Wren (*Thryothorus pleurostictus*) and the Happy Wren (*Thryothorus felix*), are found in dry forest and bushland. The majority, however, favour more humid habitat, while some, such as the Bay (*Thryothorus nigricapillus*), Riverside (*Thryothorus semibadius*) and Coraya Wrens (*Thryothorus coraya*), show a preference for the vicinities of actual watercourses. *Thryothorus* wrens tend to live more at forest edge than in deep unbroken forest, doubtless owing to the presence of denser undergrowth in areas exposed to sunlight. Consequently, several members of the genus, such as the Plain Wren (*Thryothorus modestus*), have thrived in somewhat disturbed habitat where climax forest has been partially cut over or allowed to regenerate. Sometimes, there is an apparent division of habitat utilization between two species. In Colombia, for example, the Bay Wren tends to occur at forest edge, being replaced in the deeper interior by the Sooty-headed Wren (*Thryothorus spadix*), while in western Mexico a frequently sympatric pair of species, the Happy and Sinaloa Wrens (*Thryothorus sinaloa*), may have slightly different requirements, the latter being able to tolerate sparser woodland. Some species are largely associated with specific vegetation; among these are the Plain-tailed (*Thryothorus euophrys*) and Inca Wrens (*Thryothorus eisenmanni*), which usually occur in areas with *Chusquea* bamboo. Typically, the Plain-tailed Wren is the first colonist of highly disturbed land, such as landslips in the precipitous Andes, a habitat which is mimicked by spoil slopes from road construction. In Bolivia, Moustached Wrens (*Thryothorus genibarbis*) are often found in *Bambusa* bamboo, whereas *Heliconia* thickets in Costa Rica are the preferred habitat of both the Bay Wren and the Black-bellied Wren (*Thryothorus fasciatoventris*). Because of their preference for secondary growth, many species in this genus have survived, or even prospered, with man-made habitat change. The Stripe-breasted Wren (*Thryothorus thoracicus*) in Costa Rica has adapted well to cacao plantations at low altitudes and to shade coffee plantations at higher elevations.

The only temperate-zone *Thryothorus*, the Carolina Wren, which, according to recent studies, may not really belong in this genus (see Systematics), lives largely in highly modified habitats, such as abandoned farmland and well-vegetated suburbs. Its natural habitats included oak (*Quercus*) hardwoods and mixed woodlands of oak and pine (*Pinus*) having a variety of other tree species, such as hickory (*Carya*) and cottonwood (*Populus*). The two insular subspecies of the Carolina Wren,

burleighi and *nesophilus*, are found in slash pine (*Pinus elliottii*) and palmetto stands.

In contrast to *Thryothorus*, the highly terrestrial members of the genus *Microcerculus* are much more restricted to undisturbed virgin lowland humid forest, and do not take at all well to habitat modification. The opening-up of the forest canopy induces lower-level growth unsuitable for these wrens. The four *Microcerculus* species are generally found at lower altitude, usually from sea-level to 1500 m, although the Flutist Wren (*Microcerculus ustulatus*) is a more montane species, being encountered at up to 2100 m on tepui summits in Venezuela.

Four troglodytids are closely associated with rocks. Ironically, the American Rock Wren exhibits the least morphological adaptation to this habitat, not differing greatly, in external form, from members of the genus *Thryothorus*. It occurs in habitats that range from fairly dry to very arid, and is usually to be seen in barren rocky places, including scree slopes, boulder falls and areas of bare, sunbaked mud. It will take advantage of mining and quarrying activities, occurring in areas of spoil and tailings, as well as colonizing areas temporarily made bare by clear-cut forestry. As a vagrant, with records over much of eastern North America, the American Rock Wren is often found in artificial situations which resemble its preferred habitat, such as concrete structures.

The three other rock-dwelling species are truly petrophilous, being associated with rock faces and showing major morphological adaptations to exploit this niche. Canyon Wrens are, indeed, associated exclusively with canyons, rock faces and, in California, sea-cliffs. Given this requirement, this species is quite catholic in its habitat choice, occurring in cool uplands at up to 3000 m, in dry oak-wood canyons or, in southern Mexico, in humid areas as low as 200 m. In contrast, the two members of the genus *Hylorchilus* are very specific in their habitat requirements and, as a consequence, have highly restricted geographical ranges. Both Sumichrast's and Nava's Wrens are found solely in forested karst limestone outcrops. The former can tolerate some slight changes to the forest cover, including the planting of shade coffee, since this does not impinge on the rock faces where it feeds, but for Nava's Wren any disturbance seems to be unacceptable.

Some wrens have radiated into marshland and swamp, exploiting niches that in the Old World are occupied mainly by various genera of the warbler families Cisticolidae and Sylviidae. The four species of *Cistothorus* have all specialized in wet, mostly monocotyledonous habitat of varying types. The Marsh Wren, as a breeding species, is usually confined to vegetation over standing waters, normally cat-tails (*Typha*), bulrushes (*Scirpus*) and reeds (*Phragmites*) in northern freshwater marshes, and cordgrass (*Spartina*) and sedges (*Juncus*) in brackish coastal marshes. Northern interior populations spend the winter in other fresh and brackish marshes, in the latter case frequently co-existing with resident, non-migrating individuals of the species. The Sedge Wren, on the other hand, in North America, usually avoids areas of standing water, preferring damp sedgy meadows, often with small bushes, although it may occur also in weedy rice paddies in the southern USA. In its extensive South American range, however, this wren's habitat varies enormously, from cold *páramo* and *puna* in the Andes to open grassy savanna in Venezuela, dry *cerrado* grassland in Brazil, wet alder (*Alnus*) forest and bamboo bogs in Colombia, the borders of tidal marshes in Argentina and tussac grass (*Parodiochloa flabellata*) in the Falklands. The great diversity of habitat occupancy, along with vocal differences, gives support to the argument for the separation of South American forms taxonomically from those in North and Central America (see Systematics).

The two subspecies of Apolinar's Wren differ markedly in their habitat requirements. The nominate race lives in similar lake-edge habitat to that occupied by the Marsh Wren, namely reedbeds dominated by cat-tails and bulrushes, albeit at altitudes of 2500 m to slightly over 3000 m. In contrast, the race *hernandezi* occurs higher up, between 3800 m and 3900 m, in boggy *páramo* with low shrubs and the hirsute leafy ground plant *Espeletia grandiflora*, known locally as "*frailejón*".

Restricted to a very small area of Cuba, and one possessing a unique habitat, the enigmatic Zapata Wren has very specific habitat requirements. These are savanna-type swamp with sawgrass (*Cladium jamaicense*) and rushes, and with some bushes which can be used as songposts. The water level in the Zapata Swamp is quite variable, but the Zapata Wren tends to live in drier areas, which allow it to forage on the ground.

Another wetland-dwelling species currently included within the family is the Donacobius. This relatively large bird, of uncertain taxonomic affiliation (see Systematics), inhabits brushy veg-



Nightingale-wrens are the most terrestrial members of the family, and they often walk with mincing gait on the forest floor, especially amongst exposed roots or along fallen logs. Their fondness for dark, humid understorey means they tend to disappear from disturbed woodland. Based on consistent differences in voice, the original "Nightingale Wren" has been split into two species. Even so, the ***Southern Nightingale-wren*** *presents a difficult taxonomic puzzle as birds on either side of the Amazon differ vocally and genetically, but not morphologically, whereas birds on either side of the northern Andes differ in plumage but not in voice.*

[*Microcerculus marginatus marginatus*,
Serra dos Carajás,
Pará, Brazil.
Photo: Luiz Claudio Marigo]



The most unusual bills in the family are found in the genus Cyphorhinus. *The culmen is compressed basally to form a narrow ridge with a slightly humped effect. This "Roman nose" is unique amongst wrens, as is the presence of bare skin around the eyes. No function has been satisfactorily proposed for either of these features but they seem likely to relate to a ground-dwelling lifestyle, and possibly a slight inclination to forage at swarms of army ants. The genus contains a trio of species, of which only the* ***Chestnut-breasted Wren*** *shuns the lowlands and lives exclusively in the Andean submontane zone. Here it keeps low in dense undergrowth, and is difficult to see.*

[*Cyphorhinus thoracicus*. Photo: John S. Dunning/ Ardea]

etation along riversides and the overgrown margins of water impoundments in the lowlands of tropical South America. Although it sometimes forages away from such areas, it invariably nests only in marshy vegetation.

In North America, the Northern Wren occurs in such boreal-type habitats as moist coniferous forest with extensive underbrush, but also in mixed hardwood-conifer stands. In addition, it is also found, in an extensive range of subspecies, on treeless or nearly treeless oceanic islands in the Aleutian chain. The same species, having invaded the Old World via the Bering bridge, has, in the absence of competition from other troglodytids, expanded into a catholic range of habitats in three continents. In western Europe, the most favourable habitat is damp woodland, either deciduous or mixed, with extensive undergrowth, but the species is also common in suburban gardens, in moorland scrub and on oceanic islands with scanty vegetation. In other parts of its Old World range it may be more restricted, as, for example, in the Atlas Mountains of Morocco, where it is largely confined to stream valleys and forests at altitudes between 1200 m and 1800 m; in Nepal, it is found at elevations of 2500 m to 4800 m.

In the Americas, the "house wren superspecies" (see Systematics) occupies many of the ecological niches exploited by the Northern Wren in the Palearctic Region, especially highly modified landscapes such as wood edges, well-vegetated suburban areas and regenerating abandoned farmland. The Southern House Wren, being unable to tolerate unbroken forest, does not occur over much of Amazonia, but it rapidly colonizes suitable clearings when they appear. Over the remainder of the continent, this species occupies a remarkable range of habitats, from quite highly urbanized situations to montane areas and arid regions with dry bushland, from sea-level up to 4000 m. In the Falkland Islands, the isolated Cobb's Wren (*Troglodytes cobbi*), obviously closely related to the mainland house wrens, has adapted to a harsh environment consisting of moorland and tussac grass; unlike any other troglodytid species, it has learnt to forage among seaweed on tidal shores, and it does in fact occur at higher densities in places where territories actually abut the sea. In contrast to the house wrens, the group of montane *Troglodytes* wrens occurring from southern Mexico southwards to northern Argentina is much more specific in its habitat requirements. This group, comprising the Mountain, Santa Marta (*Troglodytes monticola*), Ochraceous, Rufous-browed and Tepui Wrens, is usually restricted to various forest types, always in uplands and often at considerable altitude, in the case of the Santa Marta Wren up to 4800 m. Similar habitat, that of bamboo thickets in *páramo* and sub-*páramo*, is required by the appropriately named Timberline Wren.

Bewick's Wren often co-exists with, and perhaps suffers from competition from, the Northern House Wren in eastern North America. Here, it has benefited from European colonization, as semi-open habitat was created by the clearing of climax forest for farmland. In western North America, it occupies a very wide variety of habitats, including *chaparral* brushland, cactus-dominated scrub and riparian woodland, some of which are unsuitable for house wrens.

Forming a group of four closely related species, the wood-wrens are found in forested land from Mexico south to Bolivia. Notwithstanding their great morphological and behavioural similarities, they have developed distinct habitat requirements and only rarely occur together. The White-breasted Wood-wren (*Henicorhina leucosticta*) inhabits wet lowland broadleaf forest, mostly below 1500 m, whereas the Grey-breasted Wood-wren lives in humid mountain forest, usually above 1500 m, and extending up to *páramo* edge at 3800 m in Costa Rica. The Bar-winged Wood-wren (*Henicorhina leucoptera*) is found very specifically in a few high-altitude forests, usually very impoverished, with stunted trees and heavy ericaceous undergrowth, on leached quartzite soil, a habitat which it sometimes shares with the previous species. The fourth species, only recently distinguished as a separate species from the Grey-breasted Wood-wren (see Systematics), is the Munchique Wood-wren, which has hitherto been recorded at 2250–2640 m in extremely wet, stunted cloudforest on the Pacific slope of the Colombian Andes. It is ecologically sharply separated from the two neighbouring subspecies of the Grey-breasted Wood-wren, one of which lives at lower elevations on the same slope, while the other occurs on the drier eastern slopes of the Munchique massif. Although all three taxa can be seen within a distance of 1 km in some areas, no two of them have ever been found together.

The genus *Cyphorhinus* contains three species which, in appearance and habits, seem to be evolving convergently with the terrestrial antbirds, the habitat of which they frequently share.



Bathing in wrens is an obscure subject that receives little attention in literature, but it does seem to occur in species, such as the ***Carolina Wren****, that inhabit relatively humid regions. Desert wrens, by contrast, spend much of their lives without water, and even when it is available they apparently make use of it infrequently. Instead, they are enthusiastic dust-bathers, this habit having been reported in a wide variety of wrens and in a range of moist and arid habitats.*

[*Thryothorus ludovicianus*, High Island, Texas, USA. Photo: Rob Curtis/ The Early Birder]

All occur in wet forest with extensive undergrowth. One, the Chestnut-breasted Wren (*Cyphorhinus thoracicus*), is a montane form, found in wet upland forest and cloudforest, often with a luxuriant growth of mosses and epiphytes. The other two, the Song Wren (*Cyphorhinus phaeocephalus*) and the Musician Wren (*Cyphorhinus aradus*), are lowland species, inhabiting humid forest and second growth with an extensive understorey, or *várzea*, from sea-level to 1000 m.

In the Andes, from Colombia southwards to northern Bolivia, the four species in the genus *Cinnycerthia* are very similar to one another not only in appearance but also in habitat requirements. All are found in wet mountain forest with a luxuriant understorey, usually between 1500 m and 3500 m, and often in association with thickets of *Chusquea* bamboo or in areas with extensive wet mosses growing epiphytically on tree boles and low branches. This genus as a whole does not tolerate extensive habitat modification.

The two *Odontorchilus* species are unusual among wrens in that they feed mostly in the forest canopy. As a consequence, both are restricted to areas of suitable forest, usually those which have not undergone much human modification. The Tooth-billed Wren (*Odontorchilus cinereus*) is a lowland species, found in tropical Amazonian forest below 500 m, while the Grey-mantled Wren (*Odontorchilus branickii*) lives in humid montane upper-tropical and subtropical forest of the Andes from Colombia south to Bolivia. The latter lives at 1400–2200 m on the Amazonian drainage, but can be observed as low down as 800 m on the Pacific slope.

The large wrens in the genus *Campylorhynchus* have succeeded in colonizing some habitats which are denied to smaller members of the family. No other troglodytid genus has been so successful in arid areas of Mexico and the south-western USA, although several other small insectivorous birds from different families, such as the Verdin and the gnatcatchers, have managed to exploit very arid landscapes. The Cactus Wren (*Campylorhynchus brunneicapillus*) occurs in a number of different types of desert, although always with the proviso that there be spiny cacti, such as prickly-pear (*Opuntia*) or various species of cholla (*Opuntia*), in which to nest. In the absence of such cacti, as, for example, in uniform stands of mesquite bushes (*Prosopis*), the Cactus Wren is generally absent. Cactus Wrens adapt quite well, albeit at a lower density, to highly degraded and disturbed habitats, including such areas as gravel pits and junkyards, so long as sufficient suitable vegetation remains for foraging and nesting.

Several other members of the genus, such as the Fasciated (*Campylorhynchus fasciatus*) and Boucard's Wrens (*Campylorhynchus jocosus*), also specialize in semi-arid habitats, although none has been able to exploit true desert to the same degree as has the Cactus Wren. A number of species, such as the Grey-barred Wren (*Campylorhynchus megalopterus*), are found at higher altitudes in Middle America, when their habitats include pine and pine-oak forest. The Rufous-naped Wren (*Campylorhynchus rufinucha*) occurs mostly on the drier Pacific slope, where it is frequently associated with bull's-horn acacias (*Acacia collinsii* and *A. cornigera*). These trees are host to aggressive symbiotic ants of the genus *Pseudomyrmex*, which provide the nesting wrens with vicarious protection from predators such as white-faced capuchin monkeys (*Cebus capucinus*) (see Breeding). In other parts of Middle and South America, species of *Campylorhynchus* have adapted to much more humid forest, where they may specialize in foraging in epiphytes, plant forms that are generally absent in arid areas. Troglodytids occurring in such humid biotopes include the White-headed Wren (*Campylorhynchus albobrunneus*) and the Band-backed Wren, although, in areas where the two are sympatric, the former tends to be found in the wetter habitats. The Band-backed Wren is, in fact, a very adaptable species, occurring in a wider range of habitats than does any other member of the genus; it inhabits humid forest at sea-level in Mexico and Guatemala, palm groves, wet epiphytic and drier pure oak forest at intermediate altitude and, at 3000 m, cypress (*Cupressus*) forest. It can also tolerate substantially disturbed habitat, such as forest clearings and clumps of trees bordering farmland.

General Habits

Among the different groups of wrens there is a considerable diversity of habits. The great majority of the species are found in forest of various types or at forest edges, mostly in tropical areas. These are complex biotopes, with several different ecological niches, the exploitation of which by different troglodytid





Although most wrens are birds of shady nooks, they are not averse to soaking up some sun. This ***Northern Wren*** *has chosen a sunlit tree stump on which to splay its wings and erect the plumage of its upperparts, from nape to rump. The lower photograph shows a* ***Southern House Wren****, similarly prostrated, although in this instance it is sunning itself on level ground. This type of spread-eagled, fluffed-up posture is typical of sunbathing wrens, as well as other passerines, and presumably maximizes the surface area of plumage directly struck by sunlight.*

[Above: *Troglodytes troglodytes troglodytes*, Holstebro, Denmark.

Below: *Troglodytes musculus chilensis*, Patagonia, Chile.

Photos: Hanne & Jens Eriksen]



*This **Banded Wren** is roosting in a low bush, with its body feathers fluffed up and its head tucked into its scapulars for insulation. While this is a common nocturnal posture for wrens, many species prefer to roost inside cavities, or even inside "roosting nests" built specially for this purpose. Cavity roosting is probably commonest in the temperate zone, where wrens maintain body temperatures on frozen winter nights by roosting communally, with scores of individuals sometimes sleeping inside tree holes or nestboxes.*

[*Thryothorus pleurostictus ravus*,
Santa Rosa National Park, Guanacaste, Costa Rica.
Photo: Doug Wechsler/ VIREO]

genera has given rise to quite diverse behavioural patterns. Several groups of wrens keep on or close to the ground. The most highly terrestrial are the *Microcerculus* nightingale-wrens, which spend most of their time on the forest floor, walking with a mincing gait, constantly teetering the tail in the manner of an Ovenbird (*Seiurus aurocapilla*). Nightingale-wrens fly only infrequently, and they are rarely caught in mist-nets, as they simply walk underneath them. In both behaviour and external appearance they are obviously converging evolutionarily with a group of small formicariids, the antpittas, the habitat of which they share. Almost equally terrestrial are the *Cyphorinus* wrens, which forage on or near the forest floor and which, again, share many morphological characteristics with the unrelated terrestrial antbirds.

Wrens enjoy a reputation for furtiveness. Indeed, the majority of species are relatively difficult to observe, as they readily disappear into dense vegetation at the slightest disturbance. The *Microcerculus* wrens have developed this behaviour to a fine art and can be extraordinarily difficult to see for even the most patient watcher. By contrast, the large wrens of the genus *Campylorhynchus* are raucous and boisterous extroverts, frequently singing from exposed posts, in suburban areas even from the tops of lampposts, and generally acting in a rambunctious and uninhibited fashion, travelling in noisy groups that are very easy to locate. In terms of general behaviour, however, most members of the family fall somewhere in between these two extremes. Species such as Sumichrast's Wren can be very secretive, but frequently are overcome by a sense of curiosity that impels them to emerge in order to sneak a look at the intruder. Without their loud and persistent songs, many wren species, especially those inhabiting dense tropical forest, would go largely undetected.

The wrens living in temperate climates tend to be solitary or to occur in pairs, the young associating with their parents for only a limited period of time. Among tropical genera the situation is more variable. The genus *Cinnycerthia* is notably gregarious. The Rufous Wren (*Cinnycerthia unirufa*), for example, occurs in parties of up to 20 individuals, more than can be accounted for by an extended family, and frequently joins mixed flocks with other species. Several other tropical wrens occur in mixed flocks, as typified by the two *Odontorchilus* species, the Tooth-billed and Grey-mantled Wrens, which frequently associate with mixed parties of tanagers (Thraupidae), becards (*Pachyramphus*) and other canopy-dwellers. Similarly, the Stripe-throated Wren (*Thryothorus leucopogon*) routinely occurs in mixed flocks of antwrens (Thamnophilidae) and other species, whereas several of its congeners, such as the Plain-tailed Wren, apparently never do so. Some species routinely follow swarms of army ants (see Food and Feeding). For species with co-operative nesting strategies, notably the tropical members of the genus *Campylorhynchus*, groups of blood-relatives associate and act collaboratively to defend the nest and rear the young (see Breeding).

A few troglodytids, such as the Marsh Wren, will sing at night, especially in moonlight, but generally wrens are strictly



The wrens are perhaps best known and best loved for their songs. Being oscine passerines, they possess a complex syringeal structure and the ability to learn extensive repertoires, and therefore some of them produce vigorous and varied outpourings, while others are hauntingly musical. The least varied and least musical songs in the family, however, are produced by members of the genus Campylorhynchus. *The song of the **Cactus Wren**, for instance, is a harsh, rhythmical series of "jar-jar-jar" notes, a familiar sound in semi-deserts of the southern USA and northern Mexico.*

[*Campylorhynchus brunneicapillus couesi*,
Arizona, USA.
Photo: Tom Vezo]

diurnal. Most members of the family roost in cavities or in nests. Multiple nest-building during the breeding season is common among wrens, in some cases, as in the Marsh Wren, to an extraordinary degree, leaving numerous surplus nests for roosting. Some species, however, build nests for specific use as roosting sites. These include many of the *Campylorhynchus* wrens. Cactus Wrens, for instance, build nests throughout the year, and the juveniles may make tentative efforts at nest-building within days of fledging, with serious construction by ten weeks, obviously long before there is any chance of the youngsters themselves breeding. Wood-wrens, too, construct special roosting nests. In the case of the lowland-dwelling White-breasted Wood-wren, these are quite different from the breeding nest, being of very flimsy construction, and often with little effort at concealment; they are usually placed higher up in forks of slender saplings, so that a predator climbing to the nest cannot avoid shaking the support and alerting the occupant. In contrast, the Grey-breasted Wood-wren, living in the colder highlands, builds a thick-walled, well-insulated and snug roosting nest. White-bellied Wrens (*Uropsila leucogastra*) also build two types of nest, one a flimsy, thin-walled construction that is presumably intended for roosting only.

Many wrens roost as family groups, or the female sleeps with the young. Juveniles may then roost alone, sometimes, as with the Cactus Wren, in nests not of their own construction. Communal roosting also occurs among Northern Wrens. In this case, the birds forage as individuals during the daytime, gathering together only at dusk, the incentive being mutual body-heat conservation during long, cold nights. Northern Wrens frequently roost in cavities, usually with up to ten individuals together, but up to 96 have been found in one site in Europe and 31 in North America. In roosting aggregations of this kind, the wrens position themselves in layers, and the individuals in each layer hold the head pointing inwards, so that a rough circle is formed.

One extraordinary type of behaviour, found among many wrens of different genera and in totally different habitats, is the destruction of the eggs and, sometimes, the young of other birds, sometimes of conspecifics but very frequently those of other species. Both the Giant Wren of southern Mexico and the Bicoloured Wren (*Campylorhynchus griseus*) of northern South America have acquired the local dialectal name of "*chupahuevo*", meaning literally egg-sucker, apparently owing to a propensity of these wrens to enter chicken coops and attack the eggs therein.

Other troglodytids have developed egg destruction to a much greater degree than an occasional raid on a hen-house. In temperate North America, the Northern House Wren can be extremely destructive of other species. House wrens will enter the nests of other cavity-using species, such as the Carolina Chickadee (*Poecile carolinensis*), the Tufted Titmouse (*Baeolophus bicolor*) or the White-breasted Nuthatch (*Sitta carolinensis*), and either pierce the eggs or throw them out. Not all of the wren's aggression, however, is directed at cavity-nesters; species such as the Chipping Sparrow (*Spizella passerina*) may also be victimized, and quail (Odontophoridae) eggs experimentally placed in open nests in Northern House Wren territories may be attacked. The destructive effect of this troglodytid on other avian species has been observed for more than a century, and gave rise to a superbly vitriolic paper by a certain A. Sherman, published in the *Wilson Bulletin* of 1925, entitled "Down with the House Wren boxes". Sherman documented in great detail the crimes of the "felonious House Wren", prophesying that "if no steps are taken to stop his unrestricted breeding it is safe to predict the time will come when all true bird lovers will wring his neck as cheerfully as they now wring the neck of the pestiferous English Sparrow". Her solution was that persons who put up nestboxes used by these wrens should take them down again, so that "a kind Providence need not protect his memory from the just execrations of future generations". In one interesting instance observed by Sherman, a Northern House Wren entered a building where there was a preserved shrike (*Lanius*) nest with blown eggs; the wren pitched the eggs out on to the floor. On being replaced, the eggs were again tossed out by the wren on a second raid, by which time they were a little the worse for wear.

There is circumstantial evidence that nest predation by house wrens may have been heavily implicated in the decline of Bewick's Wren in eastern North America. In most areas, the appearance of the one coincided with the disappearance of the other. Certainly, the Northern House Wren has a substantial impact on the Prothonotary Warbler (*Protonotaria citrea*) in Canada, where this cavity-nesting parulid is considered endangered (see Status and Conservation). In southern Ontario, nest



*Like all of his kind, this male **American Rock Wren** has about a hundred different syllables in his repertoire. Each of his songs consists of one of these syllables repeated three or four times, sometimes with a different syllable appended. During a bout of singing, one series is followed after a short pause by another series, usually based on a different syllable. This cycle is repeated, often for long periods in the breeding season. The resultant pattern and cadence of notes is distinctive, drawing attention to this solitary songster, drably dressed but vociferous, in the sunbaked screes and boulder falls of his desert home.*

[*Salpinctes obsoletus obsoletus*, San Bernardino, California, USA. Photo: Brian E. Small]



*A male **Marsh Wren** perches atop a cat-tail, or bulrush, and gives full vent to his vocabulary, with head held high and cocked tail aquiver. In springtime, in the wetlands of North America, this is a familiar sight, just as the associated hurried gurgling chatter is a common sound. Common it may be, but the codes encrypted into the song of the Marsh Wren are only beginning to be deciphered. One major discovery is that two types of singers exist. From the Great Plains eastward, males have repertoires of roughly 30-60 different songs, whereas, from the Great Plains westward, they sing well over 100 songs apiece. These differences are reflected in song-control centres of the forebrain, western males devoting about 50% more brain space to learning sounds. These same males produce songs full of harsh, grating sounds contrasting with loud tonal notes, while the songs of eastern males are simpler, softer, more liquid. In all, it seems fairly clear that two lineages are involved, and that these are probably worthy of treatment as separate species, a contention supported by assortative breeding in the overlap zone, and the results of DNA analysis. But what factors underlie these differences in repertoire size? One idea is that marshes tend to be smaller in the west, and richer in food, so that wren populations are denser, resulting in decreased territory size and increased polygamy. By boosting male–male competition, and amplifying the effects of sexual selection, marshland ecology may have driven the evolution of large repertoires in western birds.*

[*Cistothorus palustris*, Rocky Mountains, Montana, USA. Photo: John Winnie Jr/DRK]



Another Cistothorus *species, the* ***Sedge Wren****, is equally voluble in defending its territory and advertising for mates. Males in some populations have impressive repertoires of 300-400 songs, which they usually deliver from prominent perches. Preliminary studies suggest that North American birds improvise their dry staccato songs, whereas birds from Central and South America rely more heavily on mimicry and produce more liquid phrases. At the moment, the Brazilian bird pictured here is lumped with relatives as far away as Canada, but further work will probably result in the subdivision of this polytypic taxon into three separate species.*

[*Cistothorus platensis polyglottus*, Serra da Canastra, Minas Gerais, Brazil. Photo: Edson Endrigo]

predation by the wrens is one of the major causes of nesting failure among the warblers.

Although egg predation by Northern House Wrens has attracted the most attention by virtue of the species' close association with humans, other, non-cavity-nesting troglodytids, notably the marsh wrens in the genus *Cistothorus*, are also well known as predators of eggs. In eastern North America, the Marsh Wren frequently attacks the eggs of Red-winged Blackbirds (*Agelaius phoeniceus*), as well as those of species up to the size of the Least Bittern (*Ixobrychus exilis*). Intraspecific egg destruction also occurs; females have been seen to kill the chicks of wrens in adjacent territories and to throw them out of the nests. Marsh Wrens can even be caught in traps baited with small eggs. Furthermore, incubating females of the Marsh Wren may show considerable hostility towards their mates, doubtless in order to protect their own eggs; these are unusually thick-shelled, perhaps as a defence against attack. Marsh Wren predation may have a significant negative effect on the breeding success of Red-winged Blackbirds, which, for their part, are very aggressive towards wrens. In western North America, a similar state of mutual hostility exists between Marsh Wrens and Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*); the blackbirds may destroy wren nests in order to prevent a brooding female from returning to her eggs. In Colombia, Apolinar's Wren appears to have an equivalent mutually hostile relationship with the local icterid, the Yellow-hooded Blackbird (*Chrysomus icterocephalus*).

The Sedge Wren in North America exhibits the same behaviour towards marsh-dwelling icterids and may have a significant adverse effect on their populations. Sedge Wrens have been seen to attack the eggs of species as large as the Cinnamon Teal (*Anas cyanoptera*), but without being able to penetrate the shell. Several other troglodytids, such as the Plain Wren in the genus *Thryothorus*, have been seen to prey on other species' eggs or young, and additional observation and fieldwork would doubtless reveal that this behaviour is quite general.

A number of explanations have been advanced for the phenomenon of egg predation by wrens. In some cases the eggs may be wholly or partially eaten, but frequently they are not; eggs are not, therefore, a significant food source. Intraspecific egg destruction may be a useful way of reducing competition for food resources at the period of maximum demand, and it may be relevant that Marsh Wrens, for example, sometimes nest at very high densities with tiny territories. This explanation, however, is less plausible when applied to interspecific predation involving large unrelated species such as the Yellow-headed Blackbird. In the case of the cavity-nesting house wren, the act of destroying the nests of other cavity-nesting species may, in the long run, ensure a supply of nesting sites for the wrens; the latter, being migratory, arrive and commence nesting later than do some resident victims such as the Carolina Chickadee or the Tufted Titmouse. Perhaps significantly, the non-cavity-nesting Northern Wren appears not to prey on eggs. On the other hand, the highly predatory marsh wrens are also non-cavity-nesters.

The behaviour and general habits of the Donacobius resemble those of the mockingbirds more than they do those of the wrens, a fact that, prior to recent DNA investigations, was used by some authors to argue that this species belongs in the family Mimidae (see Systematics). This is a noisy, extroverted bird, usually occurring in small groups of up to four, blood-related individuals. Pairs perform ritualized mutual displays, with much flirting and wagging of the long tail, which is held such that the conspicuous white tips are on show. A more intense form of display involves the adoption of a hunched-back posture, with the head and tail held down, the throat grossly distended, and sometimes with the wings drooped to reveal the conspicuous white flash on the primaries. Both sexes sing. During mutual song sessions, the pair-members may sit close to one another, waving the long tail rhythmically from side to side, with the inflatable yellow throat patch distended. As the Donacobius seems to form long-term pair-bonds, breeds co-operatively and has a rather extended breeding season, it is somewhat difficult, if not impossible, to distinguish between possible breeding displays and general social activity.

For many troglodytids living in arid conditions, water-bathing is not an option. Indeed, even when water is available, the American Rock Wren and the Canyon Wren have not been observed to indulge in this activity, preferring instead to dust-bathe. Cactus Wrens, too, habitually dust-bathe, but they will bathe in water when it is present, even visiting suburban birdbaths for that purpose. Marsh Wrens, but not Sedge Wrens, have been seen to bathe in swamp water. Curiously, water-bathing has not been reported for Northern House Wrens, although both this species and the

Carolina Wren do dust-bathe. Bewick's Wren bathes in both water and dust. There are a few reports of sun-bathing. Carolina Wrens have been seen to lie in the sun with the eyes half-closed, the wings and tail partially spread, and the feathers of the head, back and rump raised. The Northern Wren and Southern House Wren are others recorded sun-bathing.

Most wren species have been seen to preen, head-scratching being of the indirect type, with the foot lifted over the wing. Allopreening is apparently rare among troglodytids, although it has been observed for a few species.

Aggressive behaviour by wrens is generally associated with territoriality and breeding. Threat displays usually involve the fanning of the wings and the drooping and partial spreading of the tail, while pointing the bill at the object of aggression. Actual physical combat, however, is uncommon. Typically, two individuals will fly vertically upwards for a short distance, while flapping the wings into each other, grasping each other's feet and sometimes pecking. Occasionally, such efforts are directed against other species. American Rock Wrens, for example, have been seen to attack Northern House Wrens which were attempting to pilfer nesting material from their nest, and have also been observed to attack the much larger Western Kingbird (*Tyrannus verticalis*).

Voice

The Troglodytidae include some of the finest and most appreciated singers among all birds. The Northern Wren, for example, heard throughout the Holarctic Region, is appreciated for the long duration of its song and for the degree of expressiveness contained within its singing. This species' songs range from barely audible whispered ones, given while courting a female, to songs delivered with a truly surprising vehemence for so tiny a bird. It is the songs of wrens that define certain habitats throughout much of the New World. Examples are the cascading, sweet liquid whistles of the aptly named Canyon Wren, heard throughout canyons in western North America, the rhythmic "char char char char" of the Cactus Wren in the deserts of the south-west USA and northern Mexico, the unmistakable gurgling of Marsh Wrens, inseparably linked with cat-tail and bulrush marshes from the Pacific seaboard across to the Atlantic coast, the "tea-kettle tea-kettle tea-kettle" song of the Carolina Wren in the Deep South of the USA, and similar striking songs and duets of other *Thryothorus* wrens throughout Central and South America.

Although most wrens bear English names that helpfully allude to their distinctive plumages, or to the habitat or geographical area in which they are found, some have escaped such mundane appellations and have been given names drawing attention more to their vocal abilities. Thus, two of the *Microcerculus* species are known as nightingale-wrens and another as the Flutist Wren, while the Central American subspecies *luscinia* of the Southern Nightingale-wren (*Microcerculus marginatus*) is generally referred to as the Whistling Wren; and two of the three *Cyphorhinus* species are the Song Wren and the Musician Wren. Given the appealing qualities of these songsters, it is no surprise that they have attracted considerable attention, both aesthetically and scientifically.

Most members of the family achieve their remarkable songs by learning, the young birds imitating the songs of adults in the population. This was nicely demonstrated in a study of Bewick's Wrens undertaken by Kroodsma in the north-west USA. In the Willamette Valley of Oregon, where Bewick's Wrens are resident, a young male stays with his parents until four or five weeks of age, and then sets out to find a territory of his own. By eight weeks of age, he will probably already be on his own territory, one that he will retain for the rest of his life. There, the youngster begins to practise singing; his first attempts are only scratchy, continuous jingles, but his efforts gradually improve, and within a few weeks he is already singing what are clearly attempts at imitations of the songs of adult males around him. The young male perfects his songs during the autumn and over the winter, and by the following spring has acquired the songs of his immediate neighbourhood, as those are the ones that he must use in order to function there. Although he was capable of imitating his father's songs before dispersing, all of these were eventually rejected and replaced with the songs that he needed at his permanent breeding location.

This learning process is easily demonstrated also in laboratory experiments, as with Marsh Wrens. If a ten-day-old Marsh Wren is removed from the nest and hears no songs over the next year, he sings "nonsense" songs, songs that are unrecognizable



*For so tiny a bird, the **Northern Wren** produces a remarkable amount of noise! The song of the male, performed in forests and gardens across much of the Northern Hemisphere, is a lusty, ringing series of trills and modulated notes. The sequence lasts several seconds and is almost impossibly complex. That such a vigorous and piercing refrain could issue from a 9-cm bird weighing 6 g has always seemed nothing short of miraculous. A wren in full song cocks and quivers his tail, turns slowly from side to side, and seems to vibrate with single-minded effort. Unlike so many tropical wrens, the female never sings.*

[*Troglodytes troglodytes troglodytes*, Germany. Photo: Gertrud & Helmut Denzau]



*One of the most mesmerizing of avian songs is performed by the **Musician Wren**. It consists of slow, clear, whistled phrases, with halting cadence and innovative switches in pitch, repeated with minor variation before moving on to a novel motif. It is perhaps the most enchanting sound of the Amazonian understorey. Musical sections are often interspersed with brief gurgling churrs, especially when the bird is agitated. The song is sometimes described as an antiphonal duet, but it often seems to be the product of a single bird. How much the female contributes to the main phrase, or to the churring, is a topic for further study.*

[*Cyphorhinus arada interpositus*, Alta Floresta, Mato Grosso, Brazil. Photo: Edson Endrigo]

as to species. If he is allowed to hear some Marsh Wren songs over loudspeakers, however, he attends to the minutest of details in those songs, imitating them with remarkable precision. In the laboratory, males can begin to imitate songs broadcast from loudspeakers when they are as young as 15 days of age, with a peak of learning ability when between 25 and 40 days, and perhaps a secondary peak ending around day 60; little to no learning of additional songs occurs after 75 days. More realistic learning experiences can be achieved by allowing a juvenile to learn songs from an adult, singing male, and the sensitive phase for learning can then be extended well beyond 75 days, to the following spring, at a time when a migratory yearling male would establish his first breeding territory. Flexibility in where and when to learn is necessary for these wrens, as some nestlings hatch in the period after the adults have stopped singing for the year, and those nestlings must delay much of their learning until the following spring.

Most wrens probably learn their songs in this fashion, whereby young birds disperse to a breeding location and learn their songs there. One of the best forms of evidence for this is vocal dialects, in which the songs of the wrens vary over short geographical distances. Songs of Bewick's Wrens, for example, change gradually over distance, and sometimes change abruptly at discontinuities in habitat, so that the songs in a father's neighbourhood are different from those in the neighbourhood where his young male offspring establishes a territory. Songs of Marsh Wrens, and the sequences in which individuals use them, vary from one marsh to another, as J. Verner found in the 1970s. Similarly, Kroodsma recorded that songs of American Rock Wrens at a site in eastern Oregon were different from those uttered by the species at another locality only 160 km away. In Europe, the songs of Northern Wrens can differ over very short distances, a small lake being enough of a barrier that songs on one side are different from those on the other. Likewise, among Carolina Wrens in the USA, it was found that songs changed rapidly over a 145-km transect; most versions were heard at only a single locality, and most songs in the wren repertoires changed abruptly at dispersal barriers.

The one known exception to this process of precise song imitation and the formation of song dialects involves the North American population of the Sedge Wren, which is closely related to, yet so different from, the Marsh Wren. A nestling Sedge Wren, when taken into the laboratory and exposed to songs of adults of its species, imitates none of those songs. Instead of copying songs from the loudspeakers or from other young birds nearby, he improvises a sizeable repertoire of unique songs, such that few, if any, of the songs that he perfects are like those of others of the species. Consistent with this style of song development is the evidence from wild-living individuals in North America, where neighbouring males also have unique repertoires of songs. In ef-

*The antiphonal duet of the **Donacobius**, easily observed in the swamps and lakesides of South America, is impressive both acoustically and visually. The male's song is a rather manic whiplash sound ("who-it, who-it, who-it"), often given solo, but just as often accompanied by the female's rhythmical lower-pitched sizzling. Singing birds fluff their throat plumage, revealing a bizarre patch of bare, inflatable, yellow skin at the sides of the neck, recalling a prairie-chicken* (Tympanuchus). *Even more dramatically, duetting pairs often perch prominently side-by-side, girating their tails in unison.*

[*Donacobius atricapilla atricapilla*, Mamirauá Reserve, Amazonas, Brazil. Photo: Luiz Claudio Marigo]

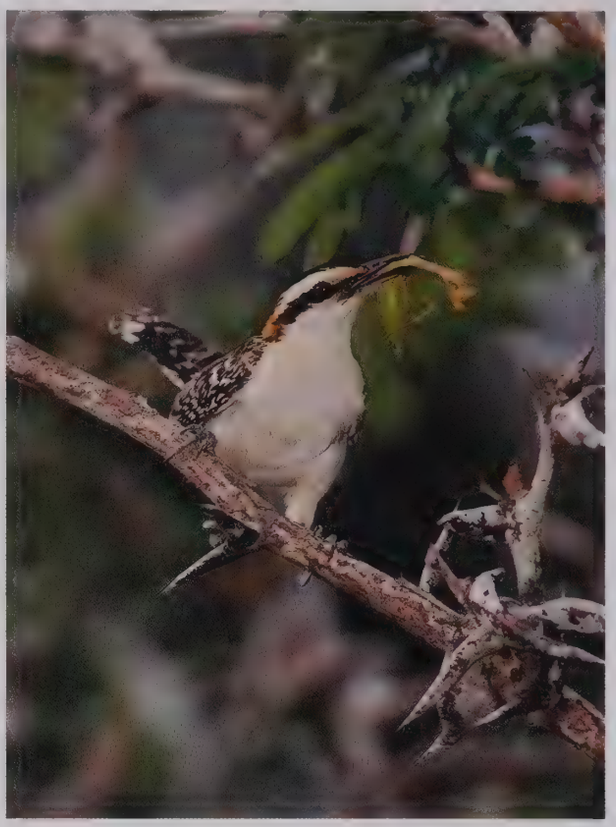


fect, Sedge Wren songs are like snowflakes, as no two seem to be exactly alike, but each is instantly recognizable as being the song of a Sedge Wren because all songs are built on the same principle, a few introductory notes followed by a dry, staccato trill, "cut-cut-cut-trrrrrrrrrrrrr".

Why the North American Sedge Wren seems to differ from all other troglodytids in its style of song development may perhaps be explained by its unique reproductive biology. Individuals that are ringed at one location early in the season, in the northernmost part of the range, typically leave there during mid-season, presumably going elsewhere to breed; as these wrens often arrive to breed at lower latitudes, such as Nebraska, Indiana and Kentucky, during July and August, it appears that they make a stopover to nest on their migratory route back to the coast of the Gulf of Mexico. These Sedge Wrens are rather nomadic, and not at all site-faithful. They rarely return to the same breeding location in successive years; in one unpublished study, S. Johnson found that, of 300 individuals, only one returned to breed at the site where it had nested in the preceding year.

The uniqueness of these North American Sedge Wrens is highlighted by a brief survey of other *Cistothorus* wrens, based largely on the investigations of Kroodsma and colleagues. In Costa Rica and the Falkland Islands, other populations of the Sedge Wren are sedentary, and neighbouring males imitate songs from one another, creating song dialects over relatively short distances. In Brazil, neighbouring male Sedge Wrens answer each other with identical songs, such behaviour being possible only if the birds learn their songs from each other. Similarly, the Merida Wren (*Cistothorus meridae*) of the Venezuelan Andes and the globally threatened Apolinar's Wren of Colombia are sedentary and, again, neighbouring males learn each other's songs, as evidenced by the readily documented song dialects of these species. Interestingly, the recently described subspecies *hernandezi* of Apolinar's Wren not only has a more varied repertoire of song types than the nominate form, but also lives in small groups in which several individuals, of both sexes, sing communally. In North America, too, populations of the Marsh Wren are typically sedentary or, if migratory, individuals are highly site-faithful, returning annually to the same marsh.

It is likely that the unparalleled movement patterns among the North American Sedge Wrens have co-evolved with a reduced emphasis on song imitation. Local communities of birds are highly ephemeral, with individuals staying together just long enough to raise one family. They then move on to the next breeding location, either in the same year or in the following year. There is little time or opportunity to relearn large vocal repertoires at each breeding location; indeed, as the repertoire of a single male can number up to 300 different songs, it is perhaps impossible to accomplish such a feat twice in each breeding season. The solution for these Sedge Wrens is to improvise or in-



Species in the genus Campylorhynchus *have a slightly broader dietary spectrum than that of most wrens: they remain chiefly insectivorous, but without being restricted to smaller invertebrates. This* ***Rufous-naped Wren*** *has caught a large mantid, and others in the genus are known to eat scorpions, or even small vertebrates such as lizards or frogs on occasion. These bulky, co-operative wrens also consume a certain amount of non-animal food, predominantly fruit, berries and seeds, with up to a fifth of the diet made up of this type of vegetable matter.*

[*Campylorhynchus rufinucha*, Santa Rosa National Park, Costa Rica. Photo: Marie Read]



Unlike its larger relatives, the ***Northern House Wren*** *has a tiny bill and its intake of food is almost purely invertebrate. It forages low down in tangled vegetation, where it finds and consumes a range of small bugs, caterpillars, grasshoppers, beetles and spiders. Vegetable matter figures only peripherally, making up less than 2% of the diet. It is also a notorious egg vandal, routinely destroying the clutches of other species, without ever seeming to eat the contents. In the case of cavity-nesters, this curious behaviour might relate to competition for nest-sites, but in other cases it is harder to explain.*

[*Troglodytes aedon*, south-west Ohio, USA. Photo: Dave Maslowski/ Maslowski Productions]



Bewick's Wren *forages mainly on the ground and in low vegetation, thriving on an almost exclusively invertebrate intake. An analysis of stomach contents in Californian birds revealed that 31% of the diet was made up of bugs* (Hemiptera)*, 21% beetles, 17% bees and wasps, 12% caterpillars, butterflies and moths, and the remainder was made up of various other arthropods. A very small quantity of vegetable matter is eaten, mostly in winter.*

[*Thryomanes bewickii*, Rio Grande Valley, Texas, USA. Photo: Tom Vezo]

vent songs, using some shared rules for generating species-typical songs. The result is that, no matter what the geographical origin of each singing individual, and no matter where he has been on his travels, he will instantly be recognized, both by other males and by females, as a Sedge Wren.

Geographical patterns in songs can be the first clues to the evolutionary history of the wrens that sing them. In Costa Rica, for example, F. G. Stiles discovered a sharp transition zone in the songs of nightingale-wrens, leading to the formal recognition of two species, the Northern Nightingale-wren (*Microcerculus philomela*) and the Southern Nightingale-wren. Farther north, in Mexico, the songs of two allopatric *Hylorchilus* populations were found by H. Gómez de Silva to be sufficiently distinct to warrant species status for both, as Sumichrast's Wren and Nava's Wren (see Systematics). In the Neotropics, likewise, careful listening to wood-wrens in Colombia led S. L. Hilty to suggest that the birds living at especially high altitudes represented a new species, as their songs were different from those of the wood-wrens throughout the rest of Colombia. In 2003, this high-elevation form was officially recognized as a new species, the Munchique Wood-wren (see Systematics). The songs of North American Sedge Wrens vary little, if at all, geographically, revealing what must be one large evolutionary unit in North America. In contrast, local dialects conceal these evolutionary groups to some extent in Central and South America, but major geographical differences in songs, from Costa Rica to Brazil and to the Falkland Islands, surely represent different evolutionary groups, which are perhaps, as suggested by M. T. Traylor in 1988, worthy of species status.

Another example in North America is that of the Marsh Wren populations, which almost certainly consist of two species (see Systematics), not one as currently recognized. From the Atlantic coast east to the central Great Plains one style of singer is found, and from the central Great Plains west to the Pacific another kind, and the differences between the two in behaviour are striking. The songs of western males are highly diverse, with harsh and grating sounds contrasting with loud tonal notes; those of eastern males are more liquid, without the harshness, and far less diverse. Western males introduce their songs with short, sharp "click" notes, whereas eastern males begin with a nasal buzz. In addition, western males have much larger song repertoires, containing an average of perhaps 150 different songs, far more than the 30 to 50 songs in the repertoires of eastern males, and western males race through their repertoires much faster than do eastern males. These differences in vocal repertoires are reflected in the song control centres of the forebrain, too, with western males devoting about 50% more brain space to controlling their much larger song repertoires. The extra brain space in western birds is not generated because the birds learn more songs, but, rather, it seems to be part of a

The ***Canyon Wren*** *is an exclusively insectivorous species. Its bill is especially fine and decurved, its cranium is flattened and its tarsi are relatively short. These adaptations allow it to delve deep into crevices in rocks, and even to clamber inside narrow nooks and fissures, techniques it uses to glean spiders, beetles, bugs, ants and termites from their hiding places. It has also been observed to pilfer paralysed invertebrates from the nests of mud-dauber wasps.*

[*Catherpes mexicanus conspersus*, Anza-Borrego Desert State Park, California, USA. Photo: François Gohier/ Ardea]





*The **Plain-tailed Wren** is an Andean species, pairs and small bands of which rove in sprawling patches of* Chusquea *bamboo at high altitudes. So rarely does it show itself for more than a few seconds that almost nothing is known about its foraging ecology. This photograph of a mist-netted individual, temporarily incarcerated in a photographic tent, provides one of the few clues regarding its insectivorous habits.*

[*Thryothorus euophrys euophrys*, Río La Plata, Carchi, Ecuador. Photo: Doug Wechsler/ VIREO]

genetic programme that generates sufficient brain space so that large repertoires can be learned.

Furthermore, many of these behavioural and neural differences are based on genetic differences between eastern and western birds, as nestling males taken from eastern and western populations behave differently when they experience the same laboratory environment. Juveniles from western North America still imitate about three times as many songs as do eastern ones, and the western individuals also allocate more brain space for controlling those larger repertoires. In the laboratory, western males also race through their repertoires faster than do the eastern males. The western males are simply more proficient at learning the larger repertoires than are the eastern birds, and these differences in ability are due to genetic differences that have evolved in the two respective groups since they diverged from their common ancestor. One possible explanation for the escalation in vocal behaviour among western Marsh Wrens is that territories in the west are often smaller, so that competing males are singing more closely together, and males are also more polygynous, so that the stakes in the singing game are higher. With these smaller territories, a small marsh reaches lek-like proportions, and prospecting females can choose from among all of the competing males, a situation that may have promoted the evolution of especially large repertoires and complex singing behaviour.

Just how complex these aspects of vocal behaviour are is revealed by Verner's study of western Marsh Wrens. At Turnbull National Wildlife Refuge, in eastern Washington state, he found that neighbouring males have essentially the same repertoires of about 115 different songs, but they have learnt not only the songs, but also the sequences in which to use them. As the wrens countersing from neighbouring territories, they often answer each other with identical songs, not just once, but many times in succession; there is frequently a community effect, too, as other males within earshot are often heard to echo the same song. The possibilities for interactions are intriguing, as a male can respond to a neighbour with the song that he just sang, or jump ahead one song in the standard sequence, or give a song that is well removed from that particular sequence. The response choice that a male makes, or perhaps is allowed to make, may well signal important information to other individuals listening to this exchange, information that may indicate the relative prowess of the two singers. When a tape recorder plays a standard sequence of song within a territory, for example, a male routinely jumps ahead in the sequence, so that the tape recorder "sings" a particular song type *after* the resident male. It is possible that, by refusing to follow the recorder, the male signals his dominance to this simulated intruder.

As already intimated (see also Systematics), the eastern and western populations of the Marsh Wren almost certainly represent two separate species, and a similar situation prevails with the Northern Wren. The songs of males of the latter species in western North America consist of brief notes delivered at breakneck speed, so that human ears hear little more than a high-pitched blur. In contrast, eastern songs are far less complex; they are delivered more slowly, contain fewer notes, and have fewer notes per unit time. Repertoire sizes, too, differ, eastern males having an average of only two relatively simple songs apiece, whereas western males have perhaps a dozen basic songs, from which countless permutations are generated. Moreover, the non-learnt call notes differ, western Northern Wrens having a sharp, high-pitched note and eastern ones a lower-pitched, richer note. Predictably, perhaps, the songs of this species in the Old World, from Britain east to Japan, are different again. In tonal quality and organization, they are most like those of the wrens from eastern North America. Repertoires in Eurasia consist typically of six or seven songs, each given in a constant, repeatable fashion, much like the singing of eastern Nearctic wrens.

As the esteemed tropical biologist A. F. Skutch pointed out in 2001, we know far more about the few "odd" wrens that have invaded the north-temperate zone than we do about the 50 or so that have remained in the New World tropics. In the tropics, the vocal behaviour of troglodytids can be very different.

One immediately noticeable difference between the wrens in the north-temperate zone and the tropical wrens is that females in the tropics sing far more. In the case of the two house wrens, for example, females in North America sing occasionally in at least one well-studied population, in Wyoming, although perhaps not in some other populations; these Northern House Wrens are polygynous. In contrast, females of the Southern House Wren, which are monogamously paired to their males, sing far more regularly throughout the tropics. Females of the related Socorro





*A study of diet in the **Cactus Wren** showed that 17% of its intake was vegetable matter, a higher proportion than in other members of the family, although few have received detailed study. As it happens, the bulk of this figure was made up of a single item: cactus seeds. In the upper image, a foraging individual is visiting the ripe fruit of a saguaro* (Carnegiea gigantea)*, where, unlike several other vertebrates, it does not seem to target the soft flesh, but merely collects the abundant seeds. By eating this item in considerable quantities, and defecating at least some of them elsewhere, the Cactus Wren is the only troglodytid that can claim a significant role in the dispersal of plants. Cactus seeds are clearly an important food supply in the arid landscapes of the southern USA and northern Mexico, but this does not diminish the fact that 83% of the diet consists of animal matter, including small frogs and lizards, spiders, ants, wasps, grasshoppers, and lepidopterans, as seen in the lower photograph. Some individuals, rather ingeniously, have learnt to prise squashed insects from car radiator grills.*

[*Campylorhynchus brunneicapillus couesi*, Arizona, USA. Above, photo: Dave Maslowski/ Maslowski Productions.

Below, photo: Konrad Wothe]



Although there is virtually nothing on record about wrens drinking, the habit is possibly widespread in the family. As with bathing, it seems likely that wrens living in arid landscapes make less use of water than wrens of relatively humid habitats, even when water is available. Thus, the ***Carolina Wren****, a common bird in moist woodlands of eastern North America from south Canada to north Mexico, is more likely to visit water habitually than are its relatives from drier habitats to the west. How much it drinks, however, is difficult to judge. This individual may be visiting an autumn pool to drink, to bathe or to forage, but the picture tells only part of the story.*

[*Thryothorus ludovicianus ludovicianus*, south-west Ohio, USA. Photo: Dave Maslowski/ Maslowski Productions]

Wren (*Troglodytes sissonii*), confined to the island of that name off western Mexico, also sing. Among the *Cistothorus* wrens, females of the temperate-zone Marsh Wren and Sedge Wren do not sing, but those of the two Andean species do; female Merida Wrens emit a simple trill as their mates sing a more complex, whistled song, and female Apolinar's Wrens utter a prolonged trill that slowly rises and falls in pitch, the male then chiming in with a briefer, more complex song. In southern Mexico, Sumichrast's Wren, in the genus *Hylorchilus*, exhibits similar vocal differences between the sexes: the female's song is less complex than that of the male, being a dry, staccato chatter, much like that of a male Cactus Wren, whereas her mate's song is a rich series of descending whistles.

These differences between temperate and tropical representatives of a genus are especially pronounced among the *Thryothorus* wrens. Only one of these, the Carolina Wren, reaches North America, and the male of that species has a repertoire of 40 or so loud, rich songs; the female, in contrast, utters a simple rattle, typically in response to her mate's song during aggressive encounters with other wren pairs. In the tropics, however, female *Thryothorus* wrens often have songs that are just as complex as are those of the males. The songs of both sexes of the Rufous-and-white Wren (*Thryothorus rufalbus*), for example, consist of a series of pure whistles gradually or abruptly accelerating in tempo, with the female's song slightly higher in frequency than the male's; a male and a female often sing simultaneously, the songs overlapping in time but less so in frequency. In the Black-bellied Wren, too, male and female songs are an equally complex series of rich whistles, often overlapping in time, but that of the the female again perhaps a little higher in frequency. Most impressive among these *Thryothorus* wrens are those species, such as the Buff-breasted Wren (*Thryothorus leucotis*), in which the male and female sing such a tightly co-ordinated duet that their respective roles are indistinguishable, unless one happens to be standing between the two singers.

Careful study of one of these duetting species, the Bay Wren, has revealed how and, to some extent, why the sexes engage in such duets. R. N. Levin found that males and females duet precisely, even when they first meet, thereby dispelling the previously held notion that it would take time, in a long-term monogamous pair-bond, for such precision to be learnt. Rather, it seems that the birds follow some general rules that enable this precision, regardless of which particular song type each contributes. Further, a lone female or a lone male can maintain the territory by itself, dispelling still another idea, namely, that the duet is needed for joint territory defence. It is the female that begins each duet, the male then joining her, and it seems therefore to be the male's behaviour, not that of the female, that makes the joint singing a duet. Perhaps this is because the male can in this way announce to other males in the neighbourhood that this particular female is taken; in other words, he is employing "acoustic mate-guarding".

Equally enlightening is the way in which territorial males and females sing and respond to songs. A paired male responds strongly to both male and female song, as if territorial towards both sexes. When he becomes unpaired, he increases his singing substantially, just as do most unpaired songbird males, and he then responds more strongly to female song than to male song, suggesting that his abundant songs serve to attract a mate. A female that becomes unpaired, however, does not change her singing rate, and lack of a male song accompanying her clearly signals that she is unpaired. Whether she is unpaired or not, she responds strongly to songs of other females but not to those of males, suggesting that she uses her songs in order to defend her territory against other females.

Ongoing studies of another *Thryothorus* species in Costa Rica, by L. E. Molles and S. L. Vehrencamp, illustrate the diverse singing styles within this genus. In the case of the Banded Wren, males are the primary singers, and a typical repertoire consists of about 20 different songs. Females, too, sing, and their songs are of the same general form as those of the males, but of lower amplitude; a female occasionally sings jointly with her mate during a territorial dispute. As with some other troglodytids, such as the Sedge Wren and the Marsh Wren, males sing vigorously at dawn and switch to new song types more at that time than they do later in the morning. Among these wrens, the rate of singing and the frequency with which a male switches to a new song type may signal important information to listeners about his mood, but the exact rules for conveying the appropriate information are not necessarily the same for all species.

What appears to be one of the most complex duets is that of the Canebrake Wren (*Thryothorus zeledoni*), a species restricted



Unlike most Campylorhynchus *wrens, the* ***Cactus Wren*** *is monogamous. Pairs stay together for long periods, with little or no emphasis on courtship display, complex song or duetting. Instead, for much of the year, they breed. Once the female begins to lay in one nest, the male sets out to construct the next. When the first brood fledges, the female completes this second nest and lays a clutch in it. This cycle is repeated until conditions become unfavourable. As a result of their methods, each pair of Cactus Wrens is able to embark on anything from three to six breeding attempts annually, only two or three of which are likely to be successful.*

[*Campylorhynchus brunneicapillus couesi*, Green Valley, Arizona, USA. Photo: Tom Vezo]

to the Caribbean slope of Central America. A study of this wren was recently undertaken in north-east Costa Rica by N. I. Mann and others, who captured and individually colour-ringed 24 territory-holding adults. Blood samples were analysed to enable these to be sexed. The researchers found that the duet of this species consisted of three main components, each one distinctive in structure. The male had a repertoire of very brief rapid phrases and the female had a repertoire of different, slightly longer phrases. In addition, the male had a second, separate repertoire of somewhat longer, higher-frequency phrases, each containing 4–6 elements; each duet was almost invariably introduced by one of these. Thus, a typical duet would consist of the male's introductory phrase followed by a very fast and highly co-ordinated alternation of female and male phrases. In a very few instances, the male's introductory phrase, which he also used as a solo song, was omitted. The Canebrake Wren is often considered conspecific with the Plain Wren, although it differs vocally and in plumage. Interestingly, Mann and colleagues' preliminary data on the nominate race of the Plain Wren, inhabiting the Pacific slope of Costa Rica, appear to suggest that this has a song pattern similar to that of the Canebrake Wren.

Vocalizations include more than singing, of course, and the members of this family have extensive repertoires of calls as well. Partly because wren songs are often so striking, the calls of these species have been studied relatively infrequently. The most thorough study in this respect has been done with the Stripe-backed Wren (*Campylorhynchus nuchalis*), a co-operative breeder (see Breeding) that occurs in Venezuela and Colombia. J. J. Price found that, in co-operative family groups, young males learn their repertoires of calls from adult males, and young females learn their calls from adult females. As a result, males in the same "patriline" have nearly identical call repertoires, no matter whether the young male stays at home or disperses to another group, and all females within a "matriline" have identical repertoires, too, but the calls are different from those of the males. This form of vocal tradition thus provides clues as to both sex and kinship, and studies using playback have shown that the males can readily distinguish male relatives from non-relatives. These wrens provide a rare example of individuals being able to recognize their kin on the basis of learnt vocal cues, and these cues undoubtedly prove useful in helping them to keep track of close kin within and among family groups, thereby enabling complex social relationships among individuals in this co-operative breeder.



Many wrens have short tails which are prominently displayed during song bouts or social interactions. Whether this signal contains any information is unclear, but some evidence has been found in support of the idea that males with the shortest tails are particularly attractive to females. The male ***Marsh Wren*** *is a classically stubby-tailed wren, and proud of it. He is also polygamous. One Canadian study found a skewed sex ratio of only 0·65 males per female, with 10 unmated males, 53 monogamists, 48 bigamists and 9 trigamists. In Georgia, however, only 5% of males had more than one partner, suggesting that rates of polygamy are regionally variable.*

[*Cistothorus palustris palustris*, Dryden Lake, New York, USA. Photo: Marie Read]

Food and Feeding

Arthropods make up the bulk of the food items eaten by most troglodytids. Among the different wren genera, however, there is



Nest-building by males is a recurrent feature in wrens. The ***Carolina Wren*** *is fairly typical in that the bulk of the building process is undertaken by the male, although sometimes he merely brings material and the female adds it to the structure. As with most wrens, the outer layers of the nest are constructed with dead plant matter, usually leaves, strips of dry bark and thin stems. Other, non-vegetable items are sometimes interwoven, including string, horsehair and snakeskins. If the nest is selected for breeding, a soft lining is added.*

[*Thryothorus ludovicianus ludovicianus*, Appledore Island, Maine, USA. Photo: Marie Read]

considerable variation both in the food and in the techniques used as a means of acquiring it.

There is a substantial body of data on the diets of most of the North American wren species, as well as that of the Northern Wren in Europe, derived from examination of stomach contents of specimens. It should be borne in mind, however, that studies of stomach contents were typically undertaken in one geographical location and were often quite limited in scope; hence, published results may not be entirely representative of the diet of a species throughout its range, or even throughout the year. Broadly speaking, invertebrates of many kinds form most or all of the food of this family. For example, American Rock Wrens take such prey as locusts and grasshoppers (Orthoptera), earthworms (Oligochaeta) and grubs, and Canyon Wrens consume spiders (Araneae), beetles (Coleoptera), bugs (Hemiptera), planthoppers (Homoptera), ants (Hymenoptera), termites (Isoptera) and similar prey, ranging in length from 2 mm to 12 mm, while Bewick's Wrens feed on bugs, beetles, bees and wasps (Hymenoptera) and caterpillars. The Northern House Wren eats caterpillars, grasshoppers, beetles, leafhoppers (Cicadellidae) and spiders, among others, and the Northern Wren's diet includes such items as grasshoppers, earwigs (Dermaptera), beetles, spiders, woodlice (Isopoda) and the like. Northern House Wrens are known to favour slower-moving prey, such as spiders and bugs, rather than such insects as flies (Diptera), the capture of which would be more challenging. This species has been seen also to take calcareous matter, such as mollusc shells, and to feed such inorganic items to its young, presumably as a calcium supplement at a time when it is needed for bone growth. Larger, vertebrate prey is occasionally found in stomachs. The American Rock Wren, for example, will take young lizards. It is of interest to note, incidentally, that neither the latter species nor the Canyon Wren appears to drink, even when water is freely available.

Vegetable matter does figure to a minor extent in the diets of some of the smaller North American troglodytids. For instance, Bewick's Wren takes some vegetable matter, especially in winter, while the Northern Wren has been observed to eat berries, including elderberries (*Sambucus*) and blueberries (*Vaccinium*), as well as some seeds and even seaweed.

The large wrens of the genus *Campylorhynchus* have a dietary spectrum that is wider than that of smaller troglodytids. Most members of this genus eat substantial quantities of vegetable matter, such as cactus seeds. The only one which has been studied in any great depth is the Cactus Wren; in one case, 17% of the diet of this species consisted of vegetable matter. *Campylorhynchus* wrens also take relatively large prey, such as lizards and frogs, and one of the Spanish names for Boucard's Wren, "*Matraca Alacranera*", implies that this species eats scorpions (Scorpiones). As previously mentioned (see General Habits), the Giant and Bicoloured Wrens are known in local Mexican and Colombian dialects as "*chupahuevo*", meaning egg-sucker, although whether they actually eat hens' eggs or merely vandalize them is not known. Bicoloured Wrens can also be quite destructive to soft fruit, such as mangoes.



This ***Bicoloured Wren*** *has pulled a strip of bark from a branch for its nest, a domed structure with a narrow side entrance, usually over 3·5 m above the ground. To save the effort involved in building, second-hand nests are readily adopted, as long as they are domed. The nests of* Pitangus *or* Myiozetetes *tyrant-flycatchers are ideal, and the pendant structures built by thornbirds* (Phacellodomus) *are sometimes used. In most populations of this wren co-operative breeding is the norm, and nests with helpers are significantly more successful than unassisted nests.*

[*Campylorhynchus griseus griseus*, Guyana. Photo: Flip de Nooyer/ Foto Natura/FLPA]



Wrens probably build more nests per annum than any other birds. This is not because they nest in greater numbers, or produce exceptional numbers of broods, but because of the phenomenal effort they invest in constructing supplementary nests. Many wrens build simple nests for roosting, and in some the male seems positively addicted to filling every suitable nook in his territory with a half-built potential nest. Multiple nests are a common feature in the ***Marsh Wren****, for example, males of which sometimes build twenty skeleton nests in a season, using dry strips of reeds. As in other wrens, females inspect the handiwork of males and select a single site for breeding, adding finishing touches and a soft lining to the chosen nest. The individual pictured here (almost certainly a female) is collecting cat-tail down for this very purpose. Skeleton nests may take two days to build, and require a considerable investment of energy. Despite the costs involved, the construction of multiple nests might be adaptive on several levels, not least because back-up nests are useful in the event of nest predation or destruction. It is also possible that an assortment of "decoy" nests is enough to confuse or discourage predators, and it has even been suggested that females choose their mates on the basis of nest-building prowess, preferring the most prolific males.*

[*Cistothorus palustris palustris*, Dryden Lake, New York, USA. Photo: Marie Read]





The Campylorhynchus *wrens build bulky globular nests. That of the* ***Rufous-naped Wren*** *is made from grass and plant fibres, with an upward-directed tunnel entrance at one side, leading into a central chamber lined with feathers and down. The whole structure is situated 1·5–10 m above the ground, where it is often highly visible. It is usually placed out of reach in a cactus or thorn bush, or adjacent to an active wasp nest, in order to deter predators. The nest pictured here is lodged in an acacia tree, a site that provides dual protection: if a capuchin monkey* (Cebus) *wants to steal the nest contents it must navigate not only the acacia's vicious thorns, but also, typically, the aggressive ants that live on and in the tree. These ants have painful stings and they rally to attack any mammal careless enough to trespass in their tree. For good reason, then, the Rufous-naped Wren preferentially sites its nests in those trees occupied by the most hostile ants! The* ***Stripe-backed Wren*** *is not known to adopt such clear-cut anti-predator strategies, but often places its similar nests at the tips of narrow branches, where they are difficult for predators to reach. In this case, the outer structure of sticks and bulky twigs is the creation of a thornbird* (Phacellodomus), *illustrating the opportunistic appropriation of abandoned arboreal nests so common in* Campylorhynchus *wrens. When nests of other species are borrowed, the wrens dispense with an outer layer, and simply stuff the existing cavity with a lining, often copiously, as this photograph shows.*

[Above: *Campylorhynchus rufinucha*, Playa Tambor, Costa Rica. Photo: Antonio Cortizo.

Below: *Campylorhynchus nuchalis nuchalis*, Hato El Cedral, Venezuela. Photo: François Gohier/ Ardea]

For many of the Neotropical wren species, the data on prey items are very scanty and, in many cases, few relevant observations are available. Furthermore, the notes on stomach contents accompanying specimens frequently contain unhelpful and vague generalizations, such as "insects", "insect parts" and the like. As a result of the more meticulous work of A. Wetmore in Panama and of F. Haverschmidt in Suriname, the diets of most species in these two countries are known in better detail. According to the rather limited information published, the diet of the tropical *Thryothorus* wrens encompasses a very great variety of arthropods. These comprise many orders of insects, including lepidopteran larvae, ants, bugs, grasshoppers, cockroaches (Blattodea) and dipteran flies, as well as other groups, among them spiders, woodlice, centipedes (Chilopoda) and millipedes (Diplopoda). So far as is known, vegetable matter, usually in the form of seeds, is a very minor component in the food of these species. The sole North American member of this genus, the Carolina Wren, will also take small invertebrates, including lizards, tree-frogs and young snakes.

In its unique sawgrass habitat in western Cuba, the Zapata Wren has learnt to exploit a more varied range of food resources, including fairly large lizards of the genus *Anolis*, seeds, lichen, snail eggs, slugs and a wide variety of invertebrates. By contrast, the marsh-dwelling *Cistothorus* wrens are more purely insectivorous, although in mid-winter, with snow on the ground, the Sedge Wren in extreme southern South America does eat seeds. Snails have not been recorded as being consumed by any troglodytids with the single exception of Sumichrast's Wren, in the diet of which they may figure quite prominently.

The food of the Donacobius consists almost entirely of invertebrates, mostly gleaned from leaf surfaces, but also taken in flight. Recorded prey items of this species include beetles, hymenopterans, orthopterans, neuropterans and arachnoids.

The feeding techniques of wrens also exhibit considerable variation and adaptation to different habitats. The members of many genera spend most of their time in foraging in the lower levels of dense vegetation, where they examine leaves for prey or rummage in leaf litter. *Henicorhina*, *Thryothorus* and *Troglodytes* are typical examples of such unobtrusive wrens. Nevertheless, the various species have differing habits. Some, such as the Coraya Wren, routinely feed quite high up in trees, whereas the Rufous-and-white Wren specializes in foraging in leaf litter and is rarely seen far from the ground. The only wrens which might be described as canopy feeders are the two species in the genus *Odontorchilus*, the Tooth-billed and Grey-mantled Wrens, which are regularly found 30 m or more above the ground in the upper levels of tropical and subtropical forest.

Some tropical species have developed a technique employed by antbirds and many other Neotropical birds, that of following swarms of army ants, opportunistically snapping up invertebrate prey flushed from otherwise secure hiding-places by the insects. Typical in this respect are the terrestrial *Cyphorhinus* wrens, such as the Song and Musician Wrens, which bear a superficial resemblance to some of the formicariid antbirds. Others include the Sooty-headed Wren in the genus *Thryothorus* and, at least where its range overlaps that of army ants, in southern Mexico, the White-bellied Wren in *Uropsila*. The lowland White-breasted Wood-wren is also a typical ant-follower, but its relative, the highland Grey-breasted Wood-wren, is not, as it is altitudinally separated from army ants. Not unexpectedly, the degree of association with army ants varies. Some species, such as the Riverside Wren, will join swarms briefly, before losing interest and foraging elsewhere.

Northern Wrens are somewhat unusual within the family in that they have been seen to prey on tadpoles and tiny fish, by wading into shallow water and actually immersing the head as they search for these food items. They have also been observed while attending the European badger (*Meles meles*), much in the manner of Cattle Egrets (*Bubulcus ibis*) following livestock, and catching prey disturbed by the mammal's foraging activities. The rock-dwelling wrens, the Canyon, Sumichrast's and Nava's Wrens, have developed special anatomical features, such as a long, decurved bill, a flattened skull and widely splayed legs, which enable them to forage deeply into crevices in rock faces. In addition, Canyon Wrens will often sally forth briefly from high rock walls to seize insects flying nearby. Classic flycatching behaviour, involving the mid-air pursuit of flying insects, is uncommon among the members of this family, although Northern Wrens may occasionally practise this method of foraging.

Most terrestrial wrens are very secretive, the two nightingale-wrens obsessively so, feeding only in places where they are well hidden. The Wing-banded Wren (*Microcerculus bambla*) appears to specialize in finding prey in rotten logs lying on the forest floor, where it vanishes for several seconds inside cavities in hollow fallen tree trunks. *Campylorhynchus* species, on the other hand, are anything but furtive. The Cactus Wren, for example, frequently feeds on the ground well in the open, even sometimes on suburban lawns.

Several troglodytids have developed opportunistic feeding strategies. Carolina Wrens, especially during the winter months, come to feeding stations, where they are especially fond of suet. They have also been seen to take sunflower seeds and to crack them open in the manner of a nuthatch, by wedging the seeds into a cranny and hammering them with the bill. Canyon Wrens may pilfer the paralysed spiders with which mud-dauber wasps (*Scelifron cementarium*) provision their nests, while the White-bellied Wren will steal prey from spiders' webs. On Guadalupe Island, off Baja California, the local subspecies *guadeloupensis* of the American Rock Wren, restricted to that island, has learnt to frequent slaughterhouses, where it feeds on flies attracted to the offal. Another example of opportunism concerns the Cactus Wren. In suburban situations in the American South-west, some individuals of this species have discovered that the squashed insects on the radiators of cars are a reliable source of conveniently pre-cooked protein.

Breeding

Among different groups of wrens there exist a number of breeding features and strategies that are quite unusual in passerines.



All Thryothorus *species build globe-shaped nests with side entrances. The nest of the* ***Banded Wren*** *is fairly typical, being shaped like an old-fashioned chemical retort hung in the crotch of a tree. It has an entrance-tube sloping downwards on one side of the support and a nest-chamber on the other.* Thryothorus *wrens tend to nest fairly low down, usually less than 3 m up and often very close to the ground. This species deters predators by building its nest in irritating nettle-bushes, next to the pendant nests of wasps and hornets, or in bull's horn acacias* (Acacia collinsii *and* A. cornigera). *These trees, pictured here, are inhabited by aggressive ants which provide vicarious protection from many types of egg thief.*

[*Thryothorus pleurostictus ravus*, Santa Rosa National Park, Costa Rica. Photo: Marie Read]



In common with other Campylorhynchus *wrens, the* ***Cactus Wren*** *builds a large, conspicuous, pouch-shaped nest, with a side entrance leading to an inner cavity. The materials most frequently used for the outer layers are grass and plant fibres, while the nest-chamber is lined with softer items such as feathers and down. Artificial material is incorporated when available: in this case the nest seems to have been reinforced with waste paper, and decorated with lengths of blue thread, black thread and cotton wool. To discourage predators, the most inaccessible locations are selected. The heart of a cholla cactus* (Opuntia), *for example, seems unlikely to receive unwelcome visitors.*

[*Campylorhynchus brunneicapillus couesi*, Arizona, USA. Photo: David Hosking/ FLPA]

These include polygamy, usually in the form of polygyny but also, more rarely, polyandry, as well as co-operative breeding and an extraordinary degree of multiple nest-building. It should, however, be admitted that there are major gaps in our knowledge of the breeding biology of the Troglodytidae. Indeed, for more than a quarter of the tropical wrens, not even has the nest been described, and detailed studies of the breeding strategy exist for only a few species.

The fact that wrens build more than one nest in a single season has been well known for many years. In England, for example, many decades ago, every bird-nesting schoolboy was familiar with the phenomenon of the "cock's nests" of the Northern Wren. The degree of multiple-nesting varies greatly among wren genera, apparently not occurring at all in some, but reaching an extraordinary degree in the *Cistothorus* marsh wrens, and a peak in the Marsh Wren itself. Male Marsh Wrens may, in the course of a season, construct up to twenty separate nests. From among these the female will then choose a suitable one, which she then completes, or she may even, apparently, induce the male to build yet more. It takes the male perhaps two days to build a candidate nest, but it can require eight days for both sexes to complete the nest that is to be used for breeding. Given the very substantial resources demanded of the male for this construction bonanza, there must be a major payback in evolutionary terms. The precise nature of this is, however, a matter of considerable debate. Certainly, in the event of a disaster befalling a breeding nest, it is obviously advantageous to have a half-completed back-up nest at hand. In a cat-tail marsh, where it is not easy to conceal a nest, the presence of numerous "decoy" nests may confuse a predator, and it is perhaps significant that the Sedge Wren, which nests in more tangled vegetation where concealment is easier, builds only half as many surplus nests as does the Marsh Wren. It has been suggested that the sheer vigour of a male's nest-building activities may indicate to the female his breeding fitness. Surplus nests are also useful for roosting, but why would twenty such nests be required? Probably, no single hypothesis completely explains the phenomenon. The building of additional nests for roosting is widespread among the members of this family. In the case of some species, such as the White-breasted Wood-wren, the Riverside Wren and the White-bellied Wren, the dormitory nests are slighter in construction and more poorly concealed than are the breeding nests, and the roosting nest of the Plain Wren, for example, is so flimsy that the bird can make an emergency exit by bursting out through the back wall.

For a number of genera, among them *Odontorchilus*, *Hylorchilus* and *Microcerculus*, there is no documented evidence that multiple nests are built, although this may be due to a lack of observation. Many *Thryothorus* wrens build dormitory nests but not, apparently, multiple breeding nests. One species, the Carolina Wren, a debatable member of this genus (see Systematics), occasionally builds spare nests in the breeding season. By way of contrast, the constructing of multiple nests appears to be standard in the genus *Troglodytes*, at least for those of its members which have been adequately studied. In Europe, Northern Wrens build half a dozen or more nests in each breeding season, although the number is smaller in western North America, as it is also, evidently, in the case of island populations of this species. Similarly, male Northern House Wrens construct multiple nests and, indeed, throughout the breeding season, they seem incapable of resisting the temptation to drop a few twigs into suitable cavities, often to the discomfiture and annoyance of the rightful owners. Among the *Campylorhynchus* species, the Rufous-naped Wren in El Salvador builds at least eight nests for each one actually used for breeding, at least some of the remainder serving as roosting sites. In Arizona, USA, the male Cactus Wren habitually starts to construct a second nest while his mate is incubating the first clutch; after this brood has fledged and become independent, the female will join in the completing of the second nest, which is immediately used for the rearing of a further brood.

Detailed study, with individually marked birds, is required in order to establish whether a wren species is routinely polygamous. In view of the paucity of such studies with regard to the species not occurring in Canada and the USA, it is not surprising that reproductive strategies are known for only a few of the tropical members of the family. In North America, on the other hand, extensive investigations have revealed that *Cistothorus* wrens are frequently polygynous. In one Canadian study of Marsh Wrens, undertaken in Manitoba, a total of 120 males consisted of ten bachelors, 53 monogamists, 48 bigamists and nine trigamists, suggesting an unequal sex ratio of about 0·65 males for each female. In contrast, a study in Georgia, in the south-east USA, revealed only 5% bigamous males. Being mated to a bigamist has



*The **Northern House Wren**, one of the best-known members of the family, is a cavity-nester. It lives commensally with man, and in line with this association it often nests in artificial sites, such as nestboxes, holes in walls, or cavities in sheds. Natural sites include the disused nests of orioles, swallows, kingfishers, and, as this photograph proves, those of woodpeckers. Wherever the cavity, and whichever its original excavator, male wrens pile up a large foundation of coarse twigs, leaves, bark and other material, on top of which females add a cup, and a lining of hair, wool and feathers. Cavity-nesting wrens do not build a roof over their nest.*

[*Troglodytes aedon*, Ontario, Canada. Photo: Arthur Morris/ Birds as Art]



Unlike most Campylorhynchus *species, the* ***Thrush-like Wren*** *regularly nests inside tree cavities, or holes in eaves. It is not a true cavity-nester, however, as it merely uses large apertures and always builds a roof over its nest. Moreover, most nests are not sited in cavities at all, but in the crotches of palms or the upper branches of trees. In these cases, the design is more typical of the genus: a disorganized dome of twigs and grasses with an outside ante-chamber and an inner breeding chamber. In their zeal, these boisterous wrens often collect odd materials to incorporate in their constructions, and thus some nests are festooned with snakeskins and scraps of plastic.*

[*Campylorhynchus turdinus hypostictus*, Serra dos Carajás, Pará, Brazil. Photo: Luiz Claudio Marigo]



The most interesting aspect of the reproductive behaviour of the ***Sedge Wren*** *is its nomadic nesting strategy. The race* stellaris, *pictured here, breeds between May and September every year, but in different regions the nesting period is concentrated at different times. This is apparently because northern birds breed first, then migrate to marshes further south, where they breed again. As a corollary of this mid-season, between-brood, migratory tendency, breeding birds are often so highly clumped as to appear colonial. The nest is a typical globe-shaped structure with a side entrance, located low down in sedges and tall grasses.*

[*Cistothorus platensis stellaris*, Pickering, Ontario, Canada. Photo: George K. Peck]

its disadvantages. For instance, female Marsh Wrens with promiscuous mates tend to receive short shrift from the partner when it comes to providing care for the nestlings, and are frequently left entirely to their own devices. Polygyny occurs also among Sedge Wrens, although less frequently than is the case with the related Marsh Wren. Female Sedge Wrens mated to an already mated male tend to nest later, to lay fewer eggs and to rear fewer young when compared with females in a monogamous relationship, and they rarely attempt a second brood; furthermore, their nestlings tend to weigh less than do those of monogamous parents, no doubt because they receive less food.

Polygamy is known to occur in those species of *Troglodytes* which have been studied. In western European populations of the Northern Wren, about half of the males are polygynous, although polygyny is apparently rarer among the North American races of this species. Substantial levels of polygyny have, however, been discovered in some populations of the Northern House Wren, especially in situations where surplus nest-sites are available. Secondary females tend to be less successful in rearing young than are primary ones, the latter having the help of the male in the feeding of nestlings. Notwithstanding this, some female Northern House Wrens seem preferentially to choose an already mated male, even when surplus bachelor males are available. Presumably, in those cases, the advantage of passing on one's own genes in combination with the genes of a particularly fecund male outweighs the reduction in the absolute number of offspring produced. In contrast to its northern relative, the Southern House Wren appears to be only rarely polygamous. In one detailed study of this species in Colombia, no instances of polygamy were observed, although, in a Panamanian study, both the active displacement of the male of a mated pair by an intruding male and the opportunistic taking-over of a bereaved female were recorded.

In an interesting study of Northern House Wrens that utilized nestboxes at the University of Wisconsin–Milwaukee Field Station, N. E. Poirier and colleagues found that mate-switching during a single breeding season was fairly common. Although this was initiated by the male, it was not correlated with his paternity of the first brood. It was found that males were more likely to change partner when unmated females were nearby. Such males generally started to advertise for a new mate during the incubation stage or the early part of the nestling stage at their first nest, and they successfully paired with a different female during and just after the nestling period. As mate-switching males sired more or less the same number of young as did males that stayed with the same partner, they appeared not to benefit directly from switching mates. Of the females that were deserted, on the other hand, half did not find a second mate during the breeding season and thus incurred a reproductive cost.

Co-operative breeding by birds is a more common phenomenon than was previously believed, having been documented for a number of different, unrelated avian families. Typically, it involves the assistance of individuals other than the mated pair in defending territories against conspecifics, in rearing young and in defence against predators. The "helpers at the nest", to use the phrase coined by Skutch, are usually blood relatives of the primary breeding pair. By enhancing the survival of that pair's young, the helpers also ensure the propagation of their own genes, albeit in a more diluted manner. Among the troglodytids, co-operative breeding reaches its most developed form in some of the tropical members of the genus *Campylorhynchus*. In the Stripe-backed Wren of Venezuela and Colombia, breeding groups can contain up to 14 individuals, consisting of a dominant breeding pair and numerous assistants, which are mainly the pair's offspring from previous broods. Several group-members may sing, and all may participate in defensive activities against, for example, Shiny Cowbirds (*Molothrus bonariensis*); the two dominant individuals, are, however, the only breeders and are the most persistent singers. All members of a group may assist in the rearing of the young, and breeding success is strongly correlated with the number of assistants available. The young wrens usually remain with their natal group for up to a year, after which all females, and the majority of males, disperse to nearby groups, thus reducing the potential for incest. Vacancies in large groups are much sought after and are the subject of much competition; small



*The domed nest of the **Marsh Wren** is built of thin strips of leaves and grass. It is about 18 cm high, 12 cm wide, and typically sits about a metre above water (or high-tide) level. Through a side entrance a cavity is reached, and this is lined by the female with fine leaves, cat-tail down, and feathers. The difficulty of concealing these bulky structures provides one explanation for the male's habit of constructing numerous nests: the wealth of unused sites may throw a predator off the scent. While this dilution effect could be a positive by-product of having multiple nests, it seems unlikely to explain the evolution of the male's industrious behaviour, which, in all likelihood, stems from a suite of factors. In any case, breeding nests can be distinguished from non-breeding nests, with practice, by the presence of a small sill below the entrance-hole. This sill seems to retain the eggs within the cavity, preventing them from rolling out in high winds.*

[*Cistothorus palustris palustris*,
Long Island,
New York, USA.
Photo: Tom Vezo]



Over the years, one of the strongest arguments against placement of the ***Donacobius*** *amongst the wrens has been that its nest, a very deep, cup-shaped structure, lacking a side entrance, and built mainly by the female, is unparalleled within this family. The female incubates the eggs alone, but both sexes provision the young, often assisted by one or two closely related helpers. Interestingly, adults have been reported dipping their underparts in water so that the brood is cooled during hot weather, and the nestlings' mouths are pink with three black spots, a pattern almost unique in South American passerines.*

[*Donacobius atricapilla atricapilla*, Minas Gerais, Brazil. Photo: Anita Studer]

groups, on the other hand, may have difficulty in filling vacancies. Individuals joining adjacent groups initially have a low rank within that group, but later rise to a senior breeding status.

The Fasciated Wren of western Ecuador and Peru has been less intensively studied than has its close relative the Stripe-backed Wren, but it appears to have a well-developed co-operative breeding strategy, with groups of up to ten individuals for each breeding pair, the young of one year remaining to assist with nesting in the next year. Conventional, unaided pairs do also exist, however. As for other members of the genus *Campylorhynchus*, the degree of co-operative breeding varies both among species and within a given species. In a Venezuelan study, for example, two different populations of Bicoloured Wrens had quite different strategies. In one population, only 15% of nests had a helper, and then only a single one, whereas more than half of the nests in the other population had assistants, often several of them and of both sexes. Some other *Campylorhynchus* species show some degree of co-operative breeding, but the strategy seems to be less pronounced in the more northerly species. The Cactus Wren, resident in the southern USA and the northern half of Mexico, is essentially a conventional breeder. On rare occasions juveniles of one brood have been seen to bring food to a subsequent brood, but this seems to be exceptional.

Of particular interest is the reproductive behaviour of the recently described subspecies *hernandezi* of Apolinar's Wren, which differs from the nominate race in indulging in classic co-operative breeding, with group defence of the territory but only one pair nesting. This appears to be the first report of this reproductive strategy, as opposed to polygamy, for the genus *Cistothorus*.

Finally, co-operative breeding has been suspected also for the Peruvian Wren (*Cinnycerthia peruana*). In this case, the variable amount of white feathering on the face of adults may indicate social and breeding status.

With the exception of the cavity-nesting species, and disregarding the atypical Donacobius, all wrens build an enclosed, roofed nest with a side entrance. In the genera *Henicorhina*, *Cistothorus*, *Troglodytes*, *Campylorhynchus*, *Thryorchilus* and *Ferminia*, and in some *Thryothorus*, the general nest form is an ovoid ball made from grass, rootlets and fibres and with a hole at the side. In the case of the Marsh Wren, the breeding nests are distinguished from surplus or dummy nests by the fact that they have a sill at the entrance, which prevents the eggs from rolling out in windy conditions. The female usually lines the nest with finer material, hair and feathers. In other troglodytid genera, the nests are more elaborate in form, often with an entrance tube pointing downwards. That of the White-bellied Wren, in the monotypic genus *Uropsila*, is a beautifully woven structure resembling an old-fashioned chemical retort, with an ovoid nesting chamber and downward-pointing entrance tunnel. Some *Thryothorus* species, such as the Happy and Sinaloa Wrens, build a similar type of two-part nest, often draped over a twig so that the breeding chamber is on one side and the entrance on the other. A similarly shaped nest, suspended over a twig, is made by the Peruvian Wren, but the nests of the other three members of the genus *Cinnycerthia* have not been described. Likewise, the nest of the Song Wren, the best-known member of *Cyphorhinus*, is boomerang-shaped, an untidy structure of coarse roots and leaf skeletons placed over a thin branch.

Cavity-nesting wrens do not build a roof over the nest. Males of both the Northern House Wren and the Southern House Wren fill the nesting cavity almost completely with coarse twigs, or even with such items as bits of rusty wire, before the female, after adding more twigs, builds a cup and lines this with hair, wool and feathers. Information on the nests of the four *Microcerculus* species is scanty, but those described are open structures made from dead leaves.

The crevice-nesting Canyon Wren constructs an open cup of wool, hair and feathers on a base of twigs and moss. Frequently, extraneous matter is included. One especially larcenous Canyon Wren in California regularly pilfered an extraordinary collection of loot from a nearby office, to the total of 600 paper clips, 500 pins, 100 matches and such other miscellaneous sundries as pennibs, screws and similar odd items. The American Rock Wren, also a crevice-nester, has the peculiar habit of building a nest foundation of pebbles. The expenditure of energy for this is by no means trivial; one nest of this species, the only member of the genus *Salpinctes*, had 2·2 kg of pebbles, the equivalent of 120 times the 18-g body weight of the wren itself, with the largest pebble, at 6 g, weighing almost a third of the bird's own weight. The evolutionary advantage of this major expenditure of energy is obscure; curiously, similar behaviour is exhibited by the Black Wheatear (*Oenanthe leucura*), an inhabitant of rocky slopes in

Spain and Morocco. The Thrush-like Wren (*Campylorhynchus turdinus*) of central South America also frequently includes extraneous objects in its nest, a habit which has given rise to local legend in Bolivia (see Relationship with Man).

In certain cases, the form of the nest is dependent on the selected nest-site. Thus, the Carolina Wren usually builds a domed nest, but in totally enclosed sites, such as nestboxes, it may reduce or omit the roof. Bewick's Wrens, too, will build either an open nest or a domed one according to circumstances.

There is much variation in nest-sites among the Troglodytidae, and sometimes even among members of the same genus. Most wrens nest in vegetation of various kinds, the *Thryothorus* and some *Troglodytes* species typically in dense brush, *Cistothorus* and *Ferminia* in grasses and rushes, and *Campylorhynchus* in various bushes and cacti. Other species are cavity-nesters. In North America, for example, the Northern House Wren relies heavily on artificial sites, both nestboxes and such incidental locations as cavities in sheds, but it also uses natural cavities such as woodpecker (Picidae) holes and a variety of other sites; the latter include old nests of paper wasps (*Polistes*), from which the wren first removes some of the interior structure, and the riverbank burrows of Belted Kingfishers (*Megaceryle alcyon*), the mud-bottle nests of Cliff Swallows (*Petrochelidon pyrrhonota*) and the pendent nests of Northern Orioles (*Icterus galbula*). The petrophilous wrens, those in the genera *Salpinctes*, *Catherpes* and *Hylorchilus*, nest in rock crevices, while the Southern Nightingale-wren, in *Microcerculus*, utilizes the disused burrows of other species, either in sandy banks or in old termite (Isoptera) nests.

Several members of the family have learnt to place their nests in naturally defended sites. A prime example is that of the Cactus Wren, which makes little effort to conceal its nests, instead building them in the savagely spiny cholla cactus, which acts as an effective deterrent to such predators as raccoons (*Procyon lotor*) and ring-tails (*Bassaricus astutus*). Some other troglodytids nest in spiny bromeliads or nettles. Several species, in different genera, routinely site their nests in places where they can obtain vicarious protection, by hostile insects, from such mammalian predators as monkeys. Thus, the Sinaloa and Happy Wrens frequently build in bushes next to the nests of hornets (*Vespa*). In the American tropics, there exists a curious symbiotic relationship between ants of the genus *Pseudomyrmex* and bull's-horn acacia trees. The ants nest in the hollow acacia thorns and feed on nectar and small nutritious corpuscles, called "Beltian bodies", provided by the tree; in return for this board and lodging, the ants defend the trees against predatory insects and, further, even remove weeds from the ground around the trunk of emerging plants. Bull's-horn acacias thus represent a very hostile environment, one where the ants are in effect "kept by the acacia as a standing army" and savagely attack the unwary intruder. Several wrens have learnt to capitalize on this, by siting their nests in such trees. The White-bellied Wren in Guatemala almost invariably nests in acacias, and in Costa Rica the Rufous-naped Wren goes even further, actively seeking out trees with the most aggressive ants and defending them against birds of other species. Wrens building in such secure locations appear to make little effort to conceal their nests. In contrast, the Bicoloured Wren, which does not routinely build in ant-inhabited trees, hides its nests much more effectively. Although the presence of wrens' nests would seem to confer no obvious advantage either on the tree or on the ants, the birds and their young are not molested by the insects.

The Troglodytidae exhibit considerable variation not only in nest-sites, but also in egg colour and in clutch size. Egg colour can vary within a genus, and sometimes even within a species. In the genus *Thryothorus*, some species lay immaculate white eggs or, more rarely, pale blue, bluish-green or deep sky-blue ones, while the eggs of other species are whitish or buff-white with a variable amount of brown or cinnamon speckling or blotching. Similar variation occurs in the genus *Campylorhynchus*: the eggs of the majority of its members are whitish with speckles or blotches of various shades of brown, but those of the Stripe-backed and Band-backed Wrens are plain white. In the case of the Cactus Wren, even different subspecies lay distinctive eggs, *affinis* in southern Baja California having paler eggs than those of the races in coastal California, and inland races having egg markings that are more brightly coloured. Similarly, the Sedge Wren lays white eggs in most parts of its huge range, but in Tierra del Fuego the local race *hornensis* lays speckled eggs, and an Aleutian race of the Northern Wren, *meligerus*, has white eggs, in contrast to the heavily marked eggs of other subspecies. A further example of intraspecific variation is provided by the Marsh



*The **Moustached Wren** is an abundant and familiar bird across a large swathe of South America, but there is almost nothing on record about its nesting behaviour. Its nest and eggs have apparently never been described, and it is not clear whether it breeds co-operatively. This is a wonderful example of the mismatch of scientific attention focused on temperate and tropical birds, the latter having been largely ignored until recently. We might speculate that, like most wrens, it feeds its nestlings a diet of insects (indeed, this individual is carrying a hymenopteran for its brood), but clarification of the simple aspects of its breeding biology can only result from studies in the field.*

[*Thryothorus genibarbis genibarbis*,
Alagoas, Brazil.
Photo: Anita Studer]



In most well-studied wrens the female broods alone, but both parents feed the young large numbers of insects. The ***Northern Wren*** *is no exception. The eggs of this species are tiny, and the clutches it lays are correspondingly large, ranging from three to nine eggs, with five to eight eggs being entirely normal. Even larger clutches (up to 17 eggs) have been recorded, but these are probably the result of two females laying in one nest. Even so, normal clutches hatch into a lot of hungry mouths, and this keeps both adults busy for 14–19 days.*

[*Troglodytes troglodytes troglodytes*, Navalmoral de la Sierra, Ávila, Spain. Photo: Juan Manuel Hernández]

Wren, the eggs of which are usually chocolate-coloured or brown, spotted with darker brown, but some individuals appear to lay clutches of white eggs. Sometimes, single white eggs also appear in a clutch.

There is a general tendency among passerines for clutch sizes to be smaller in tropical regions than they are in temperate ones, while tropical species, perhaps as a means of compensating for this low fecundity, have longer breeding seasons and, often, more broods. This principle seems to hold for most troglodytids, and, indeed, is sometimes apparent even within one species. Thus, the wood-wrens, the *Microcerculus* wrens and the *Cyphorhinus* wrens, among other tropical species, lay only two eggs. The clutches of many tropical members of the genus *Thryothorus* often consist of only two or three eggs, whereas the Happy and Sinaloa Wrens, temperate representatives of the same genus in northern Mexico, usually lay five. For the Cactus Wren, the normal clutch in Arizona is of three to five eggs, rarely up to seven, but the same species in Baja California usually lays just two eggs. Similar variations are found in other species, representing several genera. Frequently, as demonstrated by the Northern Wren and the American Rock Wren, island subspecies have smaller clutches than those of their mainland counterparts.

Wrens are usually multi-brooded, insofar as the local climate allows. In temperate regions, with a constrained breeding season, there is a rush to launch one brood successfully before starting another one. Parental care of the fledged young tends, therefore, to be of short duration in North America and Europe, while in many tropical species the family-members remain together as a feeding party for several months after leaving the nest. This doubtless enhances the survival rates of offspring and thereby compensates for smaller clutches. An exception to this general tropical strategy is provided by the Southern House Wren. Athough the clutch size of this species is small when compared with that of the closely related Northern House Wren, the Southern House breeds rapidly and frequently, one female in Colombia having been observed to raise as many as seven broods in a period of just 17 months.

Incubation of the eggs seems to be the duty exclusively of the female. In some cases, she may be fed on the nest by the male, although in polygynous species, such as the Marsh Wren, she usually receives lamentably poor provision. Incubation periods tend to be longer among the larger species than among the smaller ones. For example, the Cactus Wren sits for up to 23 days and other *Campylorhynchus* species for 17–20 days, whereas the duration can be as short as 12 days for the American Rock Wren and the Canyon Wren. The incubation period of the small wood-wrens, however, is usually 18–20 days. The nestlings are generally fed by both parents, but in the case of polygynous species the contribution of the male may amount to little or nothing. Among the co-operative breeders, on the other hand, a variable number of helpers assist with brood-feeding.

In the tropics, the young wrens frequently associate with their parents for a prolonged period after fledging, in some cases for almost a year. Parental feeding of the fledglings is probably limited to a much shorter period, but with many species the parents and juveniles remain together as a family unit for months on end. It is easy speculate how such associations may evolve into the co-operative nesting behaviour so typical of the tropical *Campylorhynchus* wrens; after all, if the time is not right for the individual to reproduce, the next best option for it to propagate its own genes is to enhance the survival of its own siblings, even those of different broods.

Interestingly, in Costa Rica, young Southern House Wrens of one brood have been observed to assist in the feeding of their parents' subsequent broods, even though this behaviour seems to be rare for this *Troglodytes* species. Among temperate members of this genus, such as the Northern House Wren or the Northern Wren, parental care of fledged young is of short duration, usually lasting for no more than two weeks, after which the juveniles are left on their own. One could speculate that, for migratory species, the necessity of building up fat reserves prior to migration could have a greater survival benefit in terms of "the selfish gene" than does the enhancing of the survival of one's siblings.

The domed nest form of most wrens and the cavity-nesting habit of the remainder appear to provide these birds with some protection from parasitic species. Nevertheless, brood parasitism is a significant factor in reducing the nesting success of certain troglodytids. In some parts of the USA, up to 25% of Carolina Wren nests fail as a result of parasitism by the Brown-headed Cowbird (*Molothrus ater*). In the Neotropics, the Shiny Cowbird is generally the main culprit in this respect, although it is not a major problem for troglodytids in this region. On the other hand,



The nests of the ***Northern Wren*** *are located in a variety of sites, frequently in dense vegetation but also in cavities and crevices. Favoured spots include ivy-covered trunks and walls, and the tangled roots of fallen trees, but in truth the range of locations is so broad that it is difficult to identify preferences. Wherever they breed, they lodge their nests in well-concealed sites, and leave a tiny aperture for their comings and goings, thereby minimizing predation. Another hazard usually avoided is that of brood parasitism. Old World cuckoos* (Cuculus) *and New World cowbirds* (Molothrus) *sometimes lay in the nests of Northern Wrens, but rarely. They are probably kept at bay by the closed structure and narrow entrance to the nest itself. Indeed, it is not impossible that domed nests evolved in wrens not only in response to predation but also to brood parasitism. Either way, they seem to have proved a rather effective deterrent.*

[*Troglodytes troglodytes*. Photo: Stephen Dalton/ NHPA]

two *Thryothorus* species, the Rufous-and-white and Buff-breasted Wrens, are frequent victims of the American Striped Cuckoo (*Tapera naevia*) in South America, and the Northern Wren in Europe is occasionally parasitized by the Common Cuckoo (*Cuculus canorus*).

Finally, the nesting habits of the Donacobius exhibit several interesting features, formerly used by taxonomists to argue for this species' inclusion in or, paradoxically, its exclusion from the Troglodytidae. This is a co-operative nester, at least in situations where it occurs at high density. The breeding unit varies from simply the nesting pair alone to groups of up to four individuals. The nest is an open cup, quite unlike that of any other member of the family, and is built in vegetation, often over or at the edge of water. Over most of its range, which extends from east Panama across to the east coast of Brazil and southwards, east of the Andes, to north-east Argentina, the Donacobius lays a clutch usually of two eggs, but in Brazil frequently of three. The eggs, purplish-white and covered by heavy purplish blotches, are incubated by the female alone, for a period of about 16–18 days. A curious habit of the adults is that of cooling the nestlings by wetting them with water brought on the adults' breast feathers. The breeding success of this species is correlated with the amount of help available; pairs without helpers are usually able to rear only one chick to fledging, whereas those with helpers can succeed in raising two or three young. In contrast to most wrens, the Donacobius appears to be single-brooded.

Movements

The great majority of wren species appear to be very sedentary. In other words, not only is the species found in a particular location throughout the year, but probably the very same individuals are present there in all months. After leaving the family group, the juveniles will disperse, probably in a random manner, until they encounter a vacant territory. In the case of the co-operatively nesting Stripe-backed Wren, the young of both sexes remain with the breeding group for a year or so, after which all females and the majority of males disperse to breed with nearby groups; the distance in terms of linear displacement may, however, be very short.

Most tropical wrens appear to be sedentary even when faced with major climatic fluctuations, such as the wet and dry seasons of Central America and northern South America. In a few cases, some altitudinal movement appears to occur, although the data are scanty and the precise nature of the movement not clearly understood. For example, the Merida Wren seems to vacate some habitats during the rainy season, and in El Salvador the Rufous-and-white Wren occurs in winter at sea-level in thickets of the palm *Bactris subglobosa*, a habitat known locally as "*huiscoyol*", whereas it is not found below 300 m in the summer. At the northern edge of its range, in the Sierra Madre of Mexico, the Happy Wren migrates vertically, but no such movements have been noted farther south in its range.

When one moves into temperate zones, however, it is noticeable that troglodytids become increasingly less sedentary. The North American populations of the Sedge Wren, for instance, are totally migratory, with no overlap at all between the breeding range, which extends from Saskatchewan east to Quebec and south to Kentucky and Pennsylvania, and the non-breeding range, mainly in the coastal states from Virginia south to north-eastern Mexico. These North American populations are also unique in that they are nomadic during the breeding season, abandoning some areas and, later in the same season, appearing in others. In contrast, the Sedge Wrens in Middle America, from the highlands of southern Mexico southwards to Costa Rica, seem to be entirely sedentary. In South America, too, the Sedge Wren populations, which may perhaps represent two separate species (see Systematics), are similarly non-migratory; here, the southernmost subspecies, *hornensis*, experiences very harsh conditions during the austral winter, although the type specimen of this taxon was taken on a ship "twenty leagues south-east of Cape Horn", suggesting that some movement may occur at times.

A similar distinction in the movements of different populations is exhibited by the Marsh Wren complex of taxa. Those summering in the vast area from northern Alberta eastwards to New England are entirely migratory, spending the winter months along the Atlantic seaboard from New York south to Mexico, whereas the subspecies breeding in coastal habitat in the eastern USA are either partial migrants, in the north, or sedentary. In some coastal marshes in the southern-eastern USA, the Marsh Wren populations present in winter are a mixture of sed-



Both sexes of ***Marsh Wren*** *generally provision the brood, but not so polygamous males, which are somewhat negligent of their parental duties. Nestlings are nurtured intensively for 13–15 days, receiving a wide variety of insects along the way, in this case a fairly large aquatic species, perhaps a newly emerged dragonfly. After fledging, young wrens may be fed by one or more parents for another couple of days or so, but they achieve full independence very rapidly.*

[*Cistothorus palustris palustris*, Dryden Lake, New York, USA. Photo: Marie Read]

entary local breeders and winter visitors from farther north. A totally sedentary race is found in central Mexico. Vagrant Marsh Wrens have been recorded in Bermuda and Cuba, illustrating this species' ability to cross large expanses of open water.

In western North America, the American Rock Wren is partially migratory. It vacates the northern portion of its range, from British Columbia south to Colorado, in winter, whereas the species is present throughout the year in the remainder of the western USA and in Mexico; again, disjunct populations from south Mexico south to Costa Rica are totally sedentary. The American Rock Wren is a notable vagrant, stray individuals turning up, usually in October and November, in various places across eastern North America, from Newfoundland and New Jersey south to Louisiana and Florida. The Canyon Wren, on the other hand, appears to be much more sedentary. Although it does undertake some altitudinal movements in the northern parts of its range, occurrences of vagrants are fewer, and in localities closer to the breeding area.

A very limited partial migration takes place in the case of Bewick's Wren, the eastern populations of which are more mobile than are the western ones. Carolina Wrens are essentially sedentary, but they do crop up extralimitally, sometimes in locations well removed from the breeding range. Of over 500 recoveries of individuals of this species ringed in North America, only 31 had made any movement at all, and only three demonstrated significant displacement, having covered distances of, respectively, 250 km, 150 km and 75 km. Extralimital movements made by the Carolina Wren may involve wandering by juveniles in their first season.

The two *Troglodytes* species breeding in North America are strongly migratory. For the Northern House Wren, a large body of data has been amassed from recoveries of ringed birds, and this information allows a detailed analysis of movements; for no other wren species in the Americas are there adequate data for such studies. The Northern House Wren is totally migratory; apart from a small area of southern California, there is no part of its range where it occurs in all months of the year. Individuals ringed on the breeding grounds in coastal eastern North America appear to winter in Florida. Inland breeders, from east of the Appalachians, migrate on a broad front to non-breeding quarters extending mostly from Texas eastwards to Georgia and Florida, those from the eastern part of the breeding range tending to winter farther east than do those from more westerly areas; there are, however, a few recoveries demonstrating strong longitudinal displacements, as, for example, from Ontario south-west to as far as Texas. Northern House Wrens breeding on the Great Plains and the Prairie Provinces of Canada, in contrast, have a strongly south-eastern orientation of migration. There are no significant recoveries of house wrens ringed in western North America. This species has occurred as a vagrant in western Cuba, the Bahamas, Newfoundland, and as far north as Churchill, in the Canadian province of Manitoba.

The Southern House Wren, incidentally, is essentially sedentary over most of its vast range, although it displays a remarkable ability to appear in small isolated patches of suitable habitat when these are created by human activity. The populations in extreme southern South America, however, are truly migratory, leaving southern Tierra del Fuego during the austral winter. The precise whereabouts of their non-breeding quarters are not known, and no information on their movements is available from any ringing studies.

For the other *Troglodytes* wren of the Nearctic, the Northern Wren, the situation is more complex. The bulk of the breeding range, from northern British Columbia across southern Canada to Newfoundland, is vacated after the breeding season, when the wrens migrate to a wintering range that extends from New England south to Florida, Texas and north-eastern Mexico; the species occurs in all months in southern Ontario and the Appalachian chain, but it is not certain that it is the same individuals that are present there throughout the year. Western North American populations may be partially migratory or sedentary. The numerous endemic subspecies of the Aleutian chain and the Pribilof Islands are known to be totally sedentary, and those breeding in the region from Alaska south through northern California appear to be so. In southern California and Arizona, however, the species does occur in winter but is absent in the summer months.

In the Old World, the Northern Wren again comprises a mixture of sedentary and migratory populations. The species leaves most of Scandinavia and north-western Russia after breeding, as it appears unable to tolerate winter conditions north of the –7°C



Towards the end of the nestling period, an adult ***Northern Wren*** *arrives at the nest every few minutes with a billful of prey. When this frantic provisioning finally bears fruit, and the nestlings fledge like a stream of fluffy balls spilling from the tiny entrance, it often seems incredible that so many could fit, never mind survive and grow, in such a small and firmly constructed cavity. Once out of the nest they are fed for a further 9–18 days before becoming totally independent.*

[*Troglodytes troglodytes hiemalis*, Thunder Bay, Ontario, Canada. Photo: Wayne Lankinen/ DRK]



There is a relationship between latitude and several forms of breeding data in wrens. Clutch size in the ***Northern House Wren****, for example, increases with latitude, while the number of broods decreases. Northern birds suffer lower temperatures and a shorter insect emergence. Perhaps predictably, therefore, they often only manage a single brood per year, this becoming two broods further south, while birds in the southernmost reaches of the range are regularly triple-brooded.*

[*Troglodytes aedon aedon*, Pennsylvania, USA. Photo: Joe McDonald/ Auscape]

isotherm. In western Europe, from Iceland south to the Mediterranean Basin, and from the south Baltic region south to Poland and the Ukraine, the Northern Wren occurs throughout the year, as it does also in north Africa, Turkey, Cyprus, the Caucasus and northern Iran. Isolated island populations, such as those on the Faeroes and St Kilda, are also sedentary. Farther east, in the Himalayan region, eastern China, Japan and Taiwan, it is likewise observed in all months. The breeding grounds in northern China and eastern Siberia, including Kamchatka and Sakhalin Island, are vacated in winter, although the species is resident on the Commander Islands, east of Kamchatka.

Whereas there are, unfortunately, no worthwhile ringing data for the Northern Wren in North America, a substantial number of ringing recoveries exists in Europe. Individuals breeding in Norway have been encountered in winter in the region from northern Germany south to Belgium; wrens from Sweden and the Baltic area tend to have a generally, but not exclusively, south-western orientation, with recoveries reported from Hungary westwards, all the way to south-western France and eastern Spain. Northern Wren movements in Britain seem to be of two distinct types. The first is a short-distance movement of up to 50 km, and is essentially random in orientation, while the second is longer, up to 250 km, and with a markedly north-south orientation between summer and winter and the reverse heading in spring. A number of wrens that had been ringed at locations on the south coast of England have been recovered in France, including several in the south of that country. These may well have involved individuals that were already on migration when they were caught for ringing, since it is obvious that the vast bulk of British Northern Wrens, which are subspecifically distinct from mainland European ones, do not leave the British Isles.

Observations of birds striking tall buildings, TV towers, lighthouses and similar structures at night, or being found dead in the morning at such places, indicate that all migratory troglodytid species in North America and Europe migrate nocturnally. This can occasionally lead to considerable mortality (see Status and Conservation).

It is worth mentioning here that the Donacobius, almost certainly not a "true" wren (see Systematics), appears to be a very sedentary species. In one study in Peru, in which birds were individually marked, there was no evidence of any movement between patches of suitable habitat that were separated by a distance of only 2 km.

Relationship with Man

In crass economic terms, wrens have little impact on human beings. Their habitats, whether they be forest, scrubland, marsh or desert, rarely impinge upon agriculture. Apart from a few records of the larger *Campylorhynchus* wrens attacking soft fruit, the members of this family seldom interact, for good or ill, with farming. There is the possibility that, in certain geographically restricted cases, various wren species may make a modest contribution to local economies in terms of attracting birdwatching visitors. If arrangements for such small-scale tourism were handled properly, species such as the Zapata Wren of Cuba could doubtless bring in minor amounts of hard currency from visiting ornithologists, and a little employment for local people, without further endangering the species itself. Any such economic benefit, however, will always be indeed modest; wrens are, after all, neither lions nor elephants.

In contrast to the minimal economic interaction between the Troglodytidae and humans, the role of wrens in folklore and legend is extraordinarily widespread and pervasive. This is especially true of the Northern Wren in Europe. It is odd that a small, brown, inedible bird should be so important in the folklores of so many diverse cultures. Indeed, in western Europe, among passerines, probably only the European Robin (*Erithacus rubecula*) figures more prominently. Doubtless, this is due in some measure to the loudness of its song. Certainly, the songs of the members of this family make them difficult to overlook. In Canada, for example, the name for the Northern House Wren in the Ojibway language of Ontario translates literally as "he who makes a lot of noise for his size".

One common feature in many different cultures is the recognition of the wren as the "King of the Birds". In a number of European languages, as diverse as Dutch, Classical Greek, Polish, Romanian and Lithuanian, among others, the vernacular name for the Northern Wren implies royalty. One example is the Ger-



*The nest of the **Canyon Wren** is unusual. It is an open cup of wool, hair and other material, with a base of coarser twigs, built by both sexes in a shady recess or rocky crevice, but also frequently in ruined buildings and other artificial sites. Some individuals incorporate artificial debris into the structure, an inexplicable habit taken to extremes by the nest-building pair in California which pilfered 100 matches, 500 pins and 600 paper clips, plus a collection of similar junk, from a nearby office.*

[*Catherpes mexicanus*, Kickapoo Cavern State Park, Texas, USA. Photo: George K. Peck]

man *Zaunkönig*, meaning "king of the fence". Elsewhere, however, the mantle of royalty seems to have been taken over by the even smaller *Regulus* kinglets, which, for example, are known in France and Spain respectively as *roitelet* and *reyezuelo*.

How did the tiny wren become the birds' king? One legend, widespread among several European cultures, tells of a contest among the birds for the throne; the one which could fly the highest would inherit the crown. As might be expected, this was the eagle. As the eagle, exhausted and incapable of further climbing, was about to call down to the unsuccessful claimants below to proclaim his triumph, the wren, which had concealed itself among the eagle's back feathers or, in some versions, under his wing, popped out and flew a few feet higher. The origin of this widespread legend is obscure, but it may have come from one of Aesop's fables, since lost. Aesop himself probably acquired many of his fables from Indian sources, although, curiously, an almost identical legend is found among the Canadian Ojibway people.

An obviously related legend, again widespread in western Europe, involves the bringing of fire, or light, to the world by the wren. This entailed a flight to the heavens from which the wren returned successfully, but with all of his feathers burnt off. In gratitude, all except one of the birds agreed to give the wren one of their own feathers so that he could clothe his nakedness. The single exception was the owl, which maintained that he had none to spare. As punishment for his stinginess, the owl was for ever thereafter condemned to a solitary life; harassed by small birds during the day, and spending the nights alone in the dark forest, making forlorn and mournful hooting noises. A variation of this story identifies the robin as the fire-fetcher, although in Breton legend it was Hell, not Heaven, that provided the fire. In eastern Europe, the fire-bringer was the swallow.

A remarkable tradition, formerly practised in much of western Europe, was the wren hunt. Typically, this took place on St Stephen's day, or Boxing Day, 26th December, although in some locations it happened on Christmas Eve, on Christmas morning, on the Epiphany, or "Twelfth Night", or even on St Valentine's Day. Basically, groups of young boys would catch wrens and attach them to decorated poles, a holly bush (*Ilex*) or, in Wales, a house adorned with ribbons. The unfortunate bird would then be paraded by a procession of boys and young men in strange and fantastic garb, some dressed as women, sometimes with blackened faces and carrying wooden swords; in Ireland, the parade took place to the accompaniment of doggerel verse and the music of flutes and the *bodhrán*, a traditional drum. The young participants then went from door to door, soliciting modest funds and treats. In the Isle of Man, the wren would sometimes then be interred with due solemnity and respect, to the sound of dirges sung in the now extinct Manx language. Wren-hunting occurred widely in the British Isles, not only in the Celtic areas but also in such counties as Suffolk and Surrey, as well as in parts of France. The tradition seems to have been strongest, however, in southern Ireland and the Isle of Man. Manx fishermen carried wren feathers with them to sea as protection against shipwreck, while in Scotland fisherfolk scattered wren feathers into the wind in the belief that this would enable them to predict the profitability of the herring (*Clupea harengus*) harvest.

The origins of the wren hunt are obscure. According to one legend, the wren betrayed St Stephen as he was trying to escape from jail, thereby causing his martyrdom. There are several Irish legends. In one of these, the wren was cursed by St Moling for eating the holy man's pet fly. In another, a wren (presumably a Protestant wren!) was blamed for warning King William of Orange's sleeping forces of a stealthy Irish attack, by jumping up and down on a drum; most interestingly, exactly the same story existed seven hundred years earlier, but in this case it was somnolent Danes who were aroused. In all probability, the origins of the tradition date back to early or pre-Christian times. In Celtic mythology, for example, the wren was the king of the oak tree and the symbol of the Old Year, while the robin represented the New Year, hence the symbolic dispatch of the wren at a time close to the winter solstice.

In the New World, wren mythology seems to be less extensive or, in cultures lacking the written word, perhaps simply unrecorded. According to Cherokee legend, the wren closely observes women in labour, rejoicing in the birth of a girl but loudly lamenting the appearance of a boy, who will grow up to hunt the wren. In Suriname, the haunting and arresting song of the Musician Wren is reckoned to be a bad omen for hunters. In contrast, the Southern Nightingale-wren is considered to be a good talisman for deer-hunters in Brazil, although, to be effica-



*As with many cavity-nesters, nest hygiene is of paramount importance to the **Northern Wren**. This individual is carrying away a faecal sac in an act of cleanliness which is likely to increase survivorship, both for itself and its offspring. The broods of this species are so large that adults leave carrying a faecal sac almost every time they visit the nest, at least in the latter stages of the nestling period. Failure to do this would result in a dangerously fouled and malodorous cavity, and a nest entrance advertised with white excrement, features that would not only attract predators, but increase the likelihood of disease.*

[*Troglodytes troglodytes pacificus*, Queets, Olympic National Park, Washington, USA. Photo: Rob Curtis/ The Early Birder]

cious for this purpose, the bird must be captured on a Thursday or Friday during a period when the moon is waxing. The habit of some species of incorporating human artefacts in their nests (see Breeding) has led to a number of superstitious beliefs. The Thrush-like Wren, for example, frequently includes extraneous objects in its nest and, according to local legend in Bolivia, if one loses a banknote, one should examine all the local wren nests to ascertain whether the thrifty birds have incorporated it into their own nest structures.

Finally, there is the curious fact that, in the Creole languages of the West Indies, the Southern House Wren is endowed not with royalty, but also with divinity. On English-speaking islands it is called "God-bird" and on French ones "*Oiseau Bon Dieu*", while in Suriname it is known as "*Gadofowroe*".

Broadly speaking, wrens are looked upon with some affection by the general public. This is presumably due largely to their small size. This may perhaps have been in the minds of the members of the German Union for Nature Conservation when they selected the Northern Wren as the "Bird of the Year" for 2004. That body stated that the Northern Wren, although not threatened, is a symbol of a natural, diverse environment that must be maintained and protected.

*Wherever the **Northern Wren** is a garden bird, which happens to be the case across much of its range, it is known by affectionate nicknames. A veritable "troglodyte" with fearless and inquisitive habits, it seeks secluded cave-like niches for its nest, a search that regularly leads into man-made structures, especially garden huts and tool sheds. Pairs breed in an astounding variety of locations, including empty plant pots and the pockets of hanging coats. If an old teapot or a rusty kettle is lodged in ivy for wrens, they take to it cheerfully, as they do to wooden nestboxes. Indeed, large numbers of wrens sometimes roost communally in natural or artificial sites during severe weather; in one instance, 96 wrens were seen to emerge from a single roost.*

[*Troglodytes troglodytes*. Photo: John Daniels/ Ardea]

Status and Conservation

The fate of different troglodytids at the hands of man is very varied. Some species have greatly benefited from human activity, whereas others have suffered sorely. In North America, the clearing of continuous climax forest during the period of European settlement created the forest-edge habitat suitable for the Northern House Wren and Bewick's Wren, while artificial structures provided secure nesting sites, allowing for major expansions in the range of both species. In the USA, Northern House Wrens colonized western West Virginia by the late 1800s, North Carolina by the 1920s and South Carolina by the 1940s. Bewick's Wren had expanded into West Virginia by 1834, Pennsylvania by 1843, Georgia by 1854, Ohio by 1879 and New Jersey by 1890, and had reached southern Ontario, in Canada, by 1898. In contrast to the house wren, however, Bewick's Wren has suffered major declines in the eastern part of its range and now occurs only in isolated pockets east of the Mississippi; it has been proposed that the race concerned, *altus*, be listed as Endangered. The reasons for this major decline are not entirely clear, but one plausible explanation is the well-documented nest destruction by Northern House Wrens (see General Habits). The latter may, in fact, represent a conservation problem under some circumstances. In Canada, the cavity-nesting Prothonotary Warbler is confined to southern Ontario, the entire population totalling fewer than two dozen pairs. Its nesting success is adversely affected on a substantial scale by Northern House Wrens, being significantly higher in areas without these nest-destroyers. The wrens cause nesting failure by puncturing and sometimes throwing out the warbler's eggs, attacking nestlings and perhaps adults, and dropping twigs into nest-cavities already occupied by the warblers. The decline of Bewick's Wren in eastern North America seems to have coincided with the expansion of the range of the Northern House Wren. Although the attributing of the disappearance of Bewick's Wren to the Northern House Wren's activities may be a facile explanation of a more complex phenomenon, the evidence is suggestive.

The two *Cistothorus* wrens of North America have rather specialized habitat requirements, the Marsh Wren occurring in reeds, rushes and grasses over water and the Sedge Wren in damp sedgy meadows. Since Europeans settled in North America, Marsh Wren habitat has been extensively destroyed as wetlands have been drained for agriculture and other purposes. The species' total population has doubtless declined substantially, but it remains common or abundant in suitable habitat, which in some areas is now expanding as a result of the building of artificial water impoundments. It is probable that the Sedge Wren was helped by the creation of habitat through human clearances; this wren may also breed in weedy rice fields, although these are discouraged in modern farming practices. Nevertheless, Sedge Wrens are regarded as threatened in several US states. In Canada, breeding-bird surveys over the decade 1991–2000 indicate a slow population increase.





*The range of the **Wing-banded Wren** spans much of Amazonia from the Guianas to south-east Peru. Across this huge expanse it is sympatric with the Southern Nightingale-Wren* (Microcerculus marginatus)*, but it is almost always rarer than its congener, perhaps because it is more strongly tied to undisturbed forests. Its patchy distribution notwithstanding, the extent of its occurrence is too large to permit its inclusion in any threatened category, or even the holding bay of Near-threatened. Like the other* Microcerculus *wrens, it nests in cavities: only two nests have so far been described, both built some 2 m up in vacated burrows, probably initially excavated by jacamars (Galbulidae).*

[*Microcerculus bambla bambla*, Iwokrama, Guyana. Photo: Doug Wechsler/ VIREO]

No species of wren has become extinct in historical times, but several give cause for concern, and a number of subspecies have indeed disappeared. Of these, the race *exsul* of the American Rock Wren, restricted to the island of Isla San Benedicto in the Revillagigedo Group, off western Mexico, became extinct in the most spectacular fashion in 1952, when its island home catastrophically erupted. A few wrens survived the initial eruption, which also killed tens of thousands of nesting seabirds, and lingered for a few months, but all ultimately perished. All other extinctions have been caused by man, usually by the sadly familiar practices of habitat destruction and the introduction of alien predators. Two island subspecies of Bewick's Wren have been lost: *brevicauda* was one of several Guadelupe endemic taxa that vanished from that island, off Baja California, prior to 1892, and *leucophrys*, of San Clemente Island, California, became extinct by, probably, 1986. In the West Indies, the Martinique race of the Southern House Wren became extinct about 1900. Two other races of that species, *guadeloupensis* on Guadeloupe and *mesoleucus* on St Lucia, are hovering on the brink, if they have not already gone over it; the first was believed to be extinct, but a tiny population was rediscovered in 1969 and 1973, and the second still persisted, in very small numbers, in 1984. No recent information is available for either subspecies. On some other islands, such as Dominica, the local races of the Southern House Wren remain common. Given the ability of this species, over most of its range, to adapt to or, indeed, to benefit from human-wrought changes, the loss of some of the races is perhaps unexpected. It can doubtless be ascribed to the typical vulnerability of naive island populations to introduced predators, in these instances predominantly mongooses (Herpestidae).

Populations of some island races of the Northern Wren fluctuate, at times plummeting to alarmingly low levels. In Scotland, for example, the subspecies *fridarensis*, confined to the 7·6 km² of Fair Isle, between the Shetlands and the Orkney Islands, has numbered as few as ten singing males, but it rapidly bounced back to three or five times this level. When the taxon *hirtensis* was first described on St Kilda, the westernmost of the Outer Hebrides, in 1884, it was initially considered to be a new species; this unleashed a frenzy of collecting, with single skins fetching a guinea or more, the equivalent of £1.05 in modern British currency, which was at that time a huge sum of money for an impoverished local Gael. Notwithstanding this, *hirtensis*, now treated as a subspecies of the Northern Wren, was probably never in danger, mainly because of the physical inaccessibility of much of the population, and nowadays it typically numbers more than 200 pairs. At the eastern edge of the Northern Wren's Palearctic range, the subspecies *mosukei* on the Izu Islands, south of the Japanese mainland, is considered endangered, while the subspecies *orii* recently became extinct on the Daito Islands, about 800 km south of Kyushu.

Several troglodytid species are confined to islands of various sizes, but, in contrast to the sad condition of the West Indian races of the Southern House Wren, all of them should survive. The Cozumel Wren (*Troglodytes beani*) is restricted to the Mexican island of that name, where it is generally both abundant and tolerant of moderate habitat modification. Off the other, western coast of Mexico, in the Revillagigedo Archipelago, are the much smaller islands of Clarión and Socorro, each with an endemic wren. Because of the small size of their respective ranges, the Clarion Wren (*Troglodytes tanneri*) is classified by conservationists as Vulnerable and the Socorro Wren is considered to be Near-threatened. Both islands have suffered substantial habitat changes following the introduction of such animals as goats and cats, but the wrens appear able to tolerate this environmental alteration. This situation contrasts with that of the Socorro Mockingbird (*Mimodes graysoni*), which is in a very sorry state and is listed as Critical. Fortunately, the archipelago is now a biosphere reserve, and efforts are being made to remove alien species.

In the Falkland Islands, the endemic Cobb's Wren was probably widespread throughout prior to human settlement, but it has since retreated to offshore islands in the face of habitat destruction and the introduction of cats and rats (*Rattus*). Although classified as Vulnerable owing to its restricted range, it has an estimated population of 4000–8000 pairs, spaced over more than thirty islands of between 5 ha and 3000 ha, and does not seem to be in any real danger. Accidental introduction of either cats or rats to any of these islands, however, would almost certainly result in the disappearance of the local wren population. Efforts are currently being made to exterminate alien predators on several of the more suitable islands.



*The **Superciliated Wren** is a Tumbesian endemic, restricted to seasonally arid landscapes in southwest Ecuador and northwest Peru. Dry forests in this region are being damaged at a tremendous rate, triggering the inclusion of this species in the Near-threatened category. Nonetheless, it escapes red-listing because it thrives in scrubland and hedgerows, as well as in taller forests, and its population is therefore relatively large and stable.*

[*Thryothorus superciliaris baroni*, Chaparri Ecological Reserve, Lambayeque, Peru. Photo: Heinz Plenge]

Most of the conservation worries concerning troglodytids refer to Central and South American members of the family. No fewer than four species of concern occur in Colombia, a country in which an almost permanent state of severe civil unrest is not conducive to conservation efforts in remote regions. The species at the most serious and most immediate risk is Niceforo's Wren (*Thryothorus nicefori*), which was described in 1945 from a small area near Bucaramanga and was then not seen again until 1989, when one pair was observed. It appears to be dependent on acacia scrub, a habitat which is highly disturbed by burning, overgrazing and clearance for agriculture. Niceforo's Wren is presently classified as Critical.

Apolinar's Wren, "officially" listed as Endangered, is restricted to tiny patches of habitat in Colombia, where recent study has revealed the existence of two separate populations. These are currently treated as representing subspecies, but each is perhaps deserving of full species status (see Systematics). The nominate race is found only in reedbeds around a number of high-altitude lakes. Unfortunately, many of these are in heavily populated areas in the departments of Cundinamarca and Boyacá, and much suitable habitat has been lost in recent years. Populations of 50 or so pairs exist at Laguna de Tota, in Boyacá, and at Laguna de Fúquene, in Cundinamarca; the species apparently still persists in some locations around Bogotá, and the type specimen was, in fact, collected only about 6·5 km from the capital city. Some of the breeding habitat of this taxon lies within national parks, but, given the current state of civil unrest in Colombia, park status may be no guarantee of protection. Recent estimates of the total population of the nominate race are in the region of 250 adults, justifying for this taxon a classification of Critical. A further cause for concern with this race involves a growing incidence of brood parasitism by the Shiny Cowbird, the local population of which appears to be increasing. The other subspecies of Apolinar's Wren, *hernandezi*, has so far been found in just two small locations. Its population density at these seems to be quite high, and the sites themselves do not appear to be under immediate threat. It is possible that this race may occur also at other places with suitable habitat, but, because of concerns over security, it has not yet been possible to investigate these. In view of the tiny currently known range of *hernandezi*, it is suggested that it be afforded the conservation category of Vulnerable.

Although the Santa Marta Wren is not "officially" listed as globally threatened, it has a very limited total range, being confined to higher levels in the massif of Santa Marta, in north Colombia; notwithstanding the supposedly protected status of much of its range, which is encompassed within a national park, habitat destruction, including overgrazing, burning and forest-cutting, continues apace, suggesting that the species should be designated as, at best, Vulnerable. The recently discovered Munchique Woodwren (see Systematics) has a very small range in the western Andes of Colombia. At first, this range was thought to amount to less than 100 km² in an area suffering habitat destruction, and talk was that the species should be placed in the Critical category. However, very recently a new population has been found

*The **Bar-winged Woodwren** is found in the mountains of northern Peru, on either side of the River Marañón, and it also occurs in southernmost Ecuador in the Cordillera del Cóndor. Due to this relatively circumscribed distribution, it qualifies as a Restricted-range species, but it is not thought to be in any immediate threat of extinction. Indeed, forests within its altitudinal range are still fairly intact, largely because they contain few commercial timber species, and stand on infertile soils. As such this wren remains rather common at several sites.*

[*Henicorhina leucoptera*, Abra Patricia, San Martín, Peru. Photo: Jon Hornbuckle]





***Cobb's Wren** is an insular offshoot of the "House Wren complex". It was once abundant on the Falkland Islands, but the arrival of man and his commensals, notably cats and rats, prompted a population crash. It is now restricted to 30 or more uninhabited offshore islands, where it is thought to number between 4000 and 8000 individuals. Although it seems to be secure, further accidental introductions of mammalian predators could eliminate some crucial populations, and it is therefore listed as Vulnerable. Efforts are currently being made to eradicate alien mammals from a number of suitable islets.*

[*Troglodytes cobbi*, Falkland Islands. Photo: Hanne & Jens Eriksen]

some 350 km to the north; here, the bird seems to be common, and much of the unprospected intervening area supports apparently suitable habitat, so the prospects are improving. The Merida Wren of the Venezuelan Andes, despite its very restricted range, does not appear to be at any risk.

The two members of the Mexican genus *Hylorchilus* might almost be regarded as island species in that they live only in forest growing on isolated outcrops of karst limestone. Whether they ever occurred in the intervening non-karst areas is something of a moot point, since these have been largely deforested for agriculture. Both species are the subject of some concern. Sumichrast's Wren seems to be in the better shape. Although its total range is encompassed in an area of only 6000 km², in only a small proportion of which it is actually present, a total of twelve separate populations has been located. In some of these it is found at the very high density of one pair per hectare, and it is able to exploit very small patches of habitat, some as tiny as 0·5 hectares. In addition, it tolerates a degree of habitat disturbance. Sumichrast's Wren is currently considered Near-threatened, the greatest threats facing it being the cutting of forest for firewood and quarrying. Nava's Wren is classified as Vulnerable, with suggestions that it should be upgraded to the conservation category of Endangered. It appears to be less tolerant of habitat disturbance than is its congener. Some parts of its range are protected, but the viability of both species can be guaranteed only by further land protection, either by direct acquisition for reserves or through long-term agreements with landowners.

Farther south, in El Salvador, the local subspecies *nannoides* of the Rufous-browed Wren is now restricted to a protected area of 600 ha on Volcán Santa Ana. Here, its population is estimated to number no more than about 4000 individuals.

The unique Zapata Wren, confined entirely to small areas of the Zapata Swamp, in south-western Cuba, is a source of very serious concern. It is currently classified as Endangered, and at one point it was feared that it was already extinct. Recent observations, however, suggest a population in the region of 120–140 pairs. The main threats to this species appear to be destruction of its habitat by fires and predation by introduced mongooses. Currently, management plans for the Zapata Swamp are in place, with the aim of preserving this and several other endemic species.

Twenty-one troglodytids, including five of the six globally threatened ones, are restricted-range species. Of the non-threatened species in this category, it is believed that their small geographical ranges would render them vulnerable in the event of major habitat destruction. In southern Mexico, for instance, the Giant Wren is restricted to a narrow coastal strip of the state of Chiapas. It seems to be abundant in parts of this small range, and to be able to co-exist well with present land uses, but any change in its environment could cause problems for this distinctive wren.



*The **Zapata Wren** has always been restricted to drier areas of the Zapata swamp, in the Caribbean island of Cuba, where it favours savanna-type habitat with sawgrass* (Cladium jamaicense), *rushes, and a few bushes to use as songposts. The total population has recently been estimated at 120-140 pairs, quite extensively but patchily distributed throughout the swamp. Given the fact that so few individuals survive, and the continuing threat of grass-burning, the species is treated as Endangered. Fortunately, its status has generated a considerable amount of interest and a conservation project is under way.*

[*Ferminia cerverai*, Zapata, Cuba. Photo: Albert Masó]



***Niceforo's Wren**, one of the least known members of the family, is quite possibly close to extinction. It was described on the basis of seven specimens taken in 1945, but went unseen thereafter until 1989, and is now classed as Critical. It occurs in a highly restricted area around San Gil, Santander, Colombia, where it is apparently unable to tolerate recent changes in land use. Much of its natural habitat has been converted to coffee plantations, or is overgrazed by cattle and goats. Surveys are needed to clarify its current status, but also to assess its validity as a species separate from the Rufous-and-white Wren* (Thryothorus rufalbus).

[*Thryothorus nicefori*, near San Gil, Santander, Colombia. Photo: John S. Dunning]

On the Caribbean coast, the Yucatan Wren (*Campylorhynchus yucatanicus*) occupies an even smaller range, some of which is protected by national parks. This, however, is no justification for complacency, as the Yucatán Peninsula is currently undergoing extensive development for resorts. As a further example, the Bar-winged Wood-wren, already listed as Near-threatened, occurs in very limited areas on high mountains in southern Ecuador and northern Peru, where it is confined to stunted forest on impoverished soils. This choice of habitat, unattractive for human exploitation, is probably the species' best guarantee for survival. Also highly restricted in Peru is the Inca Wren, which does, however, seem to be common in suitable areas.

Although many members of the family have large geographical ranges, these are becoming increasingly fragmented. This is especially true of species which rely on lowland tropical forest and have limited tolerance of change, such as the Northern Nightingale-wren, large segments of the former habitat of which have been deforested. While such species may be abundant in areas where suitable habitat still remains, their populations as a whole have exhibited substantial declines in recent years. The future health and viability of these forest-reliant species will obviously depend on the capacity of the human population to reverse the present rate of habitat destruction in Central and South America.

Apart from habitat loss and degradation, there appear to be few threats to troglodytids. As mentioned previously (see Movements), non-resident populations of wrens migrate during the night-time. These nocturnal movements can at times involve certain hazards, chief among which is probably the risk of flying into stationary structures such as lighthouses, TV towers and various tall buildings. Observations suggest that, under certain weather conditions, Northern House Wrens, Marsh Wrens and Sedge Wrens in North America and Northern Wrens in Europe can suffer substantial numbers of casualties as a consequence of hitting tall obstructions in the dark. The level of mortality due to such accidents, however, is extremely minimal in terms of the total population of the species concerned.

Natural deaths resulting from starvation during prolonged periods of harsh weather can be more serious, sometimes depressing populations for several years. Nevertheless, wrens are generally capable of recovering to their former strength within a relatively short length of time.

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PLATE 35

inches 4

cm 10

Genus *CAMPYLORHYNCHUS* Spix, 1824

1. Boucard's Wren

Campylorhynchus jocosus

French: Troglodyte de Boucard **Spanish**: Cucarachero del Balsas
German: Harlekinzaunkönig
Other common names: Boucard's Cactus-wren

Taxonomy. *Campylorhynchus jocosus* P. L. Sclater, 1860, Oaxaca, Mexico.
Has been thought by some to form a superspecies with *C. yucatanicus* and *C. brunneicapillus*. Sometimes treated as conspecific with *C. gularis*, but the two are quite distinct in appearance and probably occupy slightly different ecological niches. Monotypic.
Distribution. SC Mexico (S Puebla, S Morelos, Guerrero and Oaxaca).



Descriptive notes. 17 cm; 23·8–29·8 g. Has dull white supercilium, dull blackish eyestripe, dark grey ear-coverts; crown dark chocolate-brown, nape rufescent, shoulders blackish with whitish longitudinal streaks, back reddish-brown with scattered black and white spots; rump dull rufescent brown, rectrices grey-brown with dull blackish-brown bars, outer ones with whitish tips; primaries and secondaries blackish-brown with pale buff bars; chin and throat white, underparts white with conspicuous black spots, flanks buffy with diffuse darker bars; eye red-brown; bill blackish, pale bluish-grey base of lower mandible; legs greyish-slate. Sexes similar, spots on underparts of female tend to be smaller than male's. Juvenile has markings on back less well defined, throat speckled, underparts dull greyish with spots duller and more diffuse. Voice. Song a series of grating notes repeated up to a dozen times, also a harsh rapid chatter; sexes sing in duet.
Habitat. Dry or arid forest, sometimes with giant cacti. Arid subtropical scrub, also pine–oak (*Pinus–Quercus*) forest and oak scrub; mostly 800–2500 m, occasionally as low as 600 m. Can tolerate considerable disturbance of habitat.
Food and Feeding. Both animal and vegetable matter; insects and other invertebrates, also cactus seeds, etc. Whether or not it eats scorpions (Scorpiones), as implied in one Spanish vernacular name, is not known. Forages from ground level up to tops of cacti and trees; less often on ground than *C. brunneicapillus*.
Breeding. Nests with eggs in mid-Jun and early Jul in Oaxaca; nest-building observed in Apr, and pre-juvenile mid-Jul; probably single-brooded. Nest domed, with side entrance. Eggs 3–4, whitish with dense speckles of brown and grey; no information on incubation and fledging periods; apparently, individuals other than the two parents sometimes assist at nest. One recorded instance of parasitism by Brown-headed Cowbird (*Molothrus ater*).
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Confined to small area in S Mexico, mostly in states of Oaxaca and Guerrero. Fairly common in some parts of range, less so in others. Able to tolerate substantial human modification of habitat, provided that sufficient scrub and bushes remain.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Binford (1989), Blake (1953), Farley (1994), Forcey (2002), Friedmann (1971), Hellmayr (1934), Howell & Webb (1995), Hunn *et al.* (2001), Peterson, Escalona *et al.* (2003), Ramírez & Ramírez (2002), Ridgway (1904), Rowley (1984), Selander (1964).

2. Spotted Wren

Campylorhynchus gularis

French: Troglodyte tacheté **German**: Bartzaunkönig **Spanish**: Cucarachero Manchado
Other common names: Spotted Cactus-wren, Mexican Wren

Taxonomy. *Campylorhynchus gularis* P. L. Sclater, 1861, Bolaños, Jalisco, Mexico.
Sometimes treated as conspecific with *C. jocosus*, but the two are quite distinct in appearance and probably occupy slightly different ecological niches. Considerable individual variation in some characters (e.g. degree of spotting on underparts), but differences appear insufficiently constant to warrant separation of distinct races. Monotypic.
Distribution. Mexico, in two disjunct populations separated by unsuitable habitat: in W, from SE Sonora S to N Michoacán and W México; in E, from SW Tamaulipas S to Hidalgo.



Descriptive notes. 17 cm; 28·3–31·0 g. Has whitish supercilium, brown lores and eyestripe, buffish-white ear-coverts; crown chestnut-brown, shoulders and back rufescent brown marked with dull black and buffy white; primaries and secondaries barred dark brown, buff and grey-brown; rectrices grey-brown, barred darker; chin, throat and chest off-white, narrow blackish malar stripe, chest side with conspicuous blackish spots; belly and lower flanks buffy, diffusely barred darker; eye reddish-brown; bill blackish above, pale bluish-grey below, yellowish base; legs greyish-slate. Sexes similar. Juvenile is very different, has crown unmarked dull black, upperpart markings more diffuse, chest unspotted pale buff. Voice. Song a series of harsh churring notes, or a series of unmusical gurgling phrases. Call a gruff "cheh-cheh-cheht".
Habitat. Varied. Oak and pine–oak (*Pinus–Quercus*) woodland, usually of a fairly dry nature, also mixed stands of leguminous shrubs and cacti; in Sonora, rocky slopes with palms. 800–2500 m; locally to 3000 m in Colima.
Food and Feeding. Little information. Diet mostly invertebrates, but some vegetable matter such as cactus seeds taken. Has been seen to take small lizards. Forages actively in small groups, on or near ground, occasionally higher, to c. 15 m; seeks food in bark crevices and among rocks, also in clumps of epiphytes.
Breeding. Largely unknown. Nests in Sonora in Jun. Nest domed, with side entrance; one in Sonora was located on underside of dead palm frond. Clutch size unknown, but up to four fledglings seen together; eggs undescribed; no information on incubation and fledging periods. One recorded case of parasitism by Brown-headed Cowbird (*Molothrus ater*).
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Abundance varies; quite sparse and uncommon in some areas, and very common in suitable habitat in others.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Edwards & Martin (1955), Farley (1955, 1994), Gaulden (1996), Hellmayr (1934), Howell & Webb (1995), Hutto (1980, 1987), Lea & Edwards (1950), Ridgway (1904), Russell & Monson (1998), Selander (1964), Webster (1958), Zimmerman & Harry (1951).

3. Yucatan Wren

Campylorhynchus yucatanicus

French: Troglodyte du Yucatan **German**: Yucatanzaunkönig **Spanish**: Cucarachero Yucateco
Other common names: Yucatan Cactus-wren

Taxonomy. *Heleodytes brunneicapillus yucatanicus* Hellmayr, 1934, Río Lagartos, Yucatán, Mexico.
Has been thought by some to form a superspecies with *C. jocosus* and *C. brunneicapillus*. Sometimes regarded as a race of latter, but differs significantly in plumage, voice, behaviour and nest form. Monotypic.
Distribution. N coast of Yucatán Peninsula from approximately Celestún E to El Cuyo (mostly in Yucatán state, marginally N Campeche), in E Mexico.



Descriptive notes. 18 cm; 31–40 g. Has off-white supercilium, dark brown eyestripe, ear-coverts finely streaked brownish-grey; crown blackish-brown, shoulders and back dark brown with longitudinal white streaks; primaries and secondaries conspicuously barred off-white and dull blackish-brown, with greater and lesser upperwing-coverts barred dull black and off-white; tail barred blackish-brown and dull grey-white; chin, throat and chest off-white with fine longitudinal streaks, heavier on chest; lower flanks diffusely barred, undertail-coverts barred dull blackish; eye red-brown; bill grey-black, pale greyish-horn base of lower mandible; legs dark grey. Sexes similar. Juvenile has all markings less well defined, bars on wing-coverts buffy, eye brownish. Voice. Song a series of 4–5 repeated notes, e.g. "chick che-wa chooo" etc, quite distinct from that of *C. brunneicapillus*; duetting by both sexes common. Call a harsh growl.
Habitat. Coastal scrubland with scattered bushes 3–6 m in height, sometimes with *Opuntia* cacti; also, less commonly, in areas such as bushy edges of pastures. Extends only a few km inland.
Food and Feeding. No data on diet available. Forages in pairs and family groups, on ground and in low vegetation.
Breeding. Season probably Mar–May or later. Nest built by both sexes, an ovoid ball of grass with side entrance, usually c. 2–3 m above ground in bush; nest less spherical than that of *C. brunneicapillus*, and not sited preferentially in cactus; multiple nests probably constructed and used for roosting. Eggs undescribed; incubation and fledging periods unknown.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Yucatán Peninsula Coastal Scrub EBA. Common or abundant in undisturbed prime habitat, less so in marginal habitat such as brushy field edges; seems able to tolerate some disturbance. Occurs in several protected areas, i.e. Ría Celestún, San Felipe and Río Lagartos National Parks. Would be highly vulnerable to extensive coastal development such as has occurred very intensely on E coast of Yucatán Peninsula; so far, much of the species' range has not attracted too much development of this type, but any shift in the focus of holiday-resort development from the Cancún–Playa del Carmen axis to coastal areas farther N & W could be very damaging.
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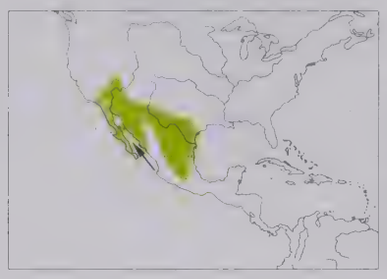
4. Cactus Wren

Campylorhynchus brunneicapillus

French: Troglodyte des cactus **German**: Kaktuszaunkönig **Spanish**: Cucarachero Desértico
Other common names: Northern Cactus Wren

Taxonomy. *Picolaptes brunneicapillus* Lafresnaye, 1835, California; error = Guaymas, Sonora, Mexico.
Has been thought by some to form a superspecies with *C. jocosus* and *C. yucatanicus*. Sometimes regarded as conspecific with latter, but differs significantly in plumage, voice, behaviour and nest form. USA and N Mexican population sometimes referred to as race *anthonyi*, but name *couesi* has priority. Eight subspecies recognized.
Subspecies and Distribution.
C. b. couesi Sharpe, 1882 – S USA (S Nevada, SW Utah, S Arizona, S New Mexico, S Texas) and NW & NC Mexico (N Sonora, N & E Chihuahua, N Coahuila).
C. b. sandiegense Rea, 1986 – extreme SW USA (coastal S California) and NW Baja California.
C. b. bryanti (Anthony, 1894) – W coast of Baja California (between 31° N and 29°30' N).
C. b. purus (van Rossem, 1930) – both coasts of Baja California between c. 29° N and 25° N.
C. b. seri (van Rossem, 1932) – Tiburón I, in Gulf of California.
C. b. affinis Xántus de Vesey, 1860 – S Baja California (S from 25° N).
C. b. brunneicapillus (Lafresnaye, 1835) – NW Mexico (C Sonora S to N Sinaloa).
C. b. guttatus (Gould, 1837) – C Mexican plateau from Nuevo León S to Michoacán and Hidalgo.

On following pages: 5. Giant Wren (*Campylorhynchus chiapensis*); 6. Bicoloured Wren (*Campylorhynchus griseus*); 7. Rufous-naped Wren (*Campylorhynchus rufinucha*); 8. Thrush-like Wren (*Campylorhynchus turdinus*).



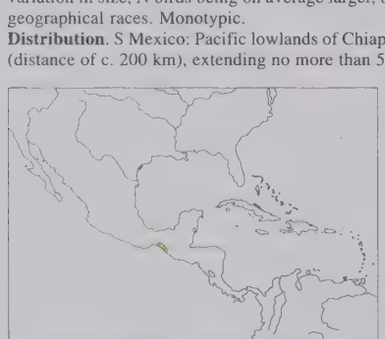
Descriptive notes. 18–19 cm; 33·4–46·9 g. Nominate race has supercilium white, ear-coverts streaked dark grey and white, crown unmarked chocolate-brown with rufescent tinge, nape brown with white streaks, back and rump grey-brown with white and black streaks; primaries and secondaries strongly barred blackish and off-white; rectrices with brownish-black and pale grey-brown bars, outer ones tipped white; chin white, throat and upper chest heavily marked with black on whitish background, belly whitish with darker streaks, flanks and lower underparts ochraceous buff; eye reddish-brown; bill dull blackish, base of lower mandible paler greyish; legs brown or pinkish-brown. Sexes similar. Juvenile has no white streaks on nape or back, black markings on chest less prominent, eye muddy grey-brown. Race *couesi* is larger than nominate, posterior underparts paler; *sandiegense* is less rufescent on crown; *bryanti* is darker and browner above than nominate, with conspicuous white streaks on rump and scapulars; *purus* has almost pure white underparts, little buff on flanks; *seri* has less cinnamon-buff on underparts than nominate, wider abdominal spotting; *affinis* has pale underparts with black markings reduced, distinct white bars on all rectrices except middle pair; *guttatus* is more grey, duller than nominate, with less conspicuous white markings on upperparts. Voice. Song a series of harsh "jar-jar-jar" notes. Alarm a low buzz, also a repeated staccato "tek".
Habitat. Semi-desert of various vegetational types, including Sonoran and Chihuahuan Deserts. Requires the presence of spiny cacti such as prickly pear or cholla (*Opuntia*); absent from pure stands of creosote bush (*Larrea mexicana*) without such cacti. Sea-level to 1400 m in Arizona, more sparsely to 2000 m in New Mexico and C Mexican plateau.
Food and Feeding. Mostly animal matter, including hymenopterans (ants, wasps), grasshoppers (Orthoptera), spiders (Araneae) and other arthropods, also small frogs and lizards. Some vegetable matter, including cactus seeds, also taken. Forages low in vegetation or on ground; turns over ground debris, also stones and larger rocks, to locate prey hidden beneath; moves rapidly on ground. Some individuals learn to pry squashed insects from car radiator grills.
Breeding. Egg-laying from Feb, less often Jan, in USA (Arizona), later at high elevations; up to six broods may be attempted, usually only two or three succeed. Nest large and conspicuous, pouch-shaped, with side entrance leading to retort-shaped cavity, built of grass and fibres and lined with feathers, some artificial material sometimes incorporated when available; usually located in spiny cactus, sometimes in other bush, rarely in artificial situation such as in cavity in eaves; nests for roosting built throughout year. Eggs 3–5, rarely up to 7, in N, usually only 2 in race *affinis* (in Baja California), buffy-pinkish with fine brown or reddish-brown speckles, some geographical variation in egg colour, e.g. tending to be dark in *sandiegense*, considerably paler in *affinis*; incubation by female alone, period c. 16 days (up to 23); chicks fed by both sexes, very rarely also by other individuals, fledging period in Arizona 19–23 days; male starts to build second nest while female is laying first clutch, she assists in completing it as soon as first brood is fledged, and shortly thereafter lays second clutch in it.
Movements. Almost entirely sedentary; of 126 recoveries of ringed individuals, only one showed any movement, and all others were found at, or very close to, initial ringing site. No occurrences outside normal range, apart from one bizarre record in Canada (Saskatchewan).
Status and Conservation. Not globally threatened. Generally common to abundant over much of its range. Has shown itself to be adaptable; can survive well in very degraded or modified habitats (e.g. in open industrial sites, junkyards and the like), so long as some suitable vegetation, especially spiny cacti, remains.
Bibliography. Anderson (1934a, 1934b), Anderson & Anderson (1957, 1959, 1960, 1961, 1962, 1963, 1965, 1973), Anon. (1998b), Antevs (1946), Austin (1974), Baicich & Harrison (1997), Bailey (1922), Bancroft (1923, 1930, 1946), Bent (1948), Blake (1953), Contreras (1997), Crooks *et al.* (2001), Facemire *et al.* (1990), Farley (1994), Guzmán *et al.* (2001), Hellmayr (1934), Howell & Webb (1995), Marr (1981), Marr & Raitt (1983), Mearns (1902), Milton *et al.* (1998), Parkes (1986), Phillips *et al.* (1964), Price *et al.* (1995), Proudfoot *et al.* (2000), Rea & Weaver (1990), Ricklefs (1966, 1967, 1968, 1975), Ricklefs & Hainsworth (1967), Ridgway (1904), Root (1988), Rowley (1935), Russell & Monson (1998), Selander (1964), Small (1994), Smith (1970), Udvardy (1963), Wapple & Smith (1982), Wolford (1969), Zink *et al.* (2001).

5. Giant Wren

Campylorhynchus chiapensis

French: Troglodyte géant **German**: Riesenzaunkönig **Spanish**: Cucarachero de Chiapas
Other common names: Giant Cactus-wren, Chiapas Wren

Taxonomy. *Campylorhynchus chiapensis* Salvin and Godman, 1891, Tonalá, Chiapas, Mexico.
Sometimes considered conspecific with *C. griseus*, but very widely separated geographically. Some variation in size, N birds being on average larger, but differences insufficient to warrant naming of geographical races. Monotypic.
Distribution. S Mexico: Pacific lowlands of Chiapas, from about Puerto Arista S to Puerto Madero (distance of c. 200 km), extending no more than 50 km inland.



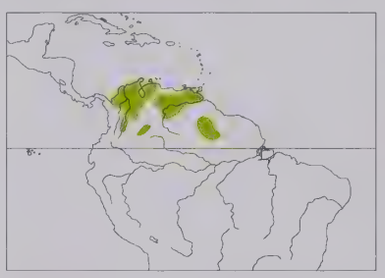
Descriptive notes. 20–22 cm; 43·4–57 g. Has prominent buff or whitish supercilium, black eyestripe, black crown, nape and shoulders; upperparts unstreaked bright chestnut-brown, rectrices dark chestnut-brown with conspicuous white subterminal band on all but cenral pair; flight-feathers greyish-black, secondaries edged chestnut and obscurely barred, upperwing-coverts rufous-brown; ear-coverts, chin, throat and chest white, belly and vent buff; eye reddish-brown; bill black above, grey with paler base below; legs pale slate-blue to greyish-brown. Sexes similar. Juvenile resembles adult, but underparts less pure white. Voice. Repeated rhythmic hollow phrases, chortling and rollicking; sexes sing in unison. Various grating and harsh churring calls.
Habitat. Variety of bushland, including such areas as farmyards modified by human activity, bushy fence rows and hedges; ideal habitat includes groves of guanacastes (*Enterolobium*) or mangoes (*Mangifera*) with denser patches of trees, and with bull's-horn acacias (*Acacia collinsii*) for nesting. Sea-level to 300 m.
Food and Feeding. No information recorded. Diet probably largely invertebrates. Feeds on or near ground, rarely at a great height, and is thus ecologically separated from *C. rufinucha*, which tends to feed in smaller branches; inspects fallen dead trees and bases of living trees. Has been seen to enter chicken coops, apparently attacking eggs therein.
Breeding. May–Jul; possibly double-brooded. Some evidence of multiple helpers at nest. Nest a bulky roofed structure c. 25–35 cm in diameter, circular entrance at side, built of straw, weed stems, pieces of vine etc., situated 3–4 m up and with little effort at concealment, frequently in bull's-horn acacia; latter has a symbiotic relationship with aggressive *Pseudomyrmex* ants, which attacks intruders but do not molest this species' nest. One clutch recorded, of 3 eggs, light buff with heavy mottling of brown; no information on incubation and fledging periods.
Movements. Apparently entirely sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in the North Central American Pacific Slope EBA. Frequently common or abundant within its small range; in prime habitat, groups found spaced at intervals of c. 100–150 m. Most of existing range is heavily modified by agriculture; the species seems to be very tolerant of such disturbance, provided that adequate hedgerow and bushes remain.
Bibliography. Anon. (1998b), Blake (1953), Brodkorb (1939), Ceballos & Valdelamar (2000), Howell & Webb (1995), Peterson *et al.* (1998), Ridgway (1904), Selander (1955, 1964), Skutch (1940, 1960, 1976).

6. Bicoloured Wren

Campylorhynchus griseus

French: Troglodyte bicolore **German**: Brauenzaunkönig **Spanish**: Cucarachero Currucuchú
Other common names: Bicoloured/Guyanian Cactus-wren

Taxonomy. *Furnarius griseus* Swainson, 1838, savannas of Guyana.
Sometimes considered conspecific with *C. chiapensis*, but very widely separated geographically. Five subspecies recognized.
Subspecies and Distribution.
C. g. albicilius (Bonaparte, 1854) – N Colombia and NW Venezuela (Macaraibo Basin, Falcón, Lara, W Trujillo).
C. g. bicolor (Pelzeln, 1875) – upper Magdalena Valley and W slope of E Andes in Santander and Boyacá (Colombia).
C. g. minor (Cabanis, 1851) – lowlands of N Venezuela (Cojedes and Apure E to Sucre and Monagas, S to N Bolívar) and E Colombia (Meta).
C. g. pallidus Phelps, Sr & Phelps, Jr, 1947 – N Amazonas, in Venezuela.
C. g. griseus (Swainson, 1838) – E Venezuela (NW Amazonas, NW Bolívar), SW Guyana and extreme N Brazil (Roraima).



Descriptive notes. 21–22 cm; 37–46·5 g. Nominate race has off-white supercilium contrasting with dark brown eyestripe; crown and nape dark chocolate-brown, back paler chocolate-brown; primaries and secondaries as back but with numerous darker bars; rectrices brownish-black with conspicuous white subterminal band on all but central pair, broadest on outer feathers; throat and entire underparts white; eye brown; bill black, grey base of lower mandible; legs slate-grey. Sexes similar. Juvenile has back greyer and less rufescent than adult, cap mottled grey-brown, underparts grey-white. Race *albicilius* is deeper rufous than nominate; *bicolor* is similar to previous, but less bright rufous on rump; *minor* is smaller, with blackish-brown nape and upper back; *pallidus* has back much more grey, less rufous, than nominate, with darker crown. Voice. Song a series of multiple loud gurgling notes, 2–5 per phrase, with harsh grating undertone, female song slightly different and invariably including a trill; marked geographical variation in song type, race *albicilius* in particular differing from e.g. *minor*; pair-members sing individually or in duet, or in choruses with three or more individuals singing simultaneously. Calls varied, mostly harsh and grating.
Habitat. Scattered bushland, of varied nature. In Colombia, race *bicolor* occurs in arid thorn-scrub with cacti, but other races in quite humid areas. Absent from both completely forested areas and completely open areas. Sea-level to 2100 m in Colombia, to 1600 m in Venezuela.
Food and Feeding. Mostly invertebrates; significant amounts of vegetable matter also taken, including berries, and reported as destructive to fruit such as mangoes. According to local Colombian tradition, enters hen-houses and preda
tes eggs. Forages in trees and palms, also on ground.
Breeding. Jan–Mar and May–Aug in Venezuela. Co-operative breeder, although extent to which this occurs highly variable, in some populations majority of nests have one or more helpers, in others only 15%; helpers are blood-relatives (frequently brothers or sisters) of nesting pair. Nest a domed structure with small side entrance, made of grass and fibres, placed 3·5 m or more above ground and well concealed in tree or palm; old domed nest of other species, e.g. tyrannid (of genus *Pitangus* or *Myiozetetes*), or pendent one, e.g. of Rufous-fronted Thornbird (*Phacellodomus rufifrons*), also used. Eggs 3–5, buff or cinnamon, speckled with brown; incubation by female alone, period 17 days; chicks fed by both sexes, and by helpers when present, for c. 17 days in nest and up to 30 days after fledging. Nests with helpers up to three times more successful than those without, enhanced success due to better defence of nest.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Frequently common or abundant. Able to tolerate substantial modification of habitat, provided that sufficient bushes remain; for example, can co-exist with agricultural practices such as ranching.
Bibliography. Austad & Kerry (1986), Austad & Rabenold (1986), Chapman (1917), Darlington (1931), Delacour (1923), Friedmann (1948), Haffer (1975), Haydock (1998), Haydock *et al.* (1996), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Miller (1947), Phelps & Phelps (1947), Rabenold *et al.* (1988), Ridgely & Tudor (1989), Selander (1964), Sick (1993, 1997), Snyder (1966), Thomas (1979).

7. Rufous-naped Wren

Campylorhynchus rufinucha

French: Troglodyte à nuque rousse **Spanish**: Cucarachero Nuquirrufo
German: Rotnacken-Zaunkönig

Other common names: Rufous-naped Cactus-wren; Sclater's Wren (*humilis*); Hooded Cactus-wren, Rufous-backed Wren (*capistratus* group)

Taxonomy. *Picolaptes rufinucha* Lesson, 1838, Veracruz, Mexico.
Some authors divide races into three informal groups: *humilis*; nominate; and the four remaining southernmost subspecies. Races *humilis* and *nigricaudatus* intergrade in S Mexico (Chiapas). Six subspecies recognized.
Subspecies and Distribution.
C. r. humilis P. L. Sclater, 1856 – W Mexico (Colima E to W Chiapas).
C. r. rufinucha (Lesson, 1838) – E Mexico (Veracruz and adjacent N Oaxaca).
C. r. nigricaudatus (Nelson, 1897) – S Mexico (Chiapas) and W Guatemala.
C. r. castaneus Ridgway, 1888 – interior of Guatemala E to Honduras and Nicaragua.
C. r. capistratus (Lesson, 1842) – Pacific coast of El Salvador and Nicaragua S to NW Costa Rica.
C. r. nicoyae A. R. Phillips, 1986 – Nicoya Peninsula, in NW Costa Rica.



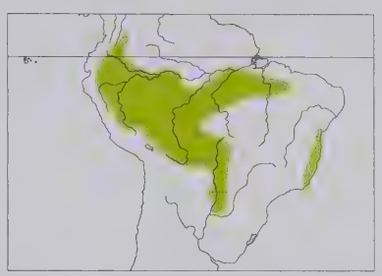
Descriptive notes. 15–19 cm; 28·9–31·8 g. Unmistakable over most of range. Nominate race has white supercilium, blackish lores and eyestripe; crown blackish, nape and back chestnut-brown, shoulders with black and white longitudinal streaks; primaries and secondaries and their coverts prominently barred blackish and brown; rectrices grey-brown with diffuse darker barring, prominent whiter tips on outermost three feathers runs into mgreyish-brown; chin and throat white, weak black malar stripe, chest pale buffy white with small round brownish-black dots, belly buff-white, diffuse blackish bars on flanks; eye red-brown; bill dark horn, paler at base; legs bluish-grey. Sexes similar. Juvenile is like adult, but supercilium buffy white, markings on back more diffuse, rufous of back duller. Race *humilis* has no streaks on shoulders, variable rufous-brown crown with dusky feathers centres, spots on underparts reduced or absent; *nigricaudatus* has blackish rectrices, unspotted underparts; *capistratus* has paler chestnut back than previous, light brownish-grey bars on central rectrices; *castaneus* is similar to last, but with much less variegated back markings; *nicoyae* is smaller, with anterior supercilium and side of chest strongly washed with brown. Voice. Song a prolonged series of rich chortling phrases, usually 3–8 notes, interspersed with harsher chatters; sexes duet. Calls short and harsh.
Habitat. Arid and semi-arid areas with dry scrub (especially with *Opuntia* cactus), including areas substantially modified by human activity; less commonly in mangroves and in lower levels of cloudforest. Occurs from sea-level to 1200 m in Mexico, to 1400 m in El Salvador and to 800 m in Costa Rica.
Food and Feeding. Feeds predominantly on invertebrates, especially small insects, spiders and so on; probably also takes some vegetable matter, including berries. Habitually forages in pairs or small groups, usually in low vegetation; sometimes seeks food on verandahs or even actually inside buildings.
Breeding. Season mid-Mar to Jul, mostly Apr–Jun, in El Salvador; probably single-brooded. Nest built by both sexes, a bulky globular structure of grass and plant fibres, upward-directed tunnel entrance in one side, leading into central chamber lined with down and feathers, nest of race *humilis* more highly domed; usually 1·5–10 m above ground in cactus or thorn bush, occasionally in artificial site such as roof eaves, or in pendent nest (relined) of species such as Spot-breasted Oriole (*Icterus pectoralis*); in Costa Rica and doubtless other areas, deliberately sites nest in acacia (*Acacia*) harbouring symbiotic aggressive stinging ants (e.g. of genus *Pseudomyrmex*), choosing tree with the most hostile ants, also frequently close to wasp nest and thereby gaining vicarious protection against nest-predatory monkeys; numerous nests for roosting built throughout year. Clutch size 3–6 (usually 4–5) in El Salvador, usually 4 in Costa Rica, eggs white or buffy white with speckles or blotches of brown, lilac or blackish; no information on incubation and fledging periods; young may be fed by helpers other than parents, presumably related birds.
Movements. Apparently entirely sedentary.
Status and Conservation. Not globally threatened. Common or abundant in many parts of its range. Appears able to tolerate substantial habitat modification, provided sufficient bushes and cacti are left.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Binford (1989), Blake (1953), Dearborn (1907), Dickey & van Rossem (1938), Flaspohler & Laska (1994), Hellmayr (1934), Howell & Webb (1995), Hutto (1992), Joyce (1990, 1993), Komar & Domínguez (2001), Land (1970), Lowery & Dalquest (1951), Monroe (1968), Rowley (1966), Selander (1964), Slud (1964, 1980), Stiles & Skutch (1989), Young *et al.* (1990).

8. Thrush-like Wren

Campylorhynchus turdinus

French: Troglodyte grivelé **German**: Drosselzaunkönig **Spanish**: Cucarachero Turdino
Other common names: Thrush-like Cactus-wren; Plain-breasted Wren (*unicolor*)

Taxonomy. *Opetiorhynchus turdinus* Wied, 1821, Rio Catolé, Bahia, Brazil.
Sometimes considered conspecific with *C. albobrunneus*, but has totally different vocalizations. Proposed race *aenigmaticus* (from SW Colombia) of latter sometimes included with present species; probably a hybrid form. Three subspecies normally recognized.
Subspecies and Distribution.
C. t. hypostictus Gould, 1855 – SE Colombia and E Ecuador E across Brazil to R Tocantins, S to E Peru and N Bolivia.
C. t. unicolor Lafresnaye, 1846 – lowlands of E Bolivia and adjacent Brazil, N & C Paraguay and extreme N Argentina (E Formosa).
C. t. turdinus (Wied, 1821) – E Brazil (Maranhão, and Bahia S to Espírito Santo).



Descriptive notes. 20·5 cm; 39 g. Nominate has supercilium and lores whitish or pale greyish, ear-coverts mottled grey-brown; crown dull-scalloped blackish-grey, shoulders and back similar with broader scalloping; lower back and rump blackish-grey, obscurely barred buffy grey; primaries and secondaries barred dull blackish and brown, rectrices dull blackish-brown; chin, throat and chest dull white, chest with conspicuous blackish spots; flanks buffish-grey with diffuse darker bars; eye pale orange-rufous; bill blackish above, ivory below; legs dusky grey. Sexes similar. Juvenile duller, spots on chest reduced and less well marked. Race *hypostictus* similar to nominate, but more heavily and extensively spotted below; *unicolor* is very different, underparts with few or no spots, upperparts grey with little brown tinge, supercilium more obvious. Voice. Song a loud, cheerful chortling, often prefaced by a series of harsh scratchy notes; both sexes sing.
Habitat. Humid forest, including *várzea* and second growth at forest edge, also gardens and parks; often near pasture. Also in palm trees in Brazil (Mato Grosso). Lowlands down to sea-level, locally to 1300 m in E Andean foothills.
Food and Feeding. Mostly insectivorous, but also takes fruit. Forages usually in small groups, presumably family parties, mostly in upper parts of trees.
Breeding. Little known. Season at least Jun–Oct in E Bolivia. Nest in Bolivia described as a ragged grassy ball, often containing other material such as snakeskin, scraps of plastic etc., 21 cm high, 13–16 cm wide, with entrance hole 4 cm in diameter located 4 cm down from top, usually located in totai palm (*Acrocomia aculeata*) or in top of evergreen tree, especially horori (*Swartzia horori*), also frequently in artificial site such as roof; nest in E Brazil described as domed, oval in shape, with outside antechamber and inner breeding chamber, situated in tree; in the Mato Grosso (race *unicolor*) may use old nest of thornbird (*Phacellodomus*), stuffing the cavity with feathers; in Peru, has been seen to enter natural cavity in dead tree which probably contained a nest. Eggs 3–4, off-white with darker spots and blotches, especially at blunt end; no information on incubation and fledging periods. Nests sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*) in Bolivia.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in some parts of range. Seems to adapt well to forest edge, roadsides and similar habitats. Presently expanding range into N Argentina.
Bibliography. Best *et al.* (1997), Canevari *et al.* (1991), Chapman (1917), Contreras & Andres (1986), Contreras *et al.* (1992), Davis (1993), Guerrero & Arambiza (2001), Hayes (1995), Hellmayr (1934), Hennessey *et al.* (2003), Hilty & Brown (1986), Maillard & Lindo (1998), Meyer de Schauensee (1982), Parker & Goerck (1997), Peres & Whittaker (1991), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Robinson & Terborgh (1997), Selander (1964), Short & Morony (1969), Sick (1993, 1997), Zimmer *et al.* (1997).



PLATE 36

inches 4

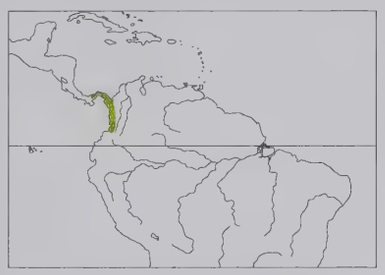
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9. **White-headed Wren**

Campylorhynchus albobrunneus

French: Troglodyte à tête blanche **Spanish**: Cucarachero Cabeciblanco
German: Weißkopf-Zaunkönig
Other common names: White-headed Cactus-wren

Taxonomy. *Heleodytes albo-brunneus* Lawrence, 1862, Panama Railroad, near summit of Atlantic slope, Panama.
Has been thought to form a superspecies with *C. nuchalis*, *C. fasciatus* and *C. zonatus*. Sometimes treated as conspecific with last, with which may hybridize in S Colombia; proposed race *aenigmaticus* (from Nariño, in SW Colombia) may be a hybrid between the two. Has also been treated as conspecific with *C. turdinus*, but differs distinctly in vocalizations. Two subspecies recognized.
Subspecies and Distribution.
C. a. albobrunneus (Lawrence, 1862) – Panama, from Canal Zone E to W Darién.
C. a. harterti (Berlepsch, 1907) – E Panama (E Darién) and Pacific slope of Colombia (S to Valle).



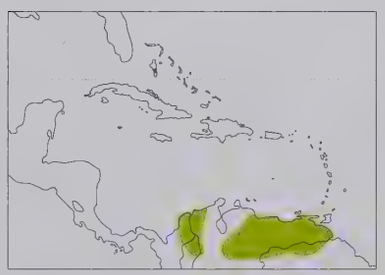
Descriptive notes. 18·5 cm; 27·5–39 g. Uniquely plumaged wren. Has entire head, nape, throat, chest and most of belly immaculate white (though head frequently stained brown), shoulders, back, rump and uppertail-coverts uniform dull blackish-brown, sometimes a few white feathers on shoulders; primaries and secondaries dull brownish-black; tail dark brown, very inconspicuous fine dark bars on upper surface; thighs and vent diffuse grey-brown; eye dark red; bill dark brown or greyish-brown above, pale horn below; legs lead-grey. Sexes similar. Juvenile has streaky grey-brown crown, diffuse pale speckles on shoulders, buffy face and underparts, buff-cinnamon belly, grey eyes. Race *harterti* has darker upperparts than nominate. VOICE. Song a series of harsh scratchy notes; both sexes sing. Call a harsh "kahk".
Habitat. Humid forest with epiphytes, including somewhat disturbed forest; sea-level to 1500 m.
Food and Feeding. Few detailed data. Stomach contents from Panama include beetles (Coleoptera), orthopterans, ants (Hymenoptera). Forages often in small groups, probably extended family parties, mostly at middle or upper levels of trees; frequently searches among epiphytes.
Breeding. Very poorly known. Few nests described, a globular structure with side entrance, in epiphytes in low tree. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Generally rather uncommon over most of its range; perhaps more abundant in Darién region of Panama. Occurs in Darién National Park.
Bibliography. Angehr (2003), Anon. (1998b), Chapman (1917), Cracraft (1985), Farley (1955), Haffer (1967, 1975), Hellmayr (1934), Hilty (1997), Hilty & Brown (1986), Meyer de Schauensee (1982), Minzenmayer *et al.* (1995), Ridgely & Gwynne (1989), Ridgway (1904), Robbins *et al.* (1985), Wetmore *et al.* (1984), Willis & Eisenmann (1979).

10. **Stripe-backed Wren**

Campylorhynchus nuchalis

French: Troglodyte rayé **German**: Pantherzaunkönig **Spanish**: Cucarachero Chocorocoy
Other common names: Stripe-backed Cactus-wren, Banded Wren

Taxonomy. *Campylorhynchus nuchalis* Cabanis, 1847, Cumaná, Sucre, Venezuela.
Has been thought to form a superspecies with *C. albobrunneus*, *C. fasciatus* and *C. zonatus*. Three subspecies recognized.
Subspecies and Distribution.
C. n. pardus P. L. Sclater, 1858 – Caribbean coast of Colombia (Magdalena and Bolívar S to c. 8° N).
C. n. brevipennis Lawrence, 1866 – N Venezuela (Yaracuy E to Miranda, S to Guárico).
C. n. nuchalis Cabanis, 1847 – C & E Venezuela (Barinas E to W Sucre and Delta Amacuro, S to Apure and N Bolívar).



Descriptive notes. 17·5 cm; 21·1–25·5 g. Nominate race has buff-grey crown mottled with blackish, hindneck with brownsih or buffy tinge, nape and upperparts conspicuously streaked black and white, primaries and secondaries heavily barred dull black and white, tail strongly barred dull black and white; whitish below, diffuse greyish spots on lower throat, becoming larger and darker on chest and belly; lower flanks diffusely barred blackish; eye white or straw-yellow; bill blackish above, greyish or whitish-flesh below; legs slate-grey. Sexes similar. Juvenile has solid blackish crown, more brownish-black colour on upperparts, wings and tail, reduced markings on underparts, grey iris. Race *pardus* differs from nominate in having less spotting on underparts, heavier bill; *brevipennis* has darker crown than nominate, heavier spotting below. VOICE. Song an unmusical series of 6 or more scratchy notes, given by both sexes and by members of group; partners, sitting close to each other, utter alternating or intercalating phrases with precise timing; up to five group-members may chorus together. Calls harsh and raspy; male learns repertoire of stereotyped calls from older male relatives, vocalizations thus specific to a patrilineal family group, and may also be shared by related males which have moved to other groups; individuals able to recognize this relationship not only within own group, but also for related males in other groups.
Habitat. Dry and semi-humid habitats; open forest, bushland and gallery forest; frequently near small waterbodies. Sea-level to 800 m. Normally not found alongside *C. griseus*.
Food and Feeding. Predominantly invertebrates. Forages at all levels, including on tree trunks.
Breeding. Season Apr–Sept, egg-laying triggered by first heavy rains of wet season; two or three broods, but multiple broods successful only for larger groups. Communal nesting system and social organization the most highly developed within family; group consists of dominant (nesting) pair and up to 12 helpers, mostly offspring produced by dominant pair; all young females and majority of young males ultimately disperse to other territories, such males as remain rise in rank with time and may attain breeding status; loose colony formed by many groups in single area, much competition for vacancies in adjacent groups (especially large ones). Nest a large, untidy domed structure made of grass, fibres and similar material, lined with feathers, placed 2–10 m above ground usually in leguminous tree or palm, frequently near end of slim branches for protection against monkeys; alternatively, abandoned pendent nest of other species, e.g. Rufous-fronted Thornbird (*Phacellodomus rufifrons*), relined with feathers and then used. Eggs usually 4, plain white; incubation by dominant female alone, period 18–21 days; all group-members participate in feeding of young and defence of nest and territory; fledging period probably c. 19 days. Nests not uncommonly parasitized by Shiny Cowbird (*Molothrus bonariensis*). Strong correlation between breeding success and numbers of helpers.
Movements. Apparently sedentary. Dispersal by young birds over short range.
Status and Conservation. Not globally threatened. Uncommon to locally common; abundant in some areas. In prime habitat, group territories (each containing 5–14 individuals) from 1 ha to 4 ha in size and may be contiguous. Occurs in Isla de Salamanca National Park, in Colombia.
Bibliography. Barnés (1939), Brenowitz & Kroodsma (1996), Chapman (1917), Cherrie (1916), Cracraft (1985), Darlington (1931), Friedmann (1948), Friedmann & Smith (1950), Hellmayr (1934), Hilty & Brown (1986), Meyer de Schauensee (1982), Piper (1994), Piper & Slater (1993), Price (1999, 2003), Rabenold, K.N. (1984, 1985, 1990), Rabenold, K.N. & Carla (1979), Rabenold, K.N. & Yaber (1998), Rabenold, P.P., Kerry *et al.* (1991), Rabenold, P.P., Rabenold & Michella (1988), Ridgely & Tudor (1989), Selander (1964), Stevens (1989), Stevens & Wiley (1995), Thomas (1979), Wetmore (1939), Wiley & Wiley (1977), Yaber & Rabenold (1998, 2002), Zack (1991), Zack & Rabenold (1989).

11. **Fasciated Wren**

Campylorhynchus fasciatus

French: Troglodyte fascié **German**: Bindenzaunkönig **Spanish**: Cucarachero Ondeado
Other common names: Fasciated Cactus-wren

Taxonomy. *Furnarius fasciatus* Swainson, 1838, Peru.
Has been thought to form a superspecies with *C. albobrunneus*, *C. nuchalis* and *C. zonatus*. Two subspecies recognized.
Subspecies and Distribution.
C. f. pallescens Lafresnaye, 1846 – SW & S Ecuador (S from Guayas, including Puna I) S to N Peru (Tumbes, N Piura).
C. f. fasciatus (Swainson, 1838) – arid coastal regions of Peru from Piura S to NW Lima, probably also E of R Marañón (Amazonas S to Huánuco).



Descriptive notes. 19 cm; one female 24·9 g. Nominate race has greyish-white supercilium, black-speckled grey crown; blackish-grey shoulders, back and rump, shoulders speckled whitish, rump barred whitish; primaries, secondaries and upperwing-coverts heavily barred blackish and off-white; tail blackish-brown with prominent off-white bars; chin off-white with darker streaks, chest and belly whitish with heavy blackish-grey spots, flanks barred blackish-grey; eye red-brown to pale whitish-tan; bill dark grey or dark brown above, greyish-horn below; legs dark tan or dull yellowish. Sexes similar. Juvenile has markings on underparts less well defined, slate-grey eyes. Race *pallescens* is paler, less well marked below and shorter-billed than nominate. VOICE. Song a series of harsh churring notes interspersed with gurgling notes; duetting or group singer. Call a harsh "churr".
Habitat. Arid and semi-arid areas; thorny scrubland, including areas much modified by human activity; also citrus orchards. In Ecuador in more humid habitat, including deciduous woodland. Sea-level to 1500 m, rarely to 2500 m.
Food and Feeding. Predominantly invertebrates; some vegetable matter. Forages in groups, in bushes and shrubs, also on roofs of farm buildings; occasionally descends to ground.
Breeding. Season May–Aug. Usually co-operative nester, more rarely as solitary pair; groups of up to ten individuals, with one dominant nesting pair, offspring tend to remain in territory in following year and to assist at nest, after which females disperse, but many males remain with group and gradually attain senior and, ultimately, breeding status. Nest domed, with side entrance, built of grass and lined with feathers, in variety of sites, including citrus and mesquite (*Prosopis*) trees and columnar cactus, and once on porch in a house; old mud-oven nest of Pale-legged Hornero (*Furnarius leucopus*) frequently used. Eggs probably 3–4, undescribed; incubation c. 17 days; no information on fledging period; birds roost communally in nest.
Movements. Sedentary; local dispersal by young females.
Status and Conservation. Not globally threatened. Common in parts of range. Seems to adapt well to highly modified habitat, provided that sufficient bushes are left. Status in Peru E of R Marañón requires clarification; possibly extends S into Junín.
Bibliography. Becker & López (1997), Best *et al.* (1997), Bloch *et al.* (1991), Butler (1979), Hellmayr (1934), López & Gastezzi (2000), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Taczanowski (1884), Wiedenfeld *et al.* (1985), Williams & Tobias (1994).

12. **Band-backed Wren**

Campylorhynchus zonatus

French: Troglodyte zoné **German**: Tigerzaunkönig **Spanish**: Cucarachero Barrado
Other common names: Band-backed/Banded Cactus-wren, Barred Wren/Cactus-wren

Taxonomy. *Picolaptes zonatus* Lesson, 1832, "California"; error = Orizaba, Veracruz, Mexico.

On following pages: 13. Grey-barred Wren (*Campylorhynchus megalopterus*); 14. Tooth-billed Wren (*Odontorchilus cinereus*); 15. Grey-mantled Wren (*Odontorchilus branickii*); 16. American Rock Wren (*Salpinctes obsoletus*); 17. Canyon Wren (*Catherpes mexicanus*).

Has been thought to form a superspecies with *C. albobrunneus*, *C. nuchalis* and *C. fasciatus*. Sometimes considered conspecific with first of those, and may hybridize with it in S Colombia; proposed race *aenigmaticus* (from Nariño, in SW Colombia) is possibly a hybrid between them. Believed by some to be possibly closely related also to *C. megalopterus*; ranges overlap but no evidence of interbreeding. Proposed race *panamensis* (described from WC Panama) very similar to, and intergrading with, *costaricensis*, considered better merged with latter. Seven subspecies recognized.

Subspecies and Distribution.

C. z. zonatus (Lesson, 1832) – E Mexico (Puebla, Veracruz).

C. z. restrictus (Nelson, 1901) – S Mexico (S Veracruz, N Oaxaca) S to Guatemala and Belize.

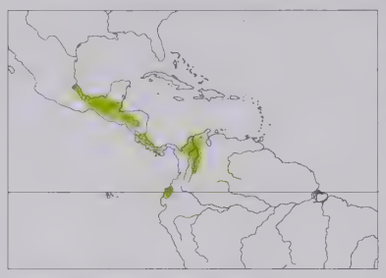
C. z. vulcanius (Brodkorb, 1940) – S Mexico (Chiapas) S to Nicaragua.

C. z. costaricensis Berlepsch, 1888 – Caribbean slope of Costa Rica S to WC Panama.

C. z. curvirostris Ridgway, 1888 – Santa Marta region of N Colombia.

C. z. brevirostris Lafresnaye, 1845 – N Colombia (except Santa Marta) to NW Ecuador.

C. z. imparilis Borrero & Hernández, 1958 – NE Colombian lowlands.



Descriptive notes. 18–19 cm; 28·3–39·5 g. Distinctive wren with heavily spotted chest, bright cinnamon belly and prominently barred back. Nominate race has crown speckled blackish-grey, nape streaked black and white, back heavily barred black and off-white sometimes with chestnut areas, primaries and secondaries barred black and whitish, tail dull black with off-white bars, especially at side; throat and chest buff-white with circular black spots, belly orange-buff; eye reddish-brown; bill blackish above, paler below; legs yellowish-flesh or yellowish-olive. Sexes similar. Juvenile has blackish crown (capped appearance), back spotted, not barred, greyish chest without spots, pale cinnamon-buff belly. Race *restrictus* is larger and more heavily spotted than nominate; *vulcanius* is less strongly buff, no spots or bars on belly; *costaricensis* is smaller than nominate, with abdomen more tawny, heavier and blacker spotting on chest and throat; *brevirostris* has belly much paler than nominate, juvenile generally paler; *curvirostris* is very similar to previous but smaller, with posterior upperparts deeper buff; *imparilis* differs from last in shorter tail, much less deeply coloured lower underparts. Voice. Song a jumbled series of harsh scratchy notes, usually in phrases of c. 2–3 seconds with frequent repetition; sexes sing in unison. Calls loud and harsh, e.g. "zhek-zhek, karrr".

Habitat. Very varied. Lowland humid forest, forest edge and disturbed areas; at higher altitudes, both in dry oak (*Quercus*) and pine (*Pinus*) forest and in wet epiphytic forest, also edge of cypress (*Cupressus*) forest. Sea-level to 3000 m.

Food and Feeding. Food appears to be mostly invertebrates. Forages at all levels; prises apart loose tree bark and lichens, sometimes while hanging head downwards in manner of tit (Paridae); also forages on ground, by turning over leaves. Sometimes joins mixed-species flocks.

Breeding. Egg-laying Mar–Aug; double-brooded in lowlands, one brood at higher altitudes. Co-operative breeder. Nest, built by male or by both members of pair, an untidy globular structure c. 25–30 cm in diameter, of plant fibres, straw and moss, lined with wool and hair, lateral entrance c. 10 cm across and protected above by short "porch"; placed 2–30 m up, usually 8 m or more, in tree or under cover of epiphytes; nests also built for roosting purposes, often by several (presumably related) individuals. Eggs 3–5, white, with or without a few dark speckles; incubation period probably c. 20 days; chicks fed by both sexes, also by up to five helpers (presumably immature relatives), fledging period 18–19 days; after fledging, family roosts communally, usually in different nest.

Movements. Sedentary; no evidence of even altitudinal movement.

Status and Conservation. Not globally threatened. Common or abundant in much of its range. Occurs in rather broad range of habitats; seems able to tolerate substantial modification of habitat.

Bibliography. Anon. (1998b), Best *et al.* (1997), Binford (1989), Blake (1953), Bloch *et al.* (1991), Brodkorb (1943), Chapman (1917), Cracraft (1985), González-García (1993), Haffer (1975), Hellmayr (1934), Hilty & Brown (1986), Howell & Webb (1995), Land (1970), Lee Jones (2004), Lowery & Dalquest (1951), Meyer de Schauensee (1982), Miller (1995), Monroe (1968), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Ridgway (1904), Selander (1964), Skutch (1940, 1960, 1985b), Slud (1960, 1964), Stiles & Skutch (1989), Thurber *et al.* (1987), Wetmore (1941, 1943).

13. **Grey-barred Wren**

Campylorhynchus megalopterus

French: Troglodyte zébré **German**: Graubinden-Zaunkönig **Spanish**: Cucarachero Serrano
Other common names: Grey-barred Cactus-wren, Grey Wren(!)/Cactus-wren

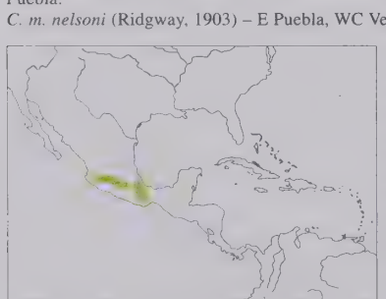
Taxonomy. *Campylorhynchus megalopterus* Lafresnaye, 1845, Mexico.

Suggested as being closely related to *C. zonatus*, but ranges overlap and no evidence of interbreeding. Race *nelsoni* has been suggested as possibly a separate species. Two subspecies recognized.

Subspecies and Distribution.

C. m. megalopterus Lafresnaye, 1845 – highlands of C Mexico from Jalisco and Michoacán E to W Puebla.

C. m. nelsoni (Ridgway, 1903) – E Puebla, WC Veracruz and N Oaxaca (S Mexico).



Descriptive notes. 17–19·5 cm; 32·8–33·5 g. Large greyish wren with prominent spotting and barring. Nominate race has crown greyish with black feather centres, shoulders and back black, nape with whitish streaks, back prominently barred white; remiges and rectrices barred blackish and off-white; throat and chest whitish with conspicuous black spots, flanks buffy with diffuse blackish bars; eye reddish-brown; bill blackish above, largely grey-black below; legs brownish-flesh. Sexes similar. Juvenile is quite distinct, plumage overall much more buff and brownish, with solid brownish cap, no prominent barring on back, no spots on chest. Race *nelsoni* is smaller than nominate, underpart markings greyish-brown, rather than black. Voice. Song a rapid harsh chatter; both sexes sing in duet. Call a harsh "karrr".

Habitat. Montane forest of various types, including humid pine–oak (*Pinus–Quercus*) forest and epiphytic forest; also pure stands of tall fir (*Abies*) in Michoacán. Occurs in both virgin habitat and areas that have been substantially cut over. At 2100–3150 m.

Food and Feeding. No published information on diet; probably mostly invertebrates. Has finer bill than other members of genus, perhaps indicating that smaller prey taken. Spends most of its time in probing among epiphytes, mosses and lichens, and in pine cones; appears not to forage on the ground.

Breeding. Poorly known. Season probably May–Jun. Few nests described, a domed structure of mosses, entrance hole at side, situated 15–20 m up in oak, conifer or madrono (*Arbutus*) tree. Eggs undescribed; no information on incubation and fledging periods; breeding birds assisted by helpers at nest.

Movements. Apparently entirely sedentary.

Status and Conservation. Not globally threatened. Restricted-range species: present in Sierra Madre Occidental and Trans-Mexican Range EBA and Southern Sierra Madre Oriental EBA. Quite common in many areas of suitable habitat. Appears to be able to tolerate some modification of habitat.

Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Binford (1989), Blake (1953), Brodkorb (1947), Edwards & Martin (1955), Elliott & Davis (1965), Hellmayr (1934), Howell & Webb (1995), Hutto (1980), Lea & Edwards (1950), Ridgway (1904), Rowley (1984), Selander (1964), Wheatley & Brewer (2001).

Genus *ODONTORCHILUS* Richmond, 1915

14. **Tooth-billed Wren**

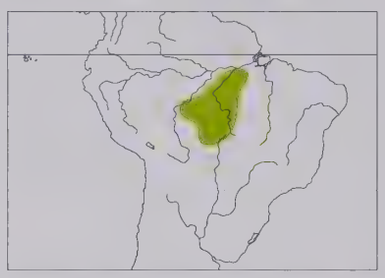
Odontorchilus cinereus

French: Troglodyte denté **German**: Zahnschnabel-Zaunkönig **Spanish**: Cucarachero Dentado

Taxonomy. *Odontorhynchus cinereus* Pelzeln, 1868, Salto do Girão, upper River Madeira, Brazil.

Sometimes regarded as conspecific with *O. branickii*, but the two differ significantly in song and habitat. Monotypic.

Distribution. C Brazil (from just S of Amazon, in E Amazonas and Pará, S to E Rondônia and C Mato Grosso) and E Bolivia (NE Santa Cruz).



Descriptive notes. 12 cm; male 11 g. Crown is cinnamon grey-brown, back and shoulders medium grey, primaries and secondaries rather darker; rectrices grey-brown with about six broad greyish-black bars, outermost rectrices with pale tips; ear-coverts grey-brown, throat and chest buffy-grey, flanks greyish-white, undertail-coverts greyish-white with blackish-grey bars; eye dark brown to brick-red; bill black, grey base of lower mandible; legs dark grey. Sexes similar. Juvenile has base of lower mandible brownish. Voice. Song a loud series of notes on same pitch, slower and less trilled than that of *O. branickii*. Call a high-pitched "swee".

Habitat. Tropical lowland forest, from near sea-level to 500 m.

Food and Feeding. No dietary information recorded; probably mostly invertebrates. Feeds in upper canopy of forest, frequently in mixed flocks with tyrant-flycatchers (Tyrannidae), tanagers (Thraupidae) and furnariids.

Breeding. One female in Bolivia in breeding condition on 1st Sept. No other information.

Movements. No information; probably sedentary.

Status and Conservation. Not globally threatened. Relatively sparse over most of its range; fairly common in parts of E Bolivia. Occurs in Rio Cristalino Forest Reserve, in Brazil. Susceptible to deforestation in substantial parts of its range.

Bibliography. Acheson & Davis (2001), Bates *et al.* (1992), Cracraft (1985), Dubs (1992), Forrester (1993), Hellmayr (1934), Hennessey *et al.* (2003), Meyer de Schauensee (1982), Ridgely & Tudor (1989), Sick (1993, 1997), Stotz *et al.* (1997).

15. **Grey-mantled Wren**

Odontorchilus branickii

French: Troglodyte de Branicki **Spanish**: Cucarachero Dorsigrís
German: Graumantel-Zaunkönig

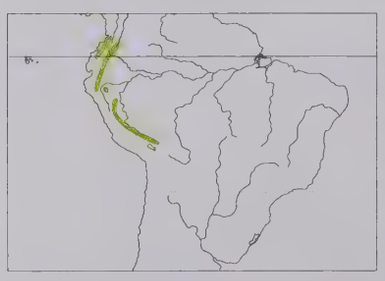
Taxonomy. *Odontorhynchus branickii* Taczanowski and Berlepsch, 1885, Machay, Tungurahua, east Ecuador.

Sometimes regarded as conspecific with *O. cinereus*, but the two differ significantly in song and habitat. Two subspecies recognized.

Subspecies and Distribution.

O. b. minor (Hartert, 1900) – W Andes of S Colombia and extreme N Ecuador.

O. b. branickii (Taczanowski & Berlepsch, 1885) – E Andes of S Colombia (S from W Caqueta) and E Ecuador S on both slopes to W Bolivia.



Descriptive notes. 12 cm; 9–10·2 g. Nominate race has obscure greyish to whitish supercilium, grey-brown ear-coverts streaked greyish-white; brown crown, mid-grey shoulders and back merging into brownish on rump; primaries and secondaries somewhat darker grey than back; tail medium grey with prominent dark bars, outer rectrices with subterminal white bar (visible from below); below, whitish with slight buffy tinge, undertail-coverts strongly barred black; eye brown; bill black above, silver-grey below; legs grey. Sexes similar. Juvenile is more buffy below, brown on forehead duller. Race *minor* is smaller than nominate, with barring on central rectrices vestigial. Voice. Song a high metallic trill on even pitch, faster and more distinctly trilled than that of *O. cinereus*; resembles songs of some North

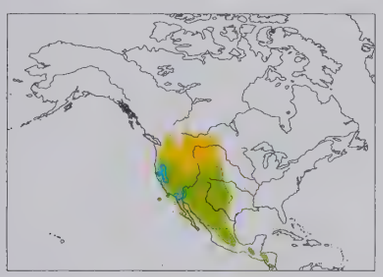
American parulid warblers more than those of any other wren. Callis a high "si-si-si", also atypical for a wren.
Habitat. Humid subtropical and upper tropical forest. Mostly 1400–2200 m, occasionally higher; 800–1100 m on Pacific slope.
Food and Feeding. Few data; stomach contents of specimens contained only invertebrates. Forages high in canopy of forest, solitarily or, frequently, in mixed flocks that include e.g. tanagers (Thraupidae) and becards (*Pachyramphus*).
Breeding. No information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Generally uncommon. Has presumably declined, as parts of its former range are now significantly deforested. Occurs in Podocarpus National Park, in Ecuador.
Bibliography. Best *et al.* (1997), Bloch *et al.* (1991), Chapman (1917), Davies *et al.* (1994), Hellmayr (1934), Hennessey (2004), Hennessey *et al.* (2003), Hilty (1997), Hilty & Brown (1986), Hornbuckle (1999a), Meyer de Schauensee (1982), Perry *et al.* (1997), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Walker (2001).

Genus *SALPINCTES* Cabanis, 1847

16. American Rock Wren
Salpinctes obsoletus

French: Troglodyte des rochers **German**: Felsenzaunkönig **Spanish**: Cucarachero Roquero
Other common names: Rock Wren(!)

Taxonomy. *Troglodytes obsoleta* Say, 1823, South Platte River, Colorado, USA.
Probably closest to *Catherpes* and *Hylorchilus*. Two proposed island races, *pulverius* (from San Nicolas I and San Clemente I, off SW California) and *proximus* (from San Martín I, off NW Baja California), both considered indistinguishable from nominate; described races *costaricensis* (NW Costa Rica) and *fasciatus* (NW Nicaragua) merged with *guttatus*, but one or both possibly merit recognition. Race *exsul*, from San Benedicto I (off WC Mexico), extinct. Five extant subspecies recognized.
Subspecies and Distribution.
S. o. obsoletus (Say, 1823) – breeds W North America from S British Columbia, S Alberta and S Saskatchewan S to coastal California (including islands of San Nicolas and San Clemente), Oklahoma and W Texas, and W, N & C Mexico from Baja California (including San Martín I) S at higher elevations to Oaxaca; N populations migrate to S parts of range.
S. o. guadeloupensis Ridgway, 1876 – Guadalupe I, off W Baja California.
S. o. tenuirostris van Rossem, 1943 – San Benito, off W Baja California.
S. o. neglectus Nelson, 1897 – highlands from S Mexico (Chiapas) S to C Honduras.
S. o. guttatus Salvin & Godman, 1891 – El Salvador S to NW Costa Rica.



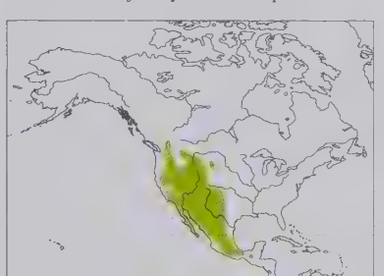
Descriptive notes. 14–16 cm; 16·5 g. Nominate race has grey-buff supercilium, greyish-brown crown, nape and back with numerous dark streaks tipped white; mid-back, shoulders and greater upperwing-coverts with obscure darker bars; rump rufous-brown; primaries and secondaries brown with darker bars; rectrices buffy brown with prominent blackish-brown bars and buff tips, widest on outermost rectrices; dull whitish below, belly rufous-buff, chest with fine dark streaks; eyes brown; upper mandible dark horn with pale base, lower mandible pale greyish-pink; legs blackish-brown. Sexes similar. Juvenile is duller, with obscure barring on back, paler underparts. Race *guadeloupensis* is darker and has heavier bill than nominate; *tenuirostris* differs only in having longer, slimmer bill; *neglectus* is darker, greyer and more heavily marked than nominate; *guttatus* is very distinct, much more blotched and barred above and below. Voice. Male repertoire of c. 100 different songs, each a series of identical, repeated syllables, successive songs usually different, as e.g. "kerée kerée kerée", "chair chair chair chair", "deedle deedle deedle deedle", "tur tur tur tur", "kerée kerée kerée trrrrrrr"; female does not sing. Calls short and buzzy, e.g. "chick-urr".
Habitat. Barren rocky hillsides, screes and boulderfalls, also quarries and recently clear-cut areas in rocky terrain. Vagrants frequently on artificial structures, such as breakwaters, which resemble its natural habitat. Sea-level to 3000 m; 1000–3500 m in S of range.
Food and Feeding. Mostly invertebrates; small lizards also taken. Forages among boulders and rocks; very active. Insular race *guadeloupensis* frequents slaughterhouses, where gleans insects from offal.
Breeding. Season from late May in N and at higher elevations; earlier in S, e.g. from mid-Jan in NW Mexico (Baja California) and from early Feb in S USA (California); three broods in S populations, usually two farther N. Nest a cup of grasses and fibres, lined with feathers and fur, usually with foundation of pebbles or small flat stones; foundation, function of which obscure, sometimes quite massive (one weighed 2·2 kg in total, c. 120 times weight of adult bird, with some individual stones up to one third of bird's own weight); usually in crevice in rock-pile or in abandoned hole of gopher (Geomyidae), occasionally in artificial site in abandoned building. Clutch in N of range usually 5–6 eggs, occasionally 4–8, rarely as many as 10, on Guadalupe (race *guadeloupensis*) usually 4, sometimes 5, eggs glossy white with sparse reddish-brown speckles; incubation by female alone, period 12–14 days; fledging period 14–16 days.
Movements. S populations and those on islands apparently sedentary. Migratory in N; withdraws in winter from all of breeding range N of N California, C Nevada, C Arizona, C New Mexico and N Texas. Recorded as vagrant over most of E North America, as far E as Newfoundland, New Jersey and Florida, mostly during Oct–Dec; records also from farther N in Canada, including NW Territories (Mackenzie) and on S shore of Hudson Bay.
Status and Conservation. Not globally threatened. Common in suitable areas over much of its range. Has bred in NC Canada, at Churchill (N Manitoba). Race *exsul*, formerly resident on San Benedicto, in Revillagigedo Group, off W Mexico, became extinct in 1952 following a volcanic eruption. No recent information on status of other two island races (*guadeloupensis* and *tenuirostris*). There is little human pressure on much of its preferred barren habitat, often in rather remote areas.
Bibliography. Anon. (1998b), Baicich & Harrison (1997), Barker (1999), Bond (1940), Brattstrom (1990), Brattstrom & Howell (1956), Bryant (1887), Campbell *et al.* (1997), Ceballos & Valdelamar (2000), Contreras (1997), Contreras & Trevino (1987), DeGraaf & Rappole (1995), Dickey & van Rossem (1938), Gómez de Silva (1995), Grinnell (1928a), Hellmayr (1934), Howell & Webb (1995), Johnsgard (1979), Jones, S.L. (1998), Knowlton & Harmston (1942a), Kroodsma (1975), Lowther *et al.* (2000), Matiasek (1998a, 1998b), Merola (1995), Minzenmayer *et al.* (1995), Monroe (1968), Nice (1931), Oberbauer *et al.* (1989), Oppenheimer (2004), Oppenheimer & Morton (2000), Peabody (1907), Phillips & Sanborn (1995), Price *et al.* (1995), Ray (1904), Renaud (1979), Ridgway (1876, 1904), Root (1988), Seutin & Bonnier (1989), Slud (1964), Small (1994), Smith (1904), Smyth & Bartholomew (1966), Stiles & Skutch (1989), Thurber *et al.* (1987), Tramontano (1964), Udvardy (1963), Walsh & Bock (1997), Wolf *et al.* (1985).

Genus *CATHERPES* S. F. Baird, 1858

17. Canyon Wren
Catherpes mexicanus

French: Troglodyte des canyons **Spanish**: Cucarachero Barranquero
German: Schluchtenzaunkönig

Taxonomy. *Thryothorus mexicanus* Swainson, 1829, Real del Monte, Hidalgo, Mexico.
Probably closest to *Hylorchilus*. Other described races, all from USA, are *griseus* (Yakima County, in S Washington), *punctulatus* (Placer County, in EC California) and *polioptilus* (Chisos Mts, in Texas), but plumage variations of these are not constant, and no clear-cut geographical boundaries are apparent. Seven subspecies recognized.
Subspecies and Distribution.
C. m. pallidior A. R. Phillips, 1986 – SW Canada (S British Columbia) and W USA (S to NE Utah and NW Colorado).
C. m. conspersus Ridgway, 1873 – SW USA (from N Nevada and C Colorado) S to NW Mexico (S to C Baja California).
C. m. albifrons (Giraud, 1841) – S USA (SW Texas) and N Mexico (Coahuila, Nuevo León).
C. m. meliphonus Oberholser,1930 – NW Mexico (W Sonora and WC Chihuahua S to Sinaloa and Durango).
C. m. croizati A. R. Phillips, 1986 – S Baja California.
C. m. cantator A. R. Phillips, 1966 – C Mexico (Nayarit S to Michoacán).
C. m. mexicanus (Swainson,1829) – Mexican plateau from Durango and Jalisco S to Colima and Oaxaca, also disjunctly in SW Chiapas.



Descriptive notes. 13–15 cm; 9–18 g. Nominate race has crown and nape grey-brown with whitish speckles, shoulders and back rufous-brown with brown and whitish spots, rump chestnut; remiges chestnut-brown with darker bars, rectrices chestnut-brown with blackish transverse bars; ear-coverts grey-brown, finely spotted with white; chin to chest greyish-white, contrasting chestnut-brown belly richer towards crissum and variably marked black and white; eyes dark brown; bill notably long and decurved, greyish-brown, lower mandible with pale base; legs dull grey-black. Sexes similar. Juvenile is less brightly coloured, speckles on back obscure. Race *pallidior* is paler than nominate, especially on crown; *conspersus* is smaller and paler, with shorter bill; *albifrons* is darker and larger than other races; *meliphonus* is smaller and generally lighter in colour than nominate; *croizati* is also smaller and paler, but with warmer reddish-brown underparts; *cantator* is dark, resembles nominate but smaller. Voice. Song a beautiful descending trill, slowing towards end, terminating with superb series of clear whistles; both sexes sing, female's song usually shorter and with buzzy overtone. Call a loud metallic buzz.
Habitat. Confined to areas with rock faces, such as canyons, more rarely sea cliffs, also ruins; nearby vegetation can be coniferous or deciduous, or mixed. Occurs in arid areas in SW USA and humid areas in S Mexico. Sea-level to 3000 m in Mexico, usually to 1850 m in W USA.
Food and Feeding. Food entirely invertebrates, especially spiders (Araneae), beetles (Coleoptera), bugs (Hemiptera), ants (Hymenoptera) and termites (Isoptera). Forages in narrow crevices in rocks, for which morphologically adapted (long decurved bill, flattened cranium, short tarsi). Has been observed to pilfer paralysed spiders from nests of mud-dauber wasp (*Scelifron cementarium*).
Breeding. From Mar in S, but from as late as Jun in N and at high altitudes; sometimes two broods, rarely three. Nest, built by both sexes, an open cup of moss, wool, hair, etc. on base of coarser twigs, frequently with artificial debris incorporated, sometimes to bizarre extent (one nest had more than 1 kg of such items as pen-nibs, paper clips and the like, stolen from a nearby office), placed in cavity or crevice in rock face, among boulders, in cave or often in ruin or other artificial site; nest sometimes reused in same or subsequent years. In study in NC Colorado (USA): territory size in summer 0·4–2·8 ha (winter 0·2–1·9 ha); mean territory density in summer 4·5/100 ha (winter 3·4/100 ha). Eggs 3–7, usually 6, often fewer in S, mean in NC Colorado 4·5, glossy white with fine reddish-brown speckles; incubation by female alone, fed on nest by male, period 12–19 days, average c. 16–17 days; fledging period 12–19 days, average 15–17 days; young accompanied by parents for up to 2 weeks. Of 28 nests in Colorado study, 22 successfully fledged young and four probably did so.
Movements. Largely sedentary; some altitudinal movement by N populations. Some mobility suggested, however, by occurrences of vagrants in such locations as Saskatchewan (SC Canada) and Nebraska and Kansas (C USA).
Status and Conservation. Not globally threatened. Common to fairly common in suitable habitat. The nature of this species' habitat is such that, in the greater part of its range, human encroachment is relatively rare.
Bibliography. Anon. (1998b), Baicich & Harrison (1997), Behle (1963), Bent (1948), Binford (1989), Campbell *et al.* (1997), Cannings (1995), Contreras (1997), Gómez de Silva (1995), Grinnell & Behle (1935), Hellmayr (1934), Howell & Webb (1995), Johnsgard (1979), Johnston & Ratti (2002), Jones, S.L. (1998), Jones, S.L. & Dieni (1995, 1998), Jones, S.L. *et al.* (2002), Lofberg (1931), Martin (1971), Miller (1948), Minzenmayer *et al.* (1995), Oberholser (1903), Phillips (1986), Phillips *et al.* (1964), Price *et al.* (1995), Ridgway (1904), Root (1988), Rowley (1966), Russell & Monson (1998), Small (1994), Tramontano (1964), Udvardy (1963).


18
19
ssp *unirufa*
ssp *chakei*
20
ssp *unibrunnea*
ssp
olivascens
with white
on head
21
ssp *bogotensis*
ssp *fulva*
with white
on head
22
with white on head
23
ssp *gravesi*
ssp *fitzpatricki*
ssp *platensis*
ssp *potosinus*
25
ssp *stellaris*
ssp *polyglottus*
24
ssp *alticola*
ssp *russelli*
ssp
pulverius
ssp
paludicola
ssp *aequatorialis*
ssp *lucidus*
ssp
aestuarinus
27
ssp *palustris*
ssp *marianae*
26
ssp *griseus*
PLATE 37
inches
4
cm
10

Genus *HYLORCHILUS* Nelson, 1897

18. **Sumichrast's Wren**

Hylorchilus sumichrasti

French: Troglodyte à bec fin **Spanish**: Cucarachero Picofino
German: Schmalschnabel-Zaunkönig
Other common names: Slender-billed Wren

Taxonomy. *Catherpes sumichrasti* Lawrence, 1871, Mato Bejuco, Veracruz, Mexico.
Has been included in genus *Catherpes*. Formerly treated as conspecific with *H. navai*, but the two are quite distinct in plumage and, especially, in vocalizations. Monotypic.
Distribution. SW Veracruz, extreme E Puebla and extreme N Oaxaca, in SC Mexico.



Descriptive notes. 16 cm; female 28·4 g. Upperparts, including flight-feathers, are uniform dark chocolate-brown, slightly more rufous on back; obscure and inconspicuous barring on closed wing; throat whitish-brown, chest orange-brown, belly rich chocolate-brown with small distinct white spots; eyes brown; bill blackish, orange-yellow base of lower mandible; legs dark grey. Sexes similar. Juvenile has dull buff throat with diffuse scaling, whitish flecks on belly. VOICE. Male song of two types, one a sequence of loud, clear ringing whistles starting with a series of short notes and running into longer series of slow descending whistles, the other a shorter verse of 3–5 notes alternating randomly in pitch; female song quite different, a single syllable repeated in series of 4–22 notes; sexes may sing synchronously; songs very different from those of *H. navai*, and neither species responds to tape recordings of the other. Calls also distinct, an emphatic "chewk", a squealing "wheeo" and various scolding notes.
Habitat. Restricted to forested outcrops of karst limestone, including shade coffee plantations on limestone; c. 75–1000 m.
Food and Feeding. Diet mostly invertebrates, including worms, spiders (Araneae), mites (Acarini), bugs (Hemiptera) and beetles (Coleoptera); also, unusually for a troglodytid, small snails frequently taken. Some vegetable matter (small fruit) taken. Feeds mostly on rock surfaces, or by probing into rock crevices with the long bill; also tosses aside fallen leaves in search of prey, and makes short jumping sallies into the air for flying insects, including on one occasion a moth (Lepidoptera).
Breeding. Poorly known. Nest-building observed in Mar, nests with eggs found in May, and adults feeding fledglings in Jul and Aug. Of three known nests, two were in crevice in rocks, the other in roof of limestone cave. Eggs 3, white; no information on incubation and fledging periods; two fledglings from one nest foraged sometimes separately, each with one adult, and sometimes together, with both parents.
Movement. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Total range encompasses c. 6000 km², but the species' required habitat (forested karst outcrops) occupies much smaller area within this; between these pockets of habitat are larger unsuitable areas, now mostly given over to agriculture. Recent investigation located twelve populations, most in outcrops and isolated from others. In areas of occurrence can be very abundant; e.g. one transect in Oaxaca, 738 m long and 200 m wide, yielded a count of 13 males and nine females. Appears able to withstand substantial habitat modification, e.g. the planting of shade coffee, provided that overall forest crown largely intact; can also persist in very small fragments of habitat, down to 0·5 ha. It is unclear whether the species has always been restricted to such outcrops or whether, before destruction of intervening forest, it was more widely distributed. Most serious threat to remaining habitat is from quarrying activities; in addition, some areas have been flooded by construction of new reservoirs.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Blake (1953), Ceballos & Valdelamar (2000), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Crossin & Ely (1973), Gómez de Silva (1997a, 1997b), Gómez de Silva *et al.* (2004), Hardy & Delaney (1987), Hellmayr (1934), Howell & Webb (1995), Pérez-Villafaña *et al.* (1999, 2003), Ridgway (1904), Stattersfield & Capper (2000), Wauer (1986), Wege & Long (1995), Wheatley & Brewer (2001), Whittingham & Atkinson (1996).

19. **Nava's Wren**

Hylorchilus navai

French: Troglodyte de Nava **German**: Navazaunkönig **Spanish**: Cucarachero de Nava
Other common names: Crossin's Wren

Taxonomy. *Hylorchilus sumichrasti navai* Crossin and Ely, 1973, 26 km north of Ocozocoautla, Chiapas, Mexico.
Originally described as a race of *H. sumichrasti*, but more recent studies of vocalizations indicate that the two are distinct species. Monotypic.
Distribution. S Mexico: confined to very limited area in SE Veracruz and NW Chiapas and, very marginally, NE Oaxaca.
Descriptive notes. 16 cm; female 29·3 g. Has tawny-brown face, greyish lores; crown and upperparts dark, rich brown, remiges faintly barred blackish; throat and upper chest whitish, becoming pale grey on lower chest, with faint scalloping; flanks dark sooty brown, vent dusky grey-brown; eye brown; bill blackish, pale orange-yellow base of lower mandible; legs dark grey. Sexes similar. Juvenile undescribed. VOICE. Song described as a varied, often stuttering warble of mellow whistles, sometimes introduced by few slightly accelerating soft notes and terminating in strongly upslurred note; quite different from song of *H. sumichrasti*, and neither responds to tape recordings of the other's song. Female's song only recently described, an introductory note followed by rapid series of 8 or more loud whistles, appears to be used agonistically; not highly co-ordinated with that of male (in contrast to many tropical troglodytids), usually overlaps with male's song, but may



start near beginning, middle or end of it, somewhat at random. Call a metallic "tink", quite distinct from calls of its congener.
Habitat. Forest on outcrops of karst limestone; c. 75–800 m. In contrast to *H. sumichrasti*, seems to require undisturbed forest; no evidence of colonization of secondary habitat.
Food and Feeding. No data on food; probably largely or wholly invertebrates. Forages on rocky ground and in crevices on rock faces.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Los Tuxtlas and Uxpanapa EBA. Total range only c. 4800–4900 km², within which suitable habitat covers much smaller area; intervening areas between isolated forested outcrops of karst limestone now largely deforested for agriculture, leaving remaining habitat highly fragmented. Currently known from six sites in E Veracruz, one in W Chiapas and two in NE Oaxaca. Some of its range is protected by the Selva El Ocote Biosphere Reserve, although this contains very little suitable habitat and the species is not present at many sites there; a more important reserve would be the proposed Chimalapas–Uxpanapa Biosphere Reserve. Although the outcrops themselves are unsuitable for agriculture, firewood-gathering at unprotected sites is a significant threat. It has been suggested that the species should more properly be categorized as Endangered.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Atkinson *et al.* (1993), Ceballos & Valdelamar (2000), Collar & Andrew (1988), Collar *et al.* (1992), Crossin & Ely (1973), Gómez de Silva (1995, 1997a), Gómez de Silva & Sada (1997), Gómez de Silva *et al.* (2004), Howell & Webb (1995), Stattersfield & Capper (2000), Wege & Long (1995), Wheatley & Brewer (2001), Whittingham & Atkinson (1996).

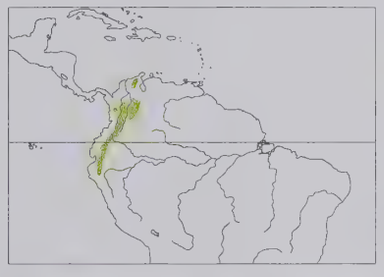
Genus *CINNYCERTHIA* Lesson, 1844

20. **Rufous Wren**

Cinnycerthia unirufa

French: Troglodyte roux **German**: Einfarb-Zaunkönig **Spanish**: Cucarachero Rufo
Other common names: Brown Wren

Taxonomy. *Limnornis unirufus* Lafresnaye, 840, Santa-Fe-de-Bogotá, Colombia.
Three subspecies recognized.
Subspecies and Distribution.
C. u. chakei Aveledo & Ginés, 1952 – Sierra de Perijá, on Colombia–Venezuela border.
C. u. unibrunnea (Lafresnaye, 1853) – Colombia (N part of W Andes, and C Andes) S to N Peru (Piura, Cajamarca).
C. u. unirufa (Lafresnaye,1840) – E Andes in extreme SW Venezuela (Táchira) and Colombia (S to Cundinamarca).



Descriptive notes. 16·5 cm; 21–29 g. Plumage is entirely brown of different shades; crown orange-brown, nape and shoulders deeper chestnut, becoming more reddish-brown on lower back; primaries and secondaries chestnut, narrowly barred blackish; rectrices reddish-brown with inconspicuous darker bars; chin paler, chest orange-brown, becoming reddish-brown on vent; lores blackish; bill and legs black. Sexes similar. Juvenile resembles adult, but barring on flight-feathers largely absent. Nominate race has brown eyes. Race *unibrunnea* is darker and duller than nominate; *chakei* differs in having whitish or grey eyes. VOICE. Song loud and arresting, a rapidly repeated 2-note or 3-note motif, e.g. "chew-tu", with loud metallic trill superimposed, the whole lasting for at least 10 seconds; by both sexes in duet, sometimes with participation of other group-members. Call a soft "churr" or "whit-whit"; loud, harsh "geea" when mobbing intruders.
Habitat. Wet montane forest, forest edge and shrub-forest, often with *Chusquea* bamboo; 2200–3800 m.
Food and Feeding. Few data; food apparently entirely invertebrates. Forages low down; turns over litter on ground. Gregarious; often joins mixed-species flocks.
Breeding. Birds in breeding condition from Jun to Aug in Sierra de Perijá (*chakei*); juvenile of race *unibrunnea* observed in Mar in Colombia. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common to locally common where suitable habitat remains. Occurs in several protected areas, e.g. Munchique National Park, in Colombia, and Podocarpus National Park, in Ecuador.
Bibliography. Baez *et al.* (1997), Best *et al.* (1997), Chapman (1917), Cracraft (1985), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Varty *et al.* (1986), Williams & Tobias (1994).

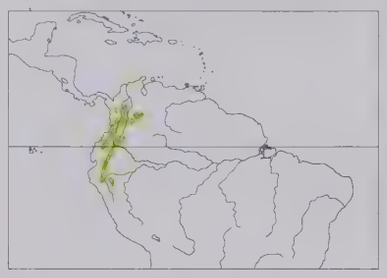
21. **Sharpe's Wren**

Cinnycerthia olivascens

French: Troglodyte de Sharpe **Spanish**: Cucarachero Sepia
German: Nördlicher Sepiazaunkönig
Other common names: Sepia-brown Wren (when merged with *C. peruana* and *C. fulva*)

On following pages: 22. Peruvian Wren (*Cinnycerthia peruana*); 23. Fulvous Wren (*Cinnycerthia fulva*); 24. Sedge Wren (*Cistothorus platensis*); 25. Merida Wren (*Cistothorus meridae*); 26. Apolinar's Wren (*Cistothorus apolinari*); 27. Marsh Wren (*Cistothorus palustris*).

Taxonomy. *Cinnicerthia* [*sic*] *olivascens* Sharpe, 1882, Santa Elena, Antioquia, Colombia.
Formerly treated as conspecific with *C. peruana* and *C. fulva*; recent studies indicate, however, that the three are distinct species, differing in e.g. plumage and/or voice. Two subspecies recognized.
Subspecies and Distribution.
C. o. olivascens Sharpe, 1882 – W & C Andes of Colombia (S from Antioquia) S to extreme N Peru.
C. o. bogotensis (Matschie, 1885) – W slope of E Andes of Colombia (Santander S to Cundinamarca).



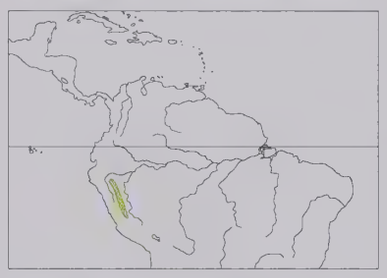
Descriptive notes. 16 cm; male average 25·9 g, female average 23 g. Nominate race has entire plumage different shades of brown, many individuals with variable amount of white on face; crown dark greyish-brown, back and rump reddish-brown, primaries and secondaries bright red-brown with dull blackish bars, extending to greater upperwing-coverts; rectrices chestnut-brown with numerous fine blackish bars; chin and throat pale greyish-brown, belly and vent deep reddish-brown; eye light brown or grey; bill dark grey-brown; legs grey. Sexes similar. Immature is very similar to adult, postocular area greyish. Race *bogotensis* is much darker than nominate, never any white on face. Voice. Song complex and variable, a series of musical phrases with changing stress. Call a soft, low "wurt".
Habitat. Wet mossy forest, including forest edge and cloudforest, often with *Chusquea* bamboo; mainly 1500–3100 m, but down to 900 m on Pacific slope of Colombia (Cauca).
Food and Feeding. No information on diet. Forages on or near the ground, usually in dense vegetation. Gregarious, in flocks of up to ten individuals.
Breeding. Birds in breeding condition in Jun–Aug in Colombia. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Fairly common in suitable habitat in most of range. Occurs in several protected areas, e.g. Archidona Natural Reserve, in Ecuador.
Bibliography. Best *et al.* (1997), Brumfield & Remsen (1996), Chapman (1917), Clements & Shany (2001), Fjeldså & Krabbe (1990), Hellmayr (1934), Hilty & Brown (1986), Hornbuckle (1999a), Kirwan & Marlow (1996), López *et al.* (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Salaman (1994), Salaman *et al.* (1999).

22. **Peruvian Wren**

Cinnycerthia peruana

French: Troglodyte brun **German**: Sepiazaunkönig **Spanish**: Cucarachero Peruano
Other common names: Peruvian Brown Wren; Sepia-brown Wren (when merged with *C. olivascens* and *C. fulva*)

Taxonomy. *Presbys peruanus* Cabanis, 1873, Maraynioc, Junín, Peru.
Formerly treated as conspecific with *C. olivascens* and *C. fulva*; recent studies indicate, however, that the three are distinct species, differing in e.g. plumage and/or voice. Monotypic.
Distribution. Andes of Peru (from Amazonas S to Ayacucho).



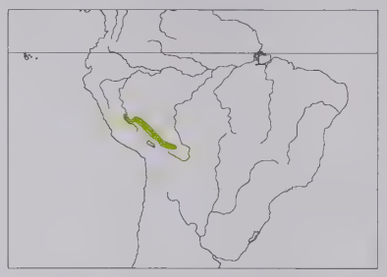
Descriptive notes. 15·5–16 cm; 19·6 g. Has upperparts rich chestnut-brown, nape and back less rufescent than crown and rump; many adults have variable amount of white on the face, usually around eye and on forehead, sometimes considerably more extensive (possibly indicative of social status within group); primaries, secondaries and upperwing-coverts rich chestnut, conspicuously marked with narrow black bars; rectrices rich chestnut-brown, finely barred blackish; chin and throat orange-brown, chest, belly and flanks duller and darker; eyes chestnut; bill dark brown, gape yellow; feet black. Sexes similar. Juvenile apparently resembles adult, but never any white on face. Voice. Song, frequently as duet by the sexes, a magnificent series of rich trills and clear whistles, with some phrases reminiscent of European nightingale (*Luscinia*). Call described as a gravelly, chattering "ch-d-d-d", often given by group-members together.
Habitat. Wet montane forest, second growth and forest edge; 1500–3300 m.
Food and Feeding. No information on food. Usually feeds on or near ground, rummaging around in vegetation and litter. Frequently in groups, seemingly extended families, consisting of a pair of adults with immatures and young juveniles.
Breeding. Poorly documented. Nest with one newly hatched chick and one egg in Sept in Huánuco; also, fledglings observed in Aug and juveniles in Feb, Jun and Nov, indicating possibly protracted breeding season. Huánuco nest pouch-shaped, 20 cm wide, 30 cm long and 15 cm high, pouch 10 cm × 10 cm × 15 cm, with downturned tunnel leading to circular entrance hole, made from rootlets interwoven with green moss, dry bamboo leaves in upper part of pouch, entrance encircled by green moss; suspended from curving bamboo stem; egg pale cream-white with sparse red speckles. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in suitable habitat in parts of its range.
Bibliography. Brumfield & Remsen (1996), Clements & Shany (2001), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Gochfeld (1979), Graves (1980, 1985b), Hellmayr (1934), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Tudor (1989), Taczanowski (1884).

23. **Fulvous Wren**

Cinnycerthia fulva

French: Troglodyte fauve **German**: Südlicher Sepiazaunkönig **Spanish**: Cucarachero Fulvo
Other common names: Superciliated Wren(!); Sepia-brown Wren (when merged with *C. olivascens* and *C. peruana*)

Taxonomy. *Thryophilus fulvus* P. L. Sclater, 1874, Huasampilla, 10,000 feet [c. 3000 m], Cuzco, Peru.
Formerly treated as conspecific with *C. olivascens* and *C. peruana*; recent studies indicate, however, that the three are distinct species, differing in e.g. plumage and/or voice. Three subspecies recognized.
Subspecies and Distribution.
C. f. fitzpatricki Remsen & Brumfield, 1998 – Cordillera de Vilcabamba, in C Peru.
C. f. fulva (P. L. Sclater, 1874) – E Andes of Peru (Cuzco).
C. f. gravesi Remsen & Brumfield, 1998 – S Peru (Puno) S to C Bolivia (Cochabamba).



Descriptive notes. 14·5 cm; male average 18·4 g, female average 14·8 g. Nominate race has supercilium and area above bill pale buff, contrasting with dull brown lores and reddish-brown crown; ear-coverts cinnamon-buff; some adults show white feathering on face (usually less extensive than in *C. peruana*); back reddish-brown, becoming more rufescent on rump; primaries and secondaries reddish-brown on outer webs, numerous narrow blackish bars on closed wing; rectrices reddish-brown with numerous narrow blackish transverse bars; throat buffy white, chest cinnamon-buff, flanks and thighs darker reddish-brown; eyes nut-brown; upper mandible blackish, lower mandible lead-grey; legs dark brown. Sexes similar. Immature resembles adult, but eye duller brown, cap greyish. Race *fitzpatricki* has darker crown than nominate, whitish supercilium and buffy white chin and throat; *gravesi* is paler below, has whitish supercilium contrasting with darker auriculars. Voice. Undescribed; stated to be rather quiet in comparison with *C. peruana*.
Habitat. Wet montane forest ; 1500–3300 m.
Food and Feeding. No information on food items. Forages low in dense vegetation or on ground, often in small flocks.
Breeding. Birds in breeding condition in Jan in Bolivia (La Paz, Cochabamba). No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Fairly common in some locations; e.g. common at Cock-of-the-rock Lodge, in Peru. Generally poorly known.
Bibliography. Brumfield & Remsen (1996), Clements & Shany (2001), Fjeldså & Krabbe (1990), Green (1999), Hellmayr (1934), Hennessey *et al.* (2003), Remsen & Brumfield (1998), Ridgely & Tudor (1989), Walker (2001).

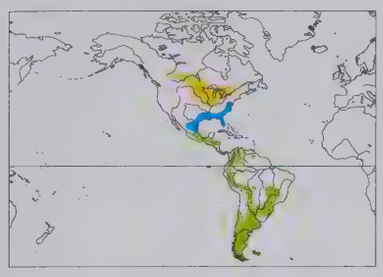
Genus *CISTOTHORUS* Cabanis, 1850

24. **Sedge Wren**

Cistothorus platensis

French: Troglodyte à bec court **German**: Seggenzaunkönig **Spanish**: Cucarachero Sabanero
Other common names: Short-billed Marsh Wren ("*stellaris* group"); Grass Wren (Neotropical races)

Taxonomy. *Sylvia platensis* Latham, 1790, Buenos Aires, Argentina.
Probably closely related to *C. meridae* and *C. apolinari*. Taxonomy complex. Races form three geographical groups: "*stellaris* group" (North America S to Panama), "*aequatorialis* group" (NW South America, from Colombia E to Guyana and S to Bolivia) and "nominate group" (S South America, from N Argentina and SE Brazil S to Tierra del Fuego). Wide disparities in vocalizations suggest that these groups likely to represent three distinct species; also, the two Neotropical groups possibly worthy of further subdivision. Proposed race *boliviae* (from Santa Cruz, in Bolivia) considered indistinguishable from *minimus*. Twenty subspecies recognized.
Subspecies and Distribution.
C. p. stellaris (J. F. Naumann, 1823) – breeds from S Canada (E Saskatchewan, C Manitoba, S Ontario and S Quebec) S in USA to N Kentucky, E Pennsylvania and New York; non-breeding winters from E USA (Virginia) S through coastal states to Texas and NE Mexico.
C. p. potosinus Dickerman, 1975 – NC Mexico (San Luis Potosí).
C. p. tinnulus R. T. Moore, 1941 – C Mexico (Nayarit S to Michoacán, México and Distrito Federal.
C. p. jalapensis Dickerman, 1975 – E Mexico (C Veracruz).
C. p. warneri Dickerman, 1975 – E Mexican lowlands in Veracruz, Tabasco and Chiapas.
C. p. russelli Dickerman, 1975 – Belize (Toledo and Cayo districts).
C. p. elegans P. L. Sclater & Salvin, 1859 – highlands of SE Mexico (from Veracruz) and Guatemala.
C. p. graberi Dickerman, 1975 – interior & E Honduras and NE Nicaragua.
C. p. lucidus Ridgway, 1903 – C Costa Rica S (at least formerly) to W Panama.
C. p. alticola Salvin & Godman, 1883 – mountains of N Colombia, W, N & E Venezuela and W Guyana.
C. p. tolimae Meyer de Schauensee 1946 – N part of C Andes of Colombia (Caldas, Tolima).
C. p. aequatorialis Lawrence, 1871 – S end of C Andes of Colombia S to C Peru (S to C Junín).
C. p. tamae Cory, 1916 – SW Venezuela (S Táchira) and E Colombia.
C. p. graminicola Taczanowski, 1874 – SC Peru (Junín, Cuzco).
C. p. minimus Carriker, 1935 – S Peru S to S Bolivia.
C. p. tucumanus Hartert, 1909 – NW Argentina (Jujuy S to Catamarca and Tucumán).
C. p. polyglottus (Vieillot, 1819) – Paraguay and SE Brazil.
C. p. platensis (Latham, 1790) – E Argentina (E from Córdoba and Mendoza).
C. p. hornensis (Lesson, 1834) – C Chile and S Argentina (S from c. 41° S) S to Cape Horn.
C. p. falklandicus Chapman, 1934 – Falkland Is.
Descriptive notes. 9–11·5 cm; male 7·8–8·9 g and female 7·1–8·9 g (North American *stellaris*), average 9 g (one Central American population), 8·2–9·8 g (Argentina). Nominate race has bright buff supercilium, blackish-brown crown, shoulders and back with conspicuous pale buff streaks; rump and uppertail-coverts buff-brown, few streaks; upperwing-coverts buff-brown, some buff streaks; primaries and secondaries with dark inner webs, buff-brown outer webs with conspicuous dark markings (obvious bars on closed wing); rectrices buff-brown with blackish-brown bars; whitish-buff below, somewhat darker on chest, orange-buff on flanks and lower belly; eyes brown; bill dull blackish above, yellowish below; legs pinkish-brown, feet darker brown. Sexes similar. Juvenile resembles adult, but reduced white streaking above, paler underparts. Race *hornensis* is similar to nominate but more heavily streaked above; *falklandicus* resembles previous, but has heavier bill, longer wings and proportionately shorter tail; *tucumanus* is longer-billed than nominate, lower back and rump unspotted; *polyglottus* is smallest of "nominate group", with slender bill, narrow buffy-white supercilium, unspotted rump, blackish inner webs of rectrices; *aequatorialis*



has bright buff lores, heavy bars on rectrices, broad buffy supercilium; *alticola* is similar to last, but wing and tarsus shorter, supercilium less obvious; *tamae* is also similar, but generally more rufescent; *graminicola* is paler, crown well streaked buff; *minimus* is smaller than previous, inner webs of rectrices black; *tolimae* is larger than *aequatorialis*, less rufescent on upperparts, duller on side of neck and body; *stellaris* has ground colour of crown less dark than nominate, crown streaks buff-white, shoulders orange-buff, outer webs of flight-feathers barred with orange-buff and dark brown, orange-buff pectoral band and flanks, lower flanks with darker bars; *tinnulus* is paler and more buffy than previous, with little crown streaking; *potosinus* resembles last, but paler and more sandy; *jalapensis* is darker brown than preceding two, with more extensive black on crown; *warneri* is paler than last; *russelli* has darker and richer coloration, with reddish-brown nape; *elegans* is strongly striped on back, crown heavily streaked; *graberi* is more grey than last, little streaking on crown; *lucidus* has more heavily streaked crown, with dorsal stripes whitish. Voice. Male has large repertoire of songs (300–400 in some populations), quality of songs varies considerably, from dry staccato chatter (North America) to more liquid phrases (Central and South America); North American males improvise songs, but tropical and S races imitate songs; successive songs usually different, but under low motivation male may give several songs of one kind before switching; song in Falklands (race *falklandicus*) repetition of warbled phrases e.g. "siu-siu-siu", "chiwi-chiwi-chiwi" and "cli-cli-cli", each separated by low trill. Female does not sing. Calls a sharp "chad" or "tak", also less intense "chep" singly or in series; also "ti-ti-ti" in Falklands; scolds with low nasal buzz.

Habitat. In North America, breeds mainly in damp, sedgy meadows, often with small scattered bushes; sometimes margins of *Sphagnum* bogs with cotton-grass (*Eriophorum*); sometimes found in weedy rice fields, but (in contrast to *C. palustris*) not usually in areas of standing water; in winter, both fresh and brackish sedge meadows, as well as palmetto prairie, old fields with matted vegetation, grassy marsh edge and similar. South American populations occupy wider variety of habitats, from open grass savanna in Venezuela and partially flooded alder (*Alnus*) forest and bamboo bogs in Colombia to wet high-altitude *páramo* grassland in Ecuador, dry *cerrado* grassland in Brazil, borders of tidal marshes in Argentina, and tussac (*Parodiochloa flabellata*) grassland in Falkland Is; sea-level to 4000 m.

Food and Feeding. Stomach contents of wintering individuals (race *stellaris*) in SE USA (Florida) included ants (Hymenoptera), bugs (Hemiptera), weevils (Curculionidae), ladybirds (Coccinellidae), moths and caterpillars (Lepidoptera), and locusts, grasshoppers and crickets (Orthoptera); a specimen of *hornensis* taken in mid-winter in Tierra del Fuego (when ground snow-covered) had been feeding on insects and grass seeds. Forages mostly low down in vegetation; skulks.

Breeding. N race *stellaris* has extended season May–Sept, early nesting concentrated mostly in NC part of range (e.g. Saskatchewan, North Dakota, Minnesota, Wisconsin), frequently much later, Jul–Sept, in E & S parts (probable that same individuals involved, as arrival in latter areas often coincides with disappearance from N areas); in S of species' range, recently fledged young seen in Jan and May in Ecuador and in Apr in Peru ("*aequatorialis* group"); nesting Oct–Dec in Falklands (race *falklandicus*), one brood. Following details refer to race *stellaris* except where otherwise stated. Male frequently polygamous; often in loose colonies. Male builds multiple nests (up to nine per season), the one used for breeding being lined by female, nest globular, c. 10 cm tall, 8 cm wide and 8 cm deep, side entrance c. 2·5 cm in diameter, leading to cavity c. 6 cm deep, 4 cm long and 6 cm wide, built with fine grasses and sedges interwoven with plant down, lined with feathers, down and fine grasses, located in sedges and tall grasses, usually 25–50 cm above ground; nest of race *falklandicus* a ball of grass well lined with white feathers or wool, 0·3–1·1 m above ground, and one of *hornensis* was in bore of disused cannon (this race stated to surround nest entrance with thorns). Clutch 4–8 eggs (average 7) for first broods, fewer than 6 for second broods, unmarked white, but *hornensis* eggs variously described as white with light reddish tones, spotted with reddish or brown flecks (in contrast to those of *stellaris*) or plain white; incubation by female alone, period c. 14 days; chicks fed almost entirely by female, male involvement at most very limited and often none, fledging period 12–14 days.

Movements. North American populations (*stellaris*) highly migratory, with no overlap in breeding and non-breeding grounds; in addition, appears to be nomadic during breeding season. Nocturnal migrant. Spring migration begins early Apr in S part of range, peak over N part late Apr and first two weeks of May; post-breeding migration to S starts Aug or early Sept. Males may, on average, winter farther N than females. Extralimital occurrences in California and New Mexico. Remaining populations, including Mexican and Central American races of "*stellaris* group", appear to be sedentary, as do South American ones; S race *hornensis* spends austral winter in a very severe climate with snow cover, but the fact that type specimen was "taken at sea twenty leagues south-east of Cape Horn" suggests at least some partial migration.

Status and Conservation. Not globally threatened. Locally fairly common to uncommon. Because of its nomadic habits in North America, very difficult to census accurately; some evidence suggests regular increase in Canada over years 1991–2000; may have increased during period of European colonization as forest clearance produced suitable habitat. Highest population density perhaps up to 68 males/10 ha, but densities on average usually much lower. Was considered a "Species of Special Concern" during 1982–1986 owing to depressed populations in Midwest prairie region; currently considered "Endangered", "Threatened" or of "Special Concern" in nine states in Midwest and NE USA. Little detailed information about Central and South American populations; fairly common to uncommon in Mexico; race *lucidus* apparently extirpated in Panama but still quite common in parts of Costa Rica; uncommon to rare in SE Brazil. Falklands population (*falklandicus*) estimated at 1300–2300 pairs during 1983–1993.

Bibliography. Anon. (1998b), Badzinski (2001), Baicich & Harrison (1997), Bedell (1996), Bent (1948), Bloch *et al.* (1991), Bowles (1893), Burns (1982), Canevari *et al.* (1991), Carriker (1935), Castellanos (1935), Cawkell & Hamilton (1961), Couve & Vidal-Ojeda (2003), Cracraft (1985), Crawford (1977), Crawshay (1907), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Farabaugh (1996), Fjeldså & Krabbe (1990), Hanowski *et al.* (1999), Harris (1998), Hayes (1995), Hellmayr (1934), Herkert (1994), Herkert *et al.* (2001), Hilty & Brown (1986), Howell & Webb (1995), Humphrey *et al.* (1970), Jaramillo (2003), Johnsgard (1979), Johnson (1967), Kroodsma (1998), Kroodsma & Verner (1978), Kroodsma, Liu *et al.* (1999), Kroodsma, Sánchez *et al.* (1999), Kroodsma, Woods & Goodwin (2002), Lesson (1834), Lingle & Bedell (1989), Meanley (1952), Meyer de Schauensee & Phelps (1978), Minzenmayer *et al.* (1995), Mousley (1934), Parker *et al.* (1985), Peck & James (1997), de la Peña (1987, 1989), de la Peña & Rumboll (1998), Pettingill (1973), Picman & Picman (1980), Price *et al.* (1995), Reynolds & Krausman (1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robbins (1999), Schramm *et al.* (1986), Shirihai (2002), Short (1975), Sick (1993, 1997), Slud (1964), Small (1994), Stiles & Skutch (1989), Taylor *et al.* (1983), Traylor (1988), Udvardy (1963), Verner & Engelsen (1970), Vuilleumier (1985), Walkinshaw (1935), Wetmore (1926), Woods & Woods (1997).

25. Merida Wren

Cistothorus meridae

French: Troglodyte du Mérida **German**: Meridazaunkönig **Spanish**: Cucarachero de Mérida
Other common names: Paramo Wren

Taxonomy. *Cistothorus platensis meridae* Hellmayr, 1907, El Loro, 3000 m, Mérida, Venezuela.
Probably closely related to *C. platensis* and *C. apolinari*. Monotypic.

Distribution. Venezuelan Andes from S Trujillo (Teta de Niquitao) S to N Táchira.



Descriptive notes. 10 cm. Has off-white supercilium, broader behind eye, brown-mottled ear-coverts and lores; crown and nape medium brown, streaked darker brown, shoulders and upper back blackish-brown, streaked off-white, rump and uppertail-coverts barred dull blackish and rich brown; upperwing-coverts bright buffy brown, conspicuously barred dark brown; outer webs of primaries and secondaries barred blackish-brown and buff-brown; rectrices medium brown, sharply barred blackish; chin and throat off-white, chest buffy, flanks deeper buff with a few diffuse darker bars, thighs buff with dull blackish-brown bars; eyes brown; bill brown above, pale pinkish below; legs pinkish-grey. Sexes similar. Juvenile undescribed. Voice. Male repertoire of 20–25 different songs, repertoire varying individually and geographically, song mostly of two or three phrases, some of these rather pure whistles, others more raspy or buzzy, one song repeated several times before switching to another; female occasionally utters dry trill of simple notes accompanying male song. Scolds with low buzz.

Habitat. Wet areas of *páramo*, typically with the hirsute ground plant *Espeletia* ("*frailejón*") and bushes; 3000–4100 m.

Food and Feeding. Arthropods; no published details on items. Forages low down in vegetation.

Breeding. Season not recorded. Duetting song type more typical of a monogamous wren than of a routinely polygamous one. No breeding nests described; dormitory nest (several found in May and Jun) domed, with side entrance, outer shell of woven grass stems, inner lining made of fine hairs taken from *Espeletia* leaves, one placed 50 cm up in an *Espeletia* plant, the others in clumps of sedge. No other information.

Movements. Some evidence of local movement, probably altitudinal; seems to vacate some areas in rainy season.

Status and Conservation. Not globally threatened. Restricted-range species: present in Cordillera de Mérida EBA. Reasonably common in many places; all known sites fall within an area of no more than c. 200 km × 40 km. Despite its small global range, the harsh nature of its habitat does not invite much human interference. Some areas of its range are protected.

Bibliography. Cracraft (1985), Farabaugh (1996), Fjeldså (1985), Fjeldså & Krabbe (1990), Hellmayr (1934), Hilty (1999), Kroodsma (1998), Kroodsma *et al.* (2001), Meyer de Schauensee & Phelps (1978), Ridgely & Tudor (1989), Wheatley (1994).

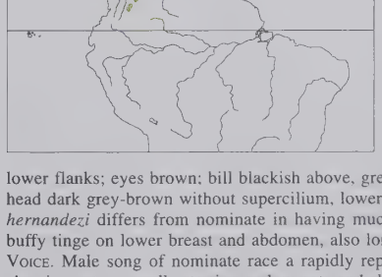
26. Apolinar's Wren

Cistothorus apolinari

French: Troglodyte d'Apolinar **German**: Apolinarzaunkönig **Spanish**: Cucarachero de Apolinar
Other common names: Apolinar's Marsh Wren

Taxonomy. *Cistothorus apolinari* Chapman, 1914, Suba marshes, 8600 feet [c. 2620 m], 4 miles [c. 6·4 km] east of Bogotá, Colombia.
Probably closely related to *C. platensis* and *C. meridae*. Recently described race *hernandezi* differs markedly from nominate in habitat requirements, social organization and vocalizations, and possibly represents a separate species; further study required. Two subspecies recognized.

Subspecies and Distribution.
C. a. apolinari Chapman, 1914 – Cundinamarca and Boyacá, in Colombian Andes.
C. a. hernandezi Stiles & Caycedo, 2002 – Sumapaz massif (S of Bogotá), in Cundinamarca (Colombia).



Descriptive notes. 12 cm; one male 17·7 g (*hernandezi*). Nominate race has crown dull chestnut-brown, side of face grey-brown, very obscurely patterned; postocular supercilium very obscure, slightly paler than crown and ear-coverts; back and shoulders blackish-brown, lateral streaks of whitish-buff extending to mid-back; lower back and rump bright rufescent brown; upperwing-coverts medium brown, barred dark brown; outer webs of primaries and secondaries barred dark brown and pale buff-brown; rectrices rufescent, barred blackish-brown; pale buff-brown below, lighter on throat, darker on chest, more rufescent on lower flanks; eyes brown; bill blackish above, grey below; legs grey. Sexes similar. Juvenile has head dark grey-brown without supercilium, lower nape buff, back less streaked than adult. Race *hernandezi* differs from nominate in having much more whitish on underparts, without strong buffy tinge on lower breast and abdomen, also longer wing, shorter tail, longer and heavier bill. Voice. Male song of nominate race a rapidly repeated sequence of half a dozen harsh, sawing churring notes, usually starting on low note and alternating up and down, or a series of rising and falling churrs mixed with harsh gravelly notes; repertoire of 6–7 song types. By contrast, *hernandezi* has larger repertoire of at least 11 song types, and both sexes sing, female often initiating a bout of song; communal singing frequent with this race, males singing antiphonally with different songs or in duet with similar song types.

Habitat. Nominate race inhabits marshland and lake-edge vegetation, especially cat-tails (*Typha*) and bulrushes (*Scirpus*); occurs at 2500–3000 m, one site at 3015 m. Race *hernandezi* in boggy páramo dominated by the shrub *Diplostephium revolutum*, also more open *páramo* with *Espeletia grandiflora*, but the dwarf bamboo *Chusquea tessellata* (used for nesting) appears to be an essential requirement; 3800–3900 m.

Food and Feeding. Details of food items of nominate race come entirely from faecal samples collected from trapped individuals; predominantly *Chironomus* midges (74%), followed by spiders

(Araneae), assorted dipteran flies, mosquitoes (Culicidae), lepidopteran larvae, and similar; largest prey item recorded was damselflies (Zygoptera). For race *hernandezi*, "well-digested insect remains" found in stomach. When foraging, climbs up vegetation stems and then drops down to near water level.

Breeding. Little information on nominate race: males in breeding condition in Mar and Aug, eggs recorded in Jul, recently fledged young as late as Oct, possibly double-brooded; may breed in loose colonies; one nest (possibly a surplus non-breeding nest) described, an unlined ball c. 15 cm in diameter, made of *Typha* leaf strips, placed 1·5 m above water level in thick *Typha*. Race *hernandezi* a co-operative breeder, with groups of 5–10 individuals participating in care and defence of nest, although only one pair breeds; nest roughly spherical, side entrance, coarsely woven from grass stems and leaves, lined with woolly leaves of *Espeletia*; 2 eggs, white, incubated by female alone. Nests (of nominate race) parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Sedentary. Individuals of nominate race observed away from regular sites, perhaps indicating some tendency for local movement.

Status and Conservation. ENDANGERED. Restricted-range species: present in Colombian East Andes EBA. Rare. Global range covers c. 1570 km², but found only in very limited areas within this. Has always been highly restricted in range and in habitat. If the races are upgraded taxonomically, to represent two full species, nominate would be classified as Critical. One recent estimate of total population of nominate is in region of 250 adults; up to 95% of its habitat in the Cundinamarca–Boyacá Altiplano has been destroyed in the last 50–70 years, and much of remainder is in danger of degradation through landfilling, sedimentation, pollution and recreational use; a further recent threat comes from nest parasitism by Shiny Cowbird, first documented in 1999, since when several cases have occurred, and cowbird populations in the area appear to be increasing. Presently, the largest known populations of nominate are at Laguna de Tota (Boyacá) and Laguna de Fúquene (Cundinamarca), each estimated at c. 50 pairs; several locations near Bogotá may hold up to 20 pairs. Race *hernandezi* has been recorded from only two locations, both in the Sumapaz National Park (Cundinamarca), where its population density seems to be quite high; because of security considerations, other possibly suitable locations not yet investigated. Protected habitat includes also El Cocuy National Park (Boyacá), but, given the current state of civil disorder in Colombia, designation as a protected area does not necessarily guarantee actual protection. It is suggested that *hernandezi* merits the conservation category of Vulnerable.

Bibliography. Borrero (1953), Cadena (2003), Caycedo & Renjifo (2002), Chapman (1917), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Farabaugh (1996), Fjeldså (1985), Fjeldså & Krabbe (1990), Hellmayr (1934), Hilty (1985), Hilty & Brown (1986), King (1978/79), Kroodsma (1998), Meyer de Schauensee (1982), Negret (2001), Renjifo *et al.* (1997), Ridgely & Tudor (1989), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stiles & Caycedo (2002), Varty *et al.* (1986), Velásquez *et al.* (2000), Wege & Long (1995).

27. Marsh Wren

Cistothorus palustris

French: Troglodyte des marais **German**: Sumpfzaunkönig **Spanish**: Cucarachero Pantanero
Other common names: Long-billed Marsh Wren; Eastern Marsh Wren ("nominate group"); Western Marsh Wren ("*paludicola* group")

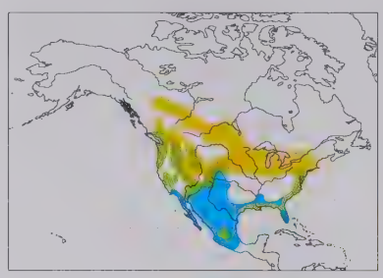
Taxonomy. *Certhia palustris* A. Wilson 1810, borders of the Schuylkill and Delaware Rivers, Pennsylvania, USA.

Sometimes placed in a monotypic genus *Telmatodytes*, but probably closely related to *C. meridae* and *C. apolinari*. Recent studies of song types suggest that W races ("*paludicola* group", also including *browningi*, *pulverius*, *plesius*, *aestuarinus*, *clarkae* and *deserticola*) constitute a separate species from N & E ones ("nominate group"); this possibility supported by DNA studies of populations in limited area of sympatry, where there appears to be an effective reproductive isolation even in habitats where individuals of each song type co-exist. Affinities of isolated C Mexican race *tolucensis* uncertain; studies required. Sixteen subspecies recognized.

Subspecies and Distribution.

C. p. browningi Rea, 1986 – extreme SW Canada (SW British Columbia) S in W USA to C Washington; non-breeding also to SW Washington.
C. p. paludicola S. F. Baird, 1864 – SW Washington and NW Oregon.
C. p. pulverius (Aldrich, 1946) – breeds from C British Columbia and C Idaho S to NE California and NW Nevada; non-breeding NW Oregon and C California S to C Mexico and S Texas.
C. p. plesius Oberholser, 1897 – breeds from SE Idaho S to C Colorado and New Mexico; non-breeding C California, Nevada and Kansas S to C Mexico.
C. p. aestuarinus (Swarth, 1917) – C California (Sacramento and San Joaquin Valleys to San Joaquin delta); non-breeding also W to California coast.
C. p. clarkae Unitt *et al.* 1996 – coastal S California (Los Angeles S to San Diego).
C. p. deserticola Rea, 1986 – interior of S California.
C. p. laingi (Harper, 1926) – breeds SC Canada (N Alberta and C Saskatchewan E to SE Manitoba) and extreme N USA (NE Montana); non-breeding S USA (S Texas) and Mexico (S to E Jalisco, Oaxaca and C Veracruz).
C. p. iliacus Ridgway, 1903 – breeds from Manitoba and SW Ontario S in USA to E Kansas and Missouri; non-breeding S USA (E from SE Texas) and interior Mexico (S as far as Tlaxcala).
C. p. dissaeptus Bangs, 1902 – breeds from S Ontario S to N Ohio, West Virginia and S New England; non-breeding S to S Florida and E Mexico (S to Veracruz).
C. p. palustris (A. Wilson, 1810) – breeds E USA (from Rhode Island S to coastal Virginia and Potomac Valley); non-breeding from New Jersey S to South Carolina, sparsely to Florida.
C. p. waynei (Dingle & Sprunt, 1932) – coasts of S Virginia and North Carolina.
C. p. griseus Brewster, 1893 – coastal marshes from NE South Carolina S to NE coast of Florida.
C. p. thryophilus (Oberholser, 1903) – Gulf coast of Texas and Louisiana.
C. p. marianae W. E. D. Scott, 1888 – Gulf coast from Mississippi E to Florida.
C. p. tolucensis (Nelson, 1904) – C Mexico (Hidalgo and México S to Puebla).

Descriptive notes. 11·5–12·5 cm; male 10·5–13·5 g, female 9–13·5 g. Nominate race has black-brown crown, darkest at side, contrasting prominent pale grey supercilium, medium-brown ear-coverts, olive-brown side of neck; centre of back dull blackish, contrastingly streaked whitish, side of back, shoulders and rump medium brown; outer webs of primaries and secondaries rather obscurely barred brown and blackish-grey; rectrices medium brown, strongly barred darker brown, especially at sides; throat and underparts pale greyish, becoming buffy at sides, lower belly buff, becoming richer and warmer on flanks and vent; eyes brown; bill dark brown above, yellowish-brown below, especially at base; legs pale brown. Sexes similar. Juvenile is generally duller than



adult, white streaks on back reduced or absent, barring on flight-feathers more diffuse, often a dull buff chestband. Race *waynei* is darker above and duller than nominate, undertail-coverts barred dusky; *marianae* resembles previous, but generally sootier and less rufous, with duller flanks; *thryophilus* is smaller and paler than last, smaller and darker than nominate; *griseus* is much greyer than nominate, lacking rich brown tones, with pale, dull flanks; *dissaeptus* has dull brownish flanks and uppertail-coverts, without bars or spots; *iliacus* is similar to previous, but more reddish-brown on flanks, more extensive pale wing markings; *laingi* is less rufescent than previous, paler brown above and with black areas reduced; *paludicola* is warm brown above, with extensive black on crown; *plesius* has pale, dull flanks and upperparts, black on crown usually restricted to side; *pulverius* is similar to last but still paler and duller, with little or no trace of brown chestband; *browningi* is darker than previous two, little black on crown; *clarkae* is brighter and richer brown, with deep rufous rump and flanks; *aestuarinus* has brown colours dark and dingy, but black of crown more intense and extensive; *deserticola* is closest to previous, but with white streaks on back more prominent and brown wash on chest and flanks brighter; *tolucensis* is darker on chest and sides than other races, with back to upper rump almost entirely black and white. VOICE. Male song a bubbling chatter. Two types of singer, suggesting two species: in W (from Pacific E to Great Plains) male repertoire well over 100 songs, whereas in E (Great Plains E to Atlantic Ocean) c. 30–60 different songs; quality of songs also differs, those of W males consisting of great variety of buzzes, rattles, whistles and trills, those of E males less varied and less complex; non-learned call notes also differ between E and W. Females do not sing.

Habitat. Breeds usually in areas with standing water of various depths: most N populations in stands of cat-tail (*Typha latifolia* and *T. angustifolia*), common reed (*Phragmites australis*) or bulrushes (*Scirpus*), S coastal populations usually in brackish marshes where dominant plants are various species of cordgrass (*Spartina*). In winter occurs in both freshwater and brackish habitats. From sea-level to at least 1000 m; disjunct Mexican population (race *tolucensis*) from 1000 m to 2500 m.

Food and Feeding. Mostly arthropods; documented prey items include hymenopterans (ants, bees, wasps), beetles (Coleoptera), bugs (Hemiptera), dipteran flies, dragonfly larvae (Odonata), harvestmen (Opiliones) and spiders (Araneae). In addition, frequently attacks eggs both of conspecifics and of other species, e.g. Red-winged Blackbird (*Agelaius phoeniceus*) or Yellow-headed Blackbird (*Xanthocephalus xanthocephalus*), also occasionally those of such species as Least Bittern (*Ixobrychus exilis*); eggs may be simply attacked or actually eaten. Usually forages low in marsh vegetation, right down to water level.

Breeding. Breeds from May onwards in N, earlier farther S, multiple-brooded (especially in S); no data on isolated Mexican race (*tolucensis*). Polygamy common, but extent appears to vary geographically; in study in SE USA (Georgia) only 5% of males had more than one partner, whereas in S Canada (Manitoba) one population had ten unmated males, 53 monogamists, 48 bigamists and nine trigamists (arguing for skewed sex ratio of only 0·65 males per female). No observations of young helping in rearing of subsequent broods, although this recorded in captivity. Male builds large number of nests (sometimes more than 20 in a season), female then inspects these and adds lining to the one selected; construction of a skeleton non-breeding nest may be completed in 2 days, but complete breeding structure may take 5–8 days; nest domed, c. 18 cm high and 12 cm wide, side entrance hole with small sill (which prevents eggs from rolling out in wind), built of thin strips of leaves and grass, lined with fine leaves, cat-tail down and feathers; usually located c. 1 m (occasionally 3 cm, or up to 5 m) above water or tide level; non-breeding nest distinguished by absence of sill on entrance hole. Clutch size 3–10 eggs, usually 4–6, tending to be larger in N populations (e.g. average 6 in Manitoba and Washington, only 3–4 in Florida), clutch size diminishes as season progresses; egg colour varies somewhat according to race, generally various shades of brown with darker dots and spots, rarely white (sometimes a single white egg in otherwise normal clutch); incubation by female alone, 13–16 days, female may show hostility to male while incubating; chicks tended mainly by female, male's involvement highly variable, in some cases he provides substantial help in brood-feeding, in others (especially when polygamous) little or none; young fledge in c. 13–15 days, may be fed by one or both parents for further 2 days or so.

Movements. Resident and migratory. N populations highly migratory; breeding areas from Canada (interior British Columbia, Alberta) E to New England essentially vacated in winter, although occasional individuals remain as far N as S Ontario. E coastal populations (from S Massachusetts S to S Texas) sedentary or nearly so, with some partial migration in N. Much less migratory in W, where S populations sedentary and those in extreme N partially migratory. Mexican population (race *tolucensis*) appears to be totally sedentary. Judging from casualties at buildings, a nocturnal migrant. One significant long-distance ringing recovery, of individual ringed in S Canada (Saskatchewan) recovered in S USA (Louisiana). Vagrant in Bermuda and Cuba; apparently also in Greenland.

Status and Conservation. Not globally threatened. Common or abundant in many areas with suitable habitat. Densities in optimum habitat can be remarkably high, e.g. up to 167 pairs/ha in coastal *Spartina* marshes in Georgia, although in most habitats density is much lower. Historically, this species has suffered substantial habitat loss through wetland drainage; more recently, with creation of artificial water impoundments, local increases have been recorded. Isolated instances of breeding in NE Ontario and Nova Scotia; stated also to have nested in Greenland. This species' habit of attacking eggs may, in some circumstances, be a limiting factor on populations of the blackbirds *Agelaius phoeniceus* and *Xanthocephalus xanthocephalus*; these two species exhibit hostility towards the wren, to the point even of destroying its nests.

Bibliography. Aldrich (1946), Allen (1914), Anon. (1998b), Armstrong (1955), Baicich & Harrison (1997), Benoit & Askins (2002), Bent (1948), Brenowitz & Kroodsma (1996), Campbell *et al.* (1997), Colyer (2000), Cyr & Larivée (1995), DeGraaf & Rappole (1995), Farabaugh (1996), Hellmayr (1934), Howell & Webb (1995), Jaeger (1980), Johnsgard (1979), Kale (1964, 1965, 1996), Kaufman (1996a), Kirwan (1996), Kroodsma (1979, 1989, 1998), Kroodsma & Canady (1985), Kroodsma & Jared (1987), Kroodsma & Verner (1978, 1997), Leonard (1990), Leonard & Picman (1986, 1987a, 1987b, 1987c, 1988), Linz *et al.* (1996), Manci & Rusch (1988), Metz (1991), Minzenmayer *et al.* (1995), Norton (1994), Oberholser (1897), Peck & James (1987), Peterson *et al.* (1989), Picman (1977a, 1977b, 1980a, 1980b, 1980c, 1986), Picman & Isabelle (1995), Picman, Pribil & Isabelle (2002), Picman, Pribil & Picman (1996), Price *et al.* (1995), Read (1996), Ridgway (1904), Ringler (1987), Root (1988), Skutch (1976), Taylor *et al.* (1983), Tintle (1982), Verner (1963, 1964, 1965, 1975, 1976), Welter (1932, 1935, 1936), Wheeler (1931).

PLATE 38 ➤



PLATE 38

inches 4

cm 10

Genus *THRYOMANES* P. L. Sclater, 1862

28. Bewick's Wren

Thryomanes bewickii

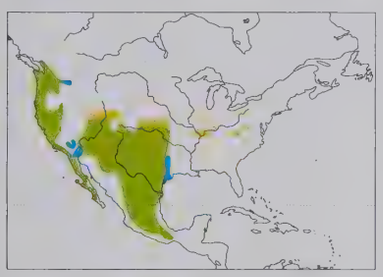
French: Troglodyte de Bewick **German**: Buschzaunkönig **Spanish**: Cucarachero Colinegro

Taxonomy. *Troglodytes bewickii* Audubon, 1827, five miles [8 km] from St Francesville, Louisiana, USA.

Taxonomy complex and highly disputed. Sometimes placed in genus *Troglodytes*, on basis of voice, behaviour and plumage, but this is without reference to DNA considerations; in past, considered by some to form a superspecies with *Troglodytes sissonii* in *Thryomanes*, with suggestion that they might even be conspecific; current information suggests present species may be closely related to *Thryothorus ludovicianus*. Other proposed races: from S California (USA), *correctus* (San Benito County S to San Diego), *nesophilus* (islands of Santa Rosa, Santa Cruz and Anacapa) and *catalinae* (Santa Catalina I), all synonymized with *charienturus*; also, birds from C Mexico (Jalisco, S Zacatecas), described as race *percnus*, appear indistinguishable from *murinus*. Races *leucophrys* (San Clemente I, off S California) and *brevicauda* (Guadalupe I, off Baja California) both extinct. Sixteen extant subspecies recognized.

Subspecies and Distribution.

T. b. calophonus Oberholser, 1898 – extreme SW Canada (SW British Columbia) and W USA (W Washington, W Oregon); non-breeding N California.
T. b. atrestus Oberholser, 1932 – SC Oregon, NE California and WC Nevada.
T. b. marinensis Grinnell, 1910 – NW California (Del Norte S to Marin County).
T. b. spilurus (Vigors, 1839) – C coastal California S to Monterey Bay.
T. b. drymoecus Oberholser, 1898 – C California (including Sacramento Valley).
T. b. charienturus Oberholser, 1898 – S California (S from San Benito County) and NW Mexico (Baja California S to c. 30° N), including some offshore islands.
T. b. cerroensis (Anthony, 1897) – I de Cedros and adjacent mainland of Baja California.
T. b. magdalenensis Huey, 1942 – SW Baja California (26° N S to 24° N).
T. b. eremophilus Oberholser, 1898 – interior SW USA (E California, Nevada and S Utah E to W Texas) and WC Mexico (NE Sonora, Chihuahua and Coahuila S to N Zacatecas).
T. b. bewickii (Audubon, 1827) – C USA (Nebraska and N & E Kansas E to Mississippi).
T. b. cryptus Oberholser, 1898 – W & S Kansas, W Oklahoma and much of Texas (except W) S to NE Mexico (N Nuevo León, N Tamaulipas).
T. b. pulichi (A. R. Phillips, 1986) – E Kansas, Oklahoma.
T. b. sadai (A. R. Phillips, 1986) – coast from S Texas to C Tamaulipas.
T. b. murinus (Hartlaub, 1852) – C plateau of Mexico (from S Zacatecas and S Nuevo León S to Jalisco, Michoacán, Morelos and Tlaxcala).
T. b. mexicanus (Deppe, 1830) – S Mexico (S Puebla, W Veracruz, Oaxaca).
T. b. altus Aldrich, 1944 – very locally E USA (mainly Kentucky, Tennessee, West Virginia, Virginia).



Descriptive notes. 12–13·5 cm; 7·8–11·8 g. Nominate race has greyish lores, conspicuous white postocular supercilium, ear-coverts mottled grey and grey-brown; crown and upperparts rich dark brown, becoming more rufous on rump, feathers of lower back with concealed white spots; primaries and secondaries medium brown, barred blackish-brown on outer webs; central rectrices grey-brown with narrow, sharply defined black bars, outer rectrices blackish with extensive grey-white tips; chin and throat off-white, chest greyish-white, belly buff-white, lower flanks dull brown; eyes brown; bill blackish-brown, pale base of lower mandible; legs dark brown. Sexes similar. Juvenile resembles adult but generally paler, feathers of underparts often with dusky edgings. Race *calophonus* is richer brown above than nominate, flanks more brown, bill longer; *marinensis* is similar to previous but with thinner bill, shorter wing and tail; *spilurus* is browner, less reddish, with stronger brown tinge on flanks; *drymoecus* is larger, duller and paler than nominate; *atrestus* resembles last, but darker and greyer above, and larger; *charienturus* is most like *drymoecus*, but shorter bill, longer tail, less brown upperparts; *cerroensis* is paler and more grey than previous, with still shorter bill; *magdalenensis* resembles last, but smaller and paler grey; *eremophilus* is greyer above and white below, with rather large bill; *murinus* differs from previous in smaller size, darker brown upperparts; *cryptus* is larger than nominate, upperparts more grey, underparts whiter; *pulichi* is less reddish-brown above than nominate; *sadai* is generally small and dull, with little rufescent tinge on flanks; *mexicanus* has dark crown, is dingy white below, heavy barring on crissum; *altus* is darker and more sooty than nominate. Voice. Male has repertoire of 10–20 songs (number varying geographically) that consist of 2–4 phrases or buzzes or repeated notes, sings one song many times before switching to another; young males disperse from natal area, learn the songs at location where they breed. Female does not sing. Calls "plit" as alarm, also scolding buzz.

Habitat. Very varied. Bushy areas, brushland, well-vegetated suburban areas, regenerating farmland; in W North America *chaparral*, but also in pinyon–juniper (*Pinus–Juniperus*) woodland, mesquite (*Prosopis*), riparian cottonwoods (*Populus*); in Mexico found in wide variety of habitats, including arid cactus scrub and city parks with large trees.

Food and Feeding. Food mostly invertebrates. In examination of stomach contents in SW USA (California), 31% of items were bugs (Hemiptera), 21% beetles (Coleoptera), 17% bees and wasps (Hymenoptera), 12% caterpillars, butterflies and moths (Lepidoptera), and remainder various other arthropods. Some vegetable matter taken, especially in winter. Forages on ground and in low vegetation.

Breeding. Egg dates in USA early Mar in Texas to late Apr in E; multiple-brooded in S parts of range, more often single-brooded in NW; no data on Mexican populations. Small proportion of males (15% in one study) polygamous; more rarely, female polyandrous. Nest usually an open cup, more rarely domed, made of grass, rootlets and similar, lined with finer material, often including snakeskins, usually located in cavity such as nestbox or woodpecker (Picidae) hole, or in natural or artificial cranny of wide variety of types, e.g. crevice in rocks, shelf in outbuilding, hole in abandoned motor vehicle, etc. Eggs 3–8, average 5·8, white with variable amounts of brown, lilac or purplish spotting; incubation by female alone, 14–16 days; young fed usually by both sexes, although polygamous male may give less or no help, fledging period 14–16 days.

Movements. Largely sedentary over most of range, with some post-breeding withdrawal from N fringes. E populations migratory, wintering in S states.

Status and Conservation. Not globally threatened. Generally common in much of range. Two races extinct: *brevicauda* (from Guadalupe I, off Baja California) disappeared c. 1903, probably as a result of habitat destruction caused by introduced goats and predation by feral cats; *leucophrys* (from San Clemente I, California) became extinct some time prior to 1986. Over most of range in W North America and also, apparently, in Mexico, this species is frequently common in suitable habitat; decreases reported in British Columbia and increases in Texas and New Mexico. Populations in E North America (race *altus*) expanded greatly in 19th century as a result of clearing of forest for agriculture, with colonization of West Virginia by 1834, Pennsylvania in 1843, New Jersey in 1890 and S Canada (S Ontario) in 1898; subsequently, however, there were major population losses, and at present time only very small numbers survive in Iowa and E of R Mississippi (principally in Kentucky, West Virginia, Virginia and Tennessee). It has been proposed that *altus* be listed as Endangered.

Bibliography. Aldrich (1944), Anon. (1998b), Arizmendi & Márquez (2000), Baicich & Harrison (1997), Bent (1948), Bibbee (1947), Binford (1989), Blake (1953), Burleigh & Lowery (1942), Campbell *et al.* (1997), Contreras (1997), DeGraaf & Rappole (1995), Ehrlich *et al.* (1992), Farley (1987), Fleischer *et al.* (1985), Gorton (1977), Grinnell (1910, 1928a), Hellmayr (1934), Hendricks & Hendricks (1995), Howell & Webb (1995), Hutto (1980), Johnsgard (1979), Jones, S.L. (1998), Kennedy (1998), Kennedy & White (1996, 1997), Kroodsma (1972, 1973a, 1973b, 1974, 1985), Miller (1941), Minzenmayer *et al.* (1995), Nehls (1981), Oberholser (1898, 1920a), Phillips *et al.* (1964), Picman (1994), Powers (2001), Price *et al.* (1995), Richardson *et al.* (1998), Ridgway (1904), Root, R.B. (1969), Root, T.L. (1988), Russell & Monson (1998), Skaggs (1934), Slowik & Lane (2001), Small (1994), Smith (1980), Stafford (1983), Taylor, R.V. Taylor (2003), Taylor, W.K. *et al.* (1983), Townsend (1923), Udvardy (1963), Urban (1959), Verner & Purcell (1999), White & Kennedy (1998), Williams (1941), Yard *et al.* (2004).

Genus *FERMINIA* Barbour, 1926

29. Zapata Wren

Ferminia cerverai

French: Troglodyte de Zapata **German**: Kubazaunkönig **Spanish**: Cucarachero de Zapata
Other common names: Cervera's Wren, Cuban Marsh Wren, Fermina Wren

Taxonomy. *Ferminia cerverai* Barbour, 1926, Santo Tomás, Zapata Peninsula, Cuba.

A highly aberrant species, with uncertain affinities. May be most closely related to *Cistothorus* or *Troglodytes*, but in need of much further study, especially of its DNA, to elucidate its true taxonomic relationships. Monotypic.

Distribution. Zapata Swamp, in W Cuba.



Descriptive notes. 15·5–16 cm. Has blackish-brown crown feathers finely edged paler brown; side of face mottled brownish-buff, inconspicuous eyestripe; upperparts dark brown with blackish bars, lateral bars extending across wing-coverts and flight-feathers; rectrices long, with diffuse fluffy ends, blackish-brown with fine greyish-brown lateral bars; chin pale whitish-buff, chest more brown, flanks darker brown, lower flanks with prominent transverse blackish bars; thighs and vent brownish, diffusely barred darker brown; eyes clear brown; bill dark brown above, paler yellow-brown below; legs brownish. Sexes similar. Juvenile is like adult, but with fine black speckles on throat, diffuse blackish-brown speckles and flank barring less distinct. Voice. Male song a series of 4–7 clear gurgling whistles interspersed with harsher churring notes, often continuing for a minute or more; female song, often in duet with that of male, is simpler, resembling extended series of call notes, "achut-chut-chut-chut-churr". Calls include low harsh "chut chut", "churr-churr" etc.

Habitat. Restricted to savanna-type swamp, where dominant vegetation sawgrass (*Cladium jamaicense*) and *Typha dominguensis*, with scattered bushes (used as songposts). Water level is variable, with standing water in rainy season but not during dry season.

Food and Feeding. Diet quite varied. Mainly invertebrates, including e.g. beetles (Coleoptera), bugs (Hemiptera), crickets (Orthoptera), caterpillars (Lepidoptera), spiders (Araneae); also slugs, snails and snail eggs. Frogs eaten, also small *Anolis* lizards, including one specimen c. 10 cm long. Some vegetable matter, including lichen and the seeds of *Chrysbalanus hicacus*. Feeds low down in vegetation, and quite frequently on the ground, scratching in search of prey.

Breeding. Poorly known; first nest discovered in 1986, and total of only five described. Season apparently protracted, specimens with enlarged testes in Jan, eggs at end of Feb, and nests with well-feathered young on 2nd May and 12th Jun; possibly double-brooded. Nest, built by both sexes, a ball of sawgrass leaves c. 20 cm tall, external diameter c. 14 cm, side entrance c. 4·1–4·3 cm wide, interior lined with feathers, situated c. 20–70 cm above ground in sawgrass. Clutch 2 eggs, unmarked white; incubation by female alone, no information on duration of incubation and fledging periods; both sexes attend fledglings.

Movements. Sedentary.

Status and Conservation. ENDANGERED. Restricted-range species: present in Cuba EBA. Has always been confined to a small area of the Zapata Swamp. Following its discovery, in 1926, was

On following pages: 30. Carolina Wren (*Thryothorus ludovicianus*); 31. White-browed Wren (*Thryothorus albinucha*); 32. Black-throated Wren (*Thryothorus atrogularis*); 33. Sooty-headed Wren (*Thryothorus spadix*); 34. Black-bellied Wren (*Thryothorus fasciatoventris*); 35. Plain-tailed Wren (*Thryothorus euophrys*); 36. Inca Wren (*Thryothorus eisenmanni*); 37. Moustached Wren (*Thryothorus genibarbis*); 38. Whiskered Wren (*Thryothorus mystacalis*).

believed to be quite common in its tiny range, a situation that prevailed until at least 1962. It then appeared to decline, and several expeditions failed to locate it, leading to fears that it was extinct; these searches, however, were conducted around the type locality, which had been extensively burnt, while other areas were not explored. More recently, this species has been rediscovered, and small additional populations, totalling c. 24 individuals, have been found in a new location several kilometres N of the traditional sites. Recent estimates suggest total population of c. 120–140 pairs, quite extensively distributed in the swamp; population density apparently low, and not all seemingly suitable habitat occupied. Main threats to its survival are the burning of grass, sometimes accidental, sometimes deliberate, to facilitate the hunting of edible terrapins (Emydidae); also possible predation by introduced mongooses (Herpestidae). A management plan for the area, which would also benefit the Zapata Rail (*Cyanolimnas cerverai*) and the local, nominate race of Zapata Sparrow (*Torreornis inexpectata*), is in preparation.

Bibliography. Abreu *et al.* (1999), Anon. (1998b), Barbour (1926, 1928), Bond (1985), Bruner (1934), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Fitzpatrick (2002), Forneris & Martínez (2003), Garrido (1980, 1985), Garrido & García (1975), Garrido & Kirkconnell (2000a), González (1982), Gundlach (1873), Hellmayr (1934), King (1978/79), Kirkconnell *et al.* (1999), Llanes & Mancina (2002), Martínez & Martínez (1991), Morton (1979), Raffaele *et al.* (1998, 2003), Soto *et al.* (1993), Stattersfield & Capper (2000).

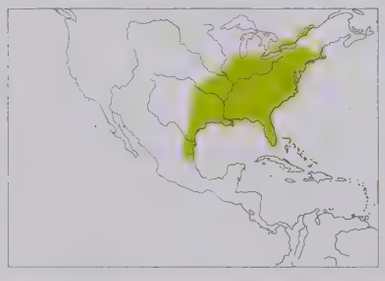
Genus *THRYOTHORUS* Vieillot, 1816

30. **Carolina Wren**

Thryothorus ludovicianus

French: Troglodyte de Caroline **Spanish**: Cucarachero de Carolina
German: Carolinazaunkönig
Other common names: Mocking Wren

Taxonomy. *Sylvia ludoviciana* Latham, 1790, Louisiana.
Traditionally placed in present genus as its only North American representative; recent DNA work, however, suggests that it may be more closely allied with *Thryomanes*. Often considered to include *T. albinucha* as a geographically disjunct race, a view supported by recent observations of similarities in song. Proposed race *oberholseri* (occurring in CS Texas and possibly adjacent parts of Mexico) rather puzzling, said to be more rufescent than *lomitensis* but plumage is variable; perhaps a variant of latter and probably not worthy of recognition. Seven subspecies recognized.
Subspecies and Distribution.
T. l. ludovicianus (Latham,1790) – SE Canada (S Ontario, irregularly E to S Quebec) and E USA (S Wisconsin and New England S to Texas and N Florida).
T. l. miamensis Ridgway, 1875 – Florida S from c. 30° S.
T. l. nesophilus Stevenson, 1973 – Dog I, off NW Florida.
T. l. burleighi Lowery, 1940 – islands of Cat, Ship and Horn, off Mississippi coast.
T. l. lomitensis Sennett, 1890 – Texas and extreme NE Mexico (N Tamaulipas).
T. l. berlandieri S. F. Baird, 1858 – NE Mexico (E Coahuila, Nuevo León, SW Tamaulipas).
T. l. tropicalis Lowery & Newman, 1949 – NE Mexico (E San Luis Potosí, S Tamaulipas).



Descriptive notes. 12·5–14 cm; 15–22 g. Nominate race has conspicuous white supercilium narrowly bordered above and below with black; brown stripe behind eye; ear-coverts dull white to pale buff, with dusky edging; crown and back rich brown, becoming chestnut-brown on rump; shoulders and greater upperwing-coverts warm rich brown, small white spots on lesser primary coverts; primaries and secondaries warm brown with dark brown barring; rectrices colder brown than rump, narrowly barred dark brown; chin and throat dull whitish, chest buff, flanks and lower belly rich warm buff; eye red-brown; bill grey-brown with yellowish base; legs flesh-coloured. Distinguished from all other North American wrens by large size, prominent white supercilium, rich brown upperparts. Sexes similar. Juvenile is generally paler than adult, buff tips on wing-coverts. Race *miamiensis* is larger than nominate, darker above and below; *nesophilus* has whiter supercilium and paler underparts; *burleighi* has duller and more sooty upperparts, less distinct tail barring; *berlandieri* is smaller than nominate, but with larger bill, duller above, and with flanks sometimes barred dusky; *lomitensis* is similar to previous but duller above and paler below, flanks frequently barred; *tropicalis* is darker above than last two, tail heavily barred. Voice. Male repertoire of c. 30 different songs, each a loud, ringing, emphatic "tea-kettle tea-kettle tea-kettle" or "liberty-liberty-liberty", or similar phonetic rendition; delivers a series of one song before switching to another. Female not known to "sing" in complex fashion of male (or of tropical female congeners), instead utters a dry, non-learned rattle as male sings.
Habitat. Very varied. Natural habitats include woodlands of hardwoods, such as oak (*Quercus*), and mixed coniferous–hardwood forests. Common also in forest edge, well-vegetated suburban areas, abandoned farmland; frequently in wet bottomland. Island races *nesophilus* and *burleighi* found in palmetto and slash pine (*Pinus elliottii*). Sea-level to middle elevations; to 2000 m in Mexico.
Food and Feeding. Bulk of food invertebrates, including beetles (Coleoptera), bugs (Hemiptera) and grasshoppers (Orthoptera); small vertebrates such as tree-frogs, lizards and, rarely, small snakes also taken. Some vegetable matter, e.g. seeds, fruit pulp, eaten. N populations frequently patronize feeding stations, where suet a popular food. Forages usually in pairs or family parties, mostly in lower levels of dense vegetation. Will forage in leaf litter, turning over debris in search of prey; occasionally "tree-creeps" while probing into crevices of bark. Has been seen to wedge hard-coated seeds in crannies and to hammer them open in manner of a nuthatch (*Sitta*).
Breeding. Egg-laying starts in May in Canada (Ontario), earlier farther S (from late Mar in Tennessee); may be triple-brooded, nesting continuously until Aug, in S USA; no data on Mexican populations. Usually monogamous, partners remaining faithful for several years, but one observation of possible polygamy; territory maintained throughout year, usually by a pair, sometimes by a single male. Bulk of nest-building by male, sometimes bringing material to female, which adds it to the structure; nest a substantial domed structure with side entrance, built of dried grass, bark strips, horsehair etc., as well as with debris such as string and cast snakeskins, lined with finer material; usually located 1–3 m up, rarely to 10 m, in partial or complete cavity, including artificial sites such as nestbox, cavity in shed, tin can and even bizarre situations such as in pocket of a hung-up jacket, also occasionally in hole in bank or similar site; nests in totally enclosed sites may lack roof. Clutch 3–6 eggs, 5 most common in Tennessee, 4 in Alabama, eggs white or cream with brown or reddish-brown spots, especially around blunt end; incubation by female alone, fed on nest by male, period 12–16 days, average 14·8 days; young fed by both sexes, fledging period 12–14 days. Nests frequently parasitized (up to 25% of nests) by Brown-headed Cowbird (*Molothrus ater*).
Movements. Largely sedentary; ringing studies show that, in most cases, territory is occupied throughout year by the same pair. Some apparent wandering, possibly by juveniles; although great majority of ringing returns show little or no movement, some distant recoveries recorded, greatest of which involved a juvenile ringed in coastal Massachusetts (USA) and recovered six weeks later in New Hampshire, 250 km away. Furthermore, a substantial number of extralimital records in such diverse locations as E New Mexico and Colorado, S Manitoba, Nova Scotia and La Madeleine Is (Gulf of St Lawrence).
Status and Conservation. Not globally threatened. Generally common over much of range. N populations fluctuate widely, both in numbers and in extent of distribution, in response to severe winters; total Ontario population in period 1981–1985 was only a few dozen pairs, but much more numerous and widely spread in 2001. Has been very successful in adapting to habitats much modified by human activity.

Bibliography. Abbott (1884), Anon. (1998b), Baicich & Harrison (1997), Beal *et al.* (1916), Bent (1948), Blake (1953), Borror (1956), Brenowitz & Kroodsma (1996), Bystrak (1979), Contreras (1997), Cook (1990), Cyr & Larivée (1995), Eberhardt (1994, 1996), Gaunt *et al.* (1996), Godfrey (1986), Grzybowski (1995), Haggerty & Morton (1995), Haggerty *et al.* (2001), Helgeson (1980), Hellmayr (1934), Howell & Webb (1995), Hyland *et al.* (2000), Hyman (2002), Jawor & Gray (2003), Johnsgard (1979), Kollars *et al.* (2000), Lowery (1940), Marra & Remsen (1997), McAtee (1950), Messerly (1998), Minzenmayer *et al.* (1995), Morton (1982, 1987), Morton & Shalter (1977), Naguib (1996), Nealen & Perkel (2000), Nice & Thomas (1948), Peck & James (1997), Pogue & Grzybowski (1997), Price *et al.* (1995), Ramsey (1987), Richard (1987), Richards (1981), Ridgway (1904), Robinson & Robinson (1999), Root (1988), Rosene (1954), Shuler (1965), Shy & Morton (1986), Simpson (1982, 1984, 1985), Stevenson (1973), Strain & Ronald (1988), Taylor *et al.* (1983), Townsend (1909), Udvardy (1963), Urban (1959), Wiedenfeld *et al.* (1992).

31. **White-browed Wren**

Thryothorus albinucha

French: Troglodyte de Cabot **Spanish**: Cucarachero Cejiblanco
German: Weißbrauen-Zaunkönig
Other common names: Cabot's Wren

Taxonomy. *Troglodytes albinucha* Cabot, 1847, Yalahao, Quintana Roo, Mexico.
Regarded by many authorities as a geographically disjunct race of *T. ludovicianus*, a view supported by recent observations of similarities in song. Recent specimens from Nicaragua not racially assigned, presumed to belong with *subfulvus*. Two subspecies recognized.
Subspecies and Distribution.
T. a. albinucha (Cabot, 1847) – Yucatán Peninsula: E Mexico (Yucatán, Campeche except SW, Quintana Roo), N Guatemala (Petén) and N Belize.
T. a. subfulvus W. deW. Miller & Griscom, 1925 – C Guatemala and W Nicaragua.



Descriptive notes. 11·5–13·5 cm. Nominate race has brown lores and eyestripe, white supercilium, ear-coverts mottled grey and blackish; crown and back dark olive-brown, becoming more rufous on lower back and rump; concealed whitish spots on feathers of lower back; upperwing-coverts medium brown, primaries and secondaries rufescent brown with diffuse darker barring; rectrices blackish-brown, outer feathers with grey bars on tips and outer webs; chin and chest off-white, flanks buffy brown, occasionally with obscure barring, crissum barred blackish and white; eye brownish-red; bill dark yellowish-brown, base paler; legs flesh-coloured. Distinguished from generally similar *T. ludovicianus* by more olive, less rufous, upperparts, much paler underparts, usually no flank barring. Sexes similar. Juvenile undescribed. Race *subfulvus* is more cinnamon on underparts than nominate, and with indistinct bars on flanks. Voice. Song a series of loud whistles and gurgles, apparently very similar to that of *T. ludovicianus*; reported as responding to playback of song of latter. Calls include querulous descending buzzy trill, which also occurs in song; buzzing churrs as alarm.
Habitat. Dry scrub and forest; in S Yucatán more humid forest. In Nicaragua dry thorn-scrub, as well as semi-deciduous broadleaf forest.
Food and Feeding. No published data available on food items. Forages mostly in lower levels of scrub.
Breeding. No information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in parts of range in Mexico, where large areas of suitable habitat remain. No information on populations farther S. In W Nicaragua, race *subfulvus* known from a single confirmed specimen, but recent specimens from this region presumed to involve same taxon; apparently occurs also in arid C Guatemala, but litle information available.

Bibliography. Blake (1953), England (2000), Hellmayr (1934), Howell & Webb (1995), Klaas (1968), Land (1970), Lee Jones (2004), Lowery & Berrett (1963), Martínez-Sánchez (1989), Miller & Griscom (1925), Ridgway (1904), Smithe (1966), Tramer (1974), Van Tyne (1935).

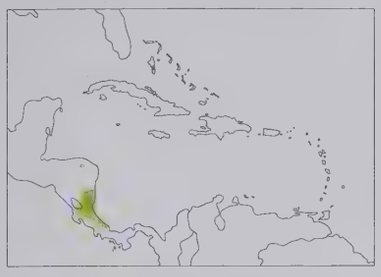
32. **Black-throated Wren**

Thryothorus atrogularis

French: Troglodyte à gorge noire **Spanish**: Cucarachero Gorginegro
German: Schwarzkehl-Zaunkönig
Other common names: Northern Black-throated Wren

Taxonomy. *Thryothorus atrogularis* Salvin, 1865, Tucurriquí, Costa Rica.
Formerly regarded as conspecific with *T. spadix*, but the two are quite distinct in plumage and song and are widely separated geographically. Monotypic.

Distribution. Caribbean lowlands and foothills in SE Nicaragua (S from about San Juan del Norte), Costa Rica (extending W to Pacific slope on some volcanoes), and W Panama (W Bocas del Toro); recently found also in E Honduras.



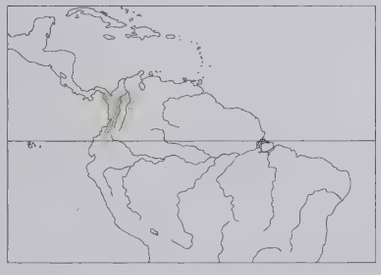
Descriptive notes. 15 cm; male 24·3–27·3 g, female 22·5 g. A very dark, black-throated wren, in plumage rather reminiscent of some antbirds (Formicariidae). Lores and ear-coverts are black with some white markings; crown and upperparts deep reddish-brown, more rufescent on rump; primaries and secondaries uniform dark reddish-brown; rectrices blackish-brown, inconspicuous buffy markings on outer webs of lateral feathers; chin, throat and upper chest black, interspersed with reddish-brown on central chest; lower chest and belly reddish-chestnut, undertail-coverts black with fine white transverse bars; eye reddish-brown; bill grey to black; legs blackish or dark brown. Sexes similar. Juvenile is more uniform and much duller than adult, upperparts dull dark brown, white streaks on ear-coverts absent, throat dull blackish-brown, not contrasting sharply with lower chest, no white bars on undertail-coverts. Voice. Song a distinctive series of rich whistles ending in a trill which may be pitched higher or lower than preceding phrases; female often adds a series of notes at end of a phrase. Call a fast, nasal to wooden rattling "praaaaht", and guttural rolling "beewr" or "bweeurr".
Habitat. Lowland and foothill forest, especially regenerated clearings and other second growth; frequently associated with water, although less so than *T. nigricapillus*.
Food and Feeding. Few data on food; appears to be mainly insects and spiders. Forages usually low down in tangled vegetation, often in pairs.
Breeding. Season in Costa Rica apparently Apr/May–Aug. No other information.
Movements. Appears to be sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Central American Caribbean Slope EBA. Locally common in Costa Rica and W Panama; only recently discovered in E Honduras, where status uncertain. Some parts of range protected in national parks and other reserves.
Bibliography. Angehr (2003), Anon. (1998b), Blake & Loiselle (1991), Hellmayr (1934), Ridgely & Gwynne (1989), Slud (1960, 1964), Stiles & Skutch (1989), Wetmore *et al.* (1984).

33. **Sooty-headed Wren**

Thryothorus spadix

French: Troglodyte moine **German**: Rußkopf-Zaunkönig **Spanish**: Cucarachero Cabecigrís
Other common names: Southern Black-throated Wren, Smoky-headed Wren

Taxonomy. *Pheugopedius spadix* Bangs, 1910, Naranjito, River Dagua, Valle, Colombia.
Formerly regarded as conspecific with *T. atrogularis*, but the two are quite distinct in plumage and song and are widely separated geographically. Two subspecies recognized.
Subspecies and Distribution.
T. s. xerampelinus Griscom, 1929 – Pacific slope of extreme E Panama (Darién).
T. s. spadix (Bangs, 1910) – Pacific lowlands of Colombia from Chocó S to Nariño, in N also extending E to middle Magdalena Valley (in Santander).



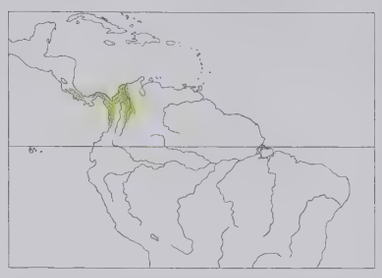
Descriptive notes. 14·5 cm. Nominate race has black lores with some white markings, black ear-coverts conspicuously streaked white; crown dull blackish, back, shoulders, upperwing-coverts and rump bright chestnut; primaries and secondaries bright chestnut on exposed webs; rectrices chestnut-brown with conspicuous lateral black bars; chin and throat black with some white feathers below angle of bill, contrasting strongly with bright chestnut lower throat and chest; lower chest and belly duller, centre of belly greyish-brown with darker mottling; eye brown; upper mandible blackish-grey, lower mandible blue-grey; legs dull grey. Sexes similar. Juvenile is generally duller than adult, with less contrast between crown and throat, and between back and chest. Race *xerampelinus* is paler than nominate, with less reddish-brown on flanks. Voice. Song, production antiphonally by both sexes, a series of c. 6 loud gurgling whistles, with one phrase frequently repeated; lacks the terminal trill of *T. atrogularis*.
Habitat. Humid forest, forest edge and cloudforest, especially areas with heavy moss growth; also dense secondary forest. Mostly 800–1800 m, but down to 400 m in Colombia.
Food and Feeding. Food mostly or entirely invertebrates; stomach contents of Panamanian specimens included beetles (Coleoptera), true bugs (Hemiptera), ants (Hymenoptera), crickets (Gryllidae), caterpillars and spiders (Araneae). Forages low down in vegetation, usually in pairs; does not routinely join mixed flocks. Has been seen to follow the army ant *Laridus predator* in Colombia.
Breeding. Little published information. Season apparently protracted, with nest-building observed in Mar and Dec, eggs in Sept, and breeding-condition adults in C Andes of Colombia from Apr to Sept. Nest a ball of coarse material and leaves, entrance at side; one was placed c. 1 m up in a *Heliconia*. Eggs 2, white, finely spotted with reddish around large end; no information on incubation and fledging periods.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Fairly common in suitable habitat in Colombia. Uncommon in Panama, where occurs in Darién National Park.
Bibliography. Angehr (2003), Anon. (1998b), Chapman (1917), Cracraft (1985), Donegan & Dávalos (1999), Hellmayr (1934), Hilty (1977, 1997), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robbins *et al.* (1985), Stiles *et al.* (1999), Wetmore *et al.* (1984).

34. **Black-bellied Wren**

Thryothorus fasciatoventris

French: Troglodyte à ventre noir **Spanish**: Cucarachero Ventrinegro
German: Bindenbauch-Zaunkönig
Other common names: Band-bellied Wren

Taxonomy. *Thriothorus* [*sic*] *fasciato-ventris* Lafresnaye, 1845, "Bogotá", Colombia.
Three subspecies recognized.
Subspecies and Distribution.
T. f. melanogaster Sharpe, 1882 – SE Costa Rica (S from mouth of Golfo de Nicoya) and W Panama (E to Canal Zone).
T. f. albigularis (P. L. Sclater, 1855) – E Panama (E from Canal Zone) and NW Colombia (Chocó).
T. f. fasciatoventris Lafresnaye, 1845 – NW & C Colombia (E to foothills of Santa Marta Mts, S to lower Cauca Valley and middle Magdalena Valley.



Descriptive notes. 15 cm; mean both sexes 24 g. Nominate race has conspicuous white supercilium, edged with black above, contrasting strongly with crown and with blackish-brown eyestripe; crown rich brown, back and rump richer chestnut-brown; primaries and secondaries less richly coloured, with inconspicuous darker barring; rectrices medium brown with darker transverse bars; chin, throat and chest gleaming white, sharply contrasting black band across lower chest; belly black with conspicuous white bars, becoming buffy on flanks and lower belly; vent barred dull black and grey, thighs dark brown with diffuse darker barring; eye reddish-brown or light brown; bill blackish to greyish, bluish on lower mandible; legs fuscous black. Sexes similar. Juvenile is very different from adult, has dull chestnut upperparts becoming brighter on rump, dull greyish-white throat, dull grey-brown side of chest, brown belly sometimes with very obscure barring, no sharp contrast between chest and belly. Race *albigularis* has darker brown upperparts and less conspicuous white bars on belly than nominate; *melanogaster* is largest, with upperparts richer chestnut and underpart barring much reduced, barring on undertail-coverts light chestnut-brown. Voice. Song a spectacular series of rich, liquid gurgling notes, each phrase of 3–8 notes repeated frequently before changing to different motif; both sexes sing, but not truly antiphonally (songs overlapping to a degree), female song distinctive, being of a higher frequency. Alarm call a low rasping chatter.
Habitat. Humid, dense low-lying vegetation, especially on streambanks and other wet areas; particularly *Calathea* and *Heliconia* thickets in Costa Rica. Sea-level to 500 m in Costa Rica, to 1000 m in Colombia.
Food and Feeding. Little recorded information; food items from stomach contents include insects and spiders (Araneae). Rather solitary, appears not to maintain extended family groups for feeding and does not routinely associate with mixed flocks. Forages especially in low vine tangles close to ground, occasionally up in canopy.
Breeding. Few nests found. Season probably May–Jul in Costa Rica; nest-building in early Feb and birds in breeding condition Mar–Jul in Colombia. Nest (in Costa Rica) a globular structure, with side entrance protected by "visor", made of dry strips of *Heliconia* leaves, situated 1–2 m up in *Heliconia* thicket. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Poorly known; probably uncommon. Density is stated as being low compared with that of others species in genus. Occurs in Darién National Park, in Panama.
Bibliography. Anon. (1998b), Boggs (1961), Chapman (1917, 1936), Cracraft (1985), Haffer (1975), Hellmayr (1934), Hilty (1977), Hilty & Brown (1986), Meyer de Schauensee (1982), Morton (1980), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Ridgway (1904), Robbins *et al.* (1985), Slud (1964), Stiles & Skutch (1989), Wetmore *et al.* (1984), Willis & Eisenmann (1979).

35. **Plain-tailed Wren**

Thryothorus euophrys

French: Troglodyte maculé **German**: Fraserzaunkönig **Spanish**: Cucarachero Coliliso
Other common names: Black-crowned Wren (*atriceps*); Spot-chested Wren (*euophrys*)

Taxonomy. *Thryothorus euophrys* P. L. Sclater, 1860, Lloa, not far south of Quito, Pichincha, Ecuador.
Closely related to, and has been considered to form a superspecies with, *T. eisenmanni*, but differs markedly in song and (especially the races geographically closest to latter) in plumage; neither species responds to playback of the other's song. Four subspecies recognized.
Subspecies and Distribution.
T. e. euophrys P. L. Sclater, 1860 – W Andes of extreme S Colombia (Nariño) and Ecuador.
T. e. longipes J. A. Allen, 1889 – E Andes of Ecuador.
T. e. atriceps (Chapman, 1924) – NW Peru (NE Piura, Cajamarca).
T. e. schulenbergi Parker & O'Neill, 1985 – N Peru S of R Marañón (Amazonas, San Martín).



Descriptive notes. 16 cm; male average 36 g, female average 31·5 g. Nominate race has grey-white supercilium, dull blackish eyestripe; crown dark brownish-grey, nape bright brown, becoming richer chestnut on central back and rump; shoulders and upperwing-coverts chestnut-brown; concealed inner webs of primaries and secondaries blackish-brown, outer webs bright reddish-brown; rectrices plain red-brown; throat dull whitish, black malar stripe, upper chest speckled grey and dull black, lower chest unmarked grey-brown; flanks, lower belly and thighs rich brown; eye light brown; upper mandible dark grey, lower mandible bluish-grey; legs bluish-grey. Sexes similar. Juvenile has crown tinged olive-grey, throat rufous without blackish spots or grey tinge, underparts dull white. Race *longipes* has reduced dark markings on chest, more grey underparts, less white on throat; *atriceps* has blackish crown, even less spotting below; *schulenbergi* is larger and duller than nominate, most similar to previous but crown and nape greyish, supercilium pale greyish, posterior underparts less brown. Voice. Song loud and carrying, a series of varied phrases of loud, gurgling chortling whistles, repeated many times; frequently produced by both sexes antiphonally. Contact call a loud "choo-chip, choo-chip-chip", unlike typical troglodytid calls; also a wheezy "zwee".
Habitat. Dense montane undergrowth, especially thickets of *Chusquea* bamboo. 1850–3500 m, mostly above 2000 m.

Food and Feeding. Little information; diet mostly invertebrates. Forages in pairs, generally low down; plucks insects from undersides of leaves.
Breeding. Season apparently protracted; in Ecuador, juveniles in Jul in NW and in Nov and Jan in NE. Nest and eggs undescribed.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in many locations. Present in a number of protected areas, e.g. Podocarpus National Park (Ecuador). As *Chusquea* bamboo, a preferred habitat, frequently colonizes disturbed areas (e.g. rockslides), some human activity may increase available habitat for this species.
Bibliography. Baez *et al.* (1997), Best *et al.* (1997), Bloch *et al.* (1991), Clements & Shany (2001), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hellmayr (1934), Hilty & Brown (1986), Meyer de Schauensee (1982), Parker & O'Neill (1985), Parker *et al.* (1985), Ridgely & Greenfield (2001), Ridgely & Tudor (1989).

36. Inca Wren

Thryothorus eisenmanni

French: Troglodyte inca **German**: Inkazaunkönig **Spanish**: Cucarachero Inca

Taxonomy. *Thryothorus eisenmanni* Parker and O'Neill, 1985, San Luis, Cuzco, Peru.
Closely related to, and has been considered to form a superspecies with, *T. euophrys*, but differs markedly in song and (especially when compared with geographically closest races of latter) in plumage; neither species responds to playback of the other's song. Monotypic.
Distribution. Cuzco (from Cordillera de Vilcabamba S to valleys of R Santa Marta and R Urubamba), in S Peru.



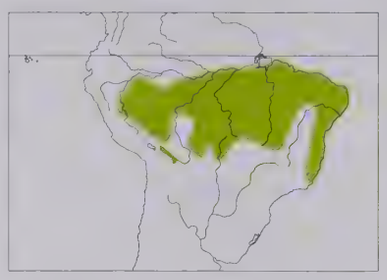
Descriptive notes. 16 cm; male 22–27 g, female 19–23 g. Male has crown, nape, upper half of ear-coverts and lores dull black, broad white supercilium, lower half of ear-coverts white with fine black streaks; remainder of upperparts bright russet, tail duller russet with obscure darker bars, remiges and greater primary coverts blackish-brown with russet-brown edges; most of throat white, dull black submoustachial stripe; breast and upper belly white with bold blackish streaks, flanks and undertail-coverts dull yellow-brown; eye chestnut or reddish-brown; upper mandible dark brown, lower mandible blue-grey or silver-blue with blackish tip; legs greyish-horn or grey-black. Female (on basis of small amount of material available) differs constantly from male, has crown charcoal-grey, rectrices usually unbarred, belly usually unstreaked. Juvenile undescribed. Voice. Song consists of sequences of rapidly repeated chortling whistles, in groups of c. 10 rising and falling notes continuing for a minute or more; sexes sing antiphonally, female song higher-pitched than that of male. Call a sharp "chip-chip-chip".
Habitat. Largely confined to thickets of *Chusquea* bamboo; avoids dense well-shaded forest. 1830–3350 m.
Food and Feeding. Little information. Stomach contents of specimens included small beetles (Coleoptera), caterpillars and cockroaches (Blattodea). Typically forages in pairs or in groups of up to six individuals (possibly family parties), at 0·5–1·5 m above ground. Does not routinely participate in mixed flocks.
Breeding. No information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Bolivian and Peruvian Upper Yungas EBA. Discovered as recently as 1985. Notwithstanding its small range, seems to be fairly common in suitable habitat. As its habitat of *Chusquea* bamboo thrives on artificially disturbed sites, such as roadsides, as well as on naturally disturbed ones, such as rockslides and revegetating landslides, this species may have increased in numbers since its initial discovery.
Bibliography. Clements & Shany (2001), Fjeldså & Krabbe (1990), Parker & O'Neill (1985), Ridgely & Tudor (1989), Vuilleumier *et al.* (1992), Walker (2001).

37. Moustached Wren

Thryothorus genibarbis

French: Troglodyte à moustaches **Spanish**: Cucarachero Bigotudo Brasileño
German: Wangenstreif-Zaunkönig

Taxonomy. *Thryothorus genibarbis* Swainson, 1838, Bahia, Brazil.
Closely related to *T. mystacalis*; treated as conspecific by some authorities, but has quite distinct song and differs also in habitat requirements. Four subspecies recognized.
Subspecies and Distribution.
T. g. juruanus H. von Ihering, 1905 – upper Amazonia in E Peru (Ucayali) and W Brazil (E to R Madeira and upper R Purus), probably also into N & W Bolivia.
T. g. genibarbis Swainson, 1838 – E Brazil from R Madeira E to Atlantic coast (Maranhão S to Espírito Santo).
T. g. intercedens Hellmayr, 1908 – C Brazil (Mato Grosso, Goiás).
T. g. bolivianus (Todd, 1913) – Amazonian Bolivia (N Santa Cruz).
Descriptive notes. 15·5 cm; 16·2–22·8 g. Nominate race has grey-brown lores and black postocular stripe, contrasting white eyering and supercilium; ear-coverts grey-black, conspicuously streaked white; crown and nape olivaceous grey-brown, back, rump and wing-coverts bright chestnut; primaries and secondaries dull blackish-brown on concealed inner webs, chestnut on exposed outer webs; rectrices dull brown with c. 8–10 narrow blackish bars; black malar stripe contrasting with white moustachial stripe; throat and upper chest off-white, lower chest buffy, flanks and belly deeper brown, becoming reddish-brown on undertail-coverts; eye reddish-brown; bill often black but somewhat variable; legs grey. Sexes similar. Juvenile has browner crown than adult, with duller, less chestnut back, less clearly defined facial markings (especially malar stripe), more diffuse bars on tail. Race *juruanus* is generally larger, larger-billed and paler below than nominate; *intercedens* has more slender bill, crown less sooty, no grey tinge on foreneck, somewhat duller underparts; *bolivianus* is closest to previous, but has deeper ochraceous underparts, darker grey on neck side, ashy tinge on foreneck. Voice. Song, often produced antiphonally by pair-members, a series of fast rollicking phrases, frequently repeated, phrases often followed by rapid "cho cho cho"; lacks the slower gurgling quality of *T. mystacalis* song, more closely resembles song of *T. coraya*. Call note a whining "jeeyr", which also occurs in the song.



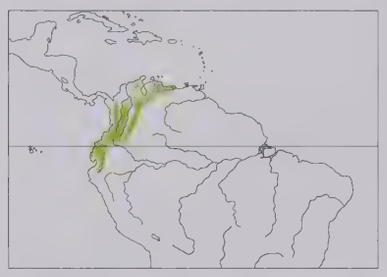
Habitat. Forest edge, including riverine forest, especially dense thickets of *Bambusa* bamboo. Sea-level to middle elevations; to 1500 m in Bolivia.
Food and Feeding. No published information on food items; probably largely or entirely invertebrates. Forages generally low down in vegetation, often in pairs.
Breeding. No information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Fairly common over much of its reasonably extensive range. Suitable habitat is widely distributed and not under excessive threat. Occurs in several protected areas, e.g. Amazonia Lodge, in Peru, and Rio Cristalino Forest Reserve, in Brazil.
Bibliography. Davis (1993), Dubs (1992), Fjeldså & Maijer (1996), Hellmayr (1934), Hennessey *et al.* (2003), Mallet-Rodrigues & Marinho (2003), Meyer de Schauensee (1982), Oren & Parker (1997), Parker & Goerck (1997), Peres & Whittaker (1991), Perry *et al.* (1997), Pinto & Camargo (1961), Ridgely & Tudor (1989), Robinson & Terborgh (1997), Rosenberg (1997), Sick (1993, 1997), Stotz *et al.* (1997), Zimmer *et al.* (1997).

38. Whiskered Wren

Thryothorus mystacalis

French: Troglodyte à favoris **Spanish**: Cucarachero Bigotudo Montano
German: Bartstreif-Zaunkönig
Other common names: Dusky-tailed Wren (*macrurus*)

Taxonomy. *Thryothorus mystacalis* P. L. Sclater, 1860, Pallatanga, Chimborazo, Ecuador.
Closely related to *T. genibarbis*; treated as conspecific by some authorities, but has quite distinct song and differs also in habitat requirements. Eight subspecies recognized.
Subspecies and Distribution.
T. m. consobrinus Madarász, 1904 – Sierra de Perijá and Andes of W Venezuela (S Lara S to Mérida).
T. m. ruficaudatus Berlepsch, 1883 – N Venezuela (C Falcón and Yaracuy E to Miranda).
T. m. tachirensis Phelps, Sr & Gilliard, 1941 – S Táchira (Páramo de Tamá), in SW Venezuela.
T. m. saltuensis (Bangs, 1910) – W & C Andes of Colombia.
T. m. yananchae Meyer de Schauensee, 1951 – E Nariño (Yananchá), in SW Colombia.
T. m. mystacalis P. L. Sclater, 1860 – S Colombia and W Ecuador.
T. m. macrurus J. A. Allen, 1889 – E slope of C Andes and W slope of E Andes, in Colombia.
T. m. amaurogaster (Chapman, 1914) – E slope of E Andes, in Colombia.



Descriptive notes. 16 cm; 29 g (Venezuela). Nominate race has greyish-white supercilium from bill to above central ear-coverts, dull blackish ear-coverts speckled white, dull black lores, off-white crescent under eye; crown greyish-black, nape olivaceous grey, back, shoulders and rump bright chestnut; primaries and secondaries blackish-grey on concealed inner webs, rufescent on outer webs, giving rufescent-brown appearance on closed wing; tertials blackish-grey; rectrices rufescent-brown, barred dull black; chin and throat off-white, prominent black malar stripe edged whitish above; chest grey, becoming olivaceous grey on belly, flanks more rufescent; eye brown; bill black above, silvery grey or grey-brown below; legs grey. Sexes similar. Juvenile is generally duller than adult, less well marked on face, malar stripe largely absent, throat suffused with buff, eye yellowish. Race *saltuensis* is similar to nominate but with more grey chest, clearer grey crown, less distinct tail barring; *yananchae* differs from nominate in having slaty-grey crown; *macrurus* has dingy brown tail with longitudinal barring on rectrices; *amaurogaster* is much darker than nominate, with sooty-brown crown, ochraceous-tawny underparts; *consobrinus* has more slender bill than nominate, buff-tinged supercilium, buffy foreneck and chest; *tachirensis* is darker overall than previous, crown dusky olive, throat white; *ruficaudatus* generally lacks transverse bars on rectrices, has more buff on face than nominate, deep rufous edgings on primaries and secondaries. Voice. Sexes sing in duet, producing a splendid series of loud gurgling whistles, frequently rising or falling in pitch. Call note a deep throaty "bong bong".
Habitat. Dense undergrowth at edge of humid forest and in regenerating clearings; not usually in unbroken forest interior. Mostly 1200–2400 m, sometimes to 2800 m; locally down almost to sea-level in Ecuador.
Food and Feeding. No information on food. Forages in pairs, from ground level up to 10–12 m, often in *Heliconia* thickets.
Breeding. Season appears to be quite protracted, from late Dec, with nest-building still observed in May. Nest a large ball c. 20 cm in diameter, side entrance, made of roots and grass, located at height of 0·3–6·5 m in fork of small tree or in ferns. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common over much of its range. Occurs in several protected areas, including e.g. Macarao National Park, in Venezuela, and Río Palenque Science Centre, in Ecuador.
Bibliography. Allen (1998), Beebe (1949), Best *et al.* (1997), Chapman (1917), Fjeldså & Krabbe (1990), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Kirwan & Marlow (1996), López *et al.* (2000), Miller (1963), Pople *et al.* (1997), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Wetmore (1939).

PLATE 39 ➤



PLATE 39

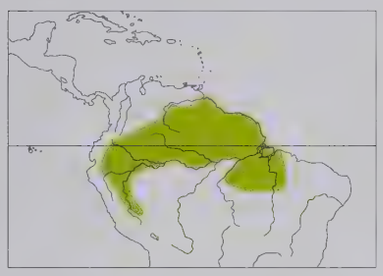
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39. Coraya Wren

Thryothorus coraya

French: Troglodyte coraya **German**: Corayazaunkönig **Spanish**: Cucarachero Coraya

Taxonomy. *Turdus coraya* J. F. Gmelin, 1789, Cayenne, French Guiana.
Substantial vocal and plumage differences between lowland and highland populations in Venezuela suggest the possibility that more than one species are involved. Ten subspecies recognized.
Subspecies and Distribution.
T. c. ridgwayi Berlepsch, 1889 – E Venezuela (S Delta Amacuro, E Bolívar) and W Guyana (W of R Essequibo).
T. c. coraya (J. F. Gmelin, 1789) – Guyana (E of R Essequibo), Suriname, French Guiana and adjacent N Brazil (E of Manaus).
T. c. caurensis Berlepsch & Hartert, 1902 – E & SE Colombia, S Venezuela (S Bolívar, S Amazonas) and N Brazil (E to Manaus).
T. c. obscurus J. T. Zimmer & Phelps, Sr, 1947 – Auyán-tepui, in E Bolívar (E Venezuela).
T. c. barrowcloughianus Aveledo & Pérez, 1994 – tepuis of SE Bolívar (Roraima, Cuquenán), in SE Venezuela.
T. c. griseipectus Sharpe, 1882 – E Ecuador, NE Peru (N of R Marañón) and adjacent extreme W Brazil.
T. c. albiventris Taczanowski, 1882 – N Peru (E slopes of Andes in San Martín).
T. c. amazonicus Sharpe, 1882 – E Peru S of R Marañón (S Loreto S to Huánuco).
T. c. cantator Taczanowski, 1874 – C Peru (E Junín).
T. c. herberti Ridgway, 1888 – N Brazil S of Amazon (from R Tapajós E to R Tocantins and W Maranhão).



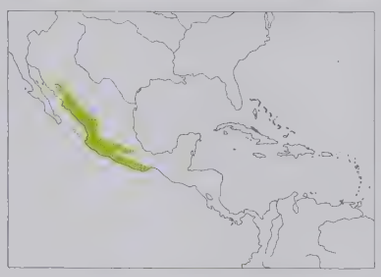
Descriptive notes. 14·5 cm; mean 23·8 g. Nominate race has face, including lores and ear-coverts, black with variable amounts of white markings, white supercilium; crown blackish-brown, upperparts deep reddish-brown, somewhat paler and more rufous on rump; primaries and secondaries greyer than back, rectrices brownish-black with pale grey-brown bars; chin and throat white, chest buff, becoming buffish-brown on belly; undertail-coverts reddish-brown with black bars; eye brown or orange-brown; bill blackish, grey base; legs bluish-grey. Distinguished from other members of genus by combination of heavy markings on face, plain white throat and unpatterned underparts. Sexes similar. Juvenile is very different from adult, has black on side of face replaced by dull blackish-grey, with white markings indistinct, back and rump much less rufescent, throat and chest dull grey, warm colours on belly much reduced, iris greyish-brown. Race *ridgwayi* has underparts deep ochraceous to bright brown; *griseipectus* has bright rufous upperparts, pale grey chest, dark rufescent-brown flanks; *caurensis* is similar to previous, but paler on flanks; *obscurus* resembles last, but with more rufous underparts; *barrowcloughianus* has bright chestnut upperparts; *herberti* has more extensive black on side of face, unbarred uppertail-coverts; *albiventris* is nearly white on middle of breast and abdomen, with reduced brown on flanks; *amazonicus* is similar to nominate, but lighter and less chestnut above, less rufescent flanks; *cantator* resembles last, but supercilium reduced and white streaks on side of head lacking, has almost solid black ear-coverts, and tailbars bright cinnamon-brown (not dull brownish-grey). Voice. Song, by both sexes in duet, a loud, prolonged and varied medley of bubbles and whistles; call a characteristic "chidip chidip choopee".
Habitat. Humid forest and second growth, especially along riverbanks, including both *várzea* and *terra firme*. Generally lowlands, from sea-level to 500 m; locally to 1850 m, and occasionally to 2400 m, on Venezuelan tepuis.
Food and Feeding. Stomach contents include spiders (Araneae), beetles (Coleoptera) and orthopterans (Locustidae); also some seeds. Forages in vegetation from ground level to several metres up; frequently associates with antwrens and antbirds (Thamnophilidae).
Breeding. Little known; only two nests described. Breeding occurs over much of year in the Guianas, eggs noted on 25th Feb, newly fledged juveniles from mid-Jan to late Apr, nest construction in mid-Jul and an occupied nest in late Sept. Nest, built by both sexes, an ovoid ball of twigs and dead leaves, one in a bush and other on top of a mossy tree stump, 3–4 m above ground. Eggs 2, rosy white with fine dark speckles, especially at thick end; no information on incubation and fledging periods.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Widespread, and in many areas quite common. Appears able to colonize second growth and moderately disturbed areas. Occurs in several protected areas, e.g. Canaíma National Park, in Venezuela.
Bibliography. Bangs & Penard (1918), Best *et al.* (1997), Bloch *et al.* (1991), Chapman (1931), Cohn-Haft *et al.* (1997), Cracraft (1985), Friedmann (1948), Gilliard (1941), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Mayr & Phelps (1967), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Novaes (1974), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Sick (1993, 1997), Snyder (1966), Tostain *et al.* (1992), Willard *et al.* (1991).

40. Happy Wren

Thryothorus felix

French: Troglodyte joyeux **German**: Buntwangen-Zaunkönig **Spanish**: Cucarachero Feliz

Taxonomy. *Thryothorus felix* P. L. Sclater, 1860, Juquila, Oaxaca, Mexico.
In past, suggested as possibly conspecific with *T. maculipectus*. Six subspecies recognized.
Subspecies and Distribution.
T. f. sonorae (van Rossem, 1930) – S Sonora and N Sinaloa, in NW Mexico.
T. f. pallidus Nelson, 1899 – C Sinaloa and W Durango S to Jalisco and NW Michoacán.
T. f. lawrencii Ridgway, 1878 – María Madre I (Tres Marías Group), off Nayarit (W Mexico).
T. f. magdalenae Nelson, 1898 – María Magdalena I (Tres Marías Group).
T. f. grandis Nelson, 1900 – drainage of R Balsas (S México, Morelos, SW Puebla, N Guerrero), in W Mexico.
T. f. felix P. L. Sclater, 1860 – SW Mexico from SE Jalisco S to W Oaxaca.



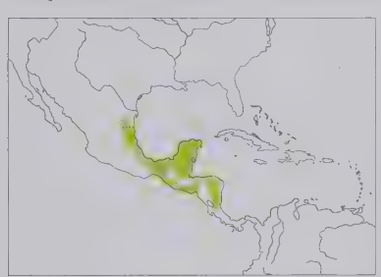
Descriptive notes. 12·5–14 cm; 9–16·4 g. Nominate race has white supercilium, contrasting black sides of face and of neck with prominent white markings; crown and upper back deep reddish-brown, becoming paler on lower back; shoulders, primaries and secondaries rufous-brown, rectrices brown to greyish-brown with darker bars; throat whitish, narrow black malar stripe; underparts warm buff; eye dark brown; bill black, grey base; legs dark grey. Distinguished from *T. sinaloa* by well-defined facial pattern, buff underparts. Sexes similar. Juvenile is similar to adult, but facial markings more diffuse, underparts tinged greyish. Race *sonorae* is much paler than nominate, with pure white chin and throat; *pallidus* is smaller and paler than nominate; *lawrencii* is similar to previous but still paler, with less strongly marked cheeks; *magdalenae* also has obscure face markings but is generally darker than last; *grandis* is intermediate in coloration between nominate and *pallidus* but larger than both. Voice. Song an arresting series of rollicking, gurgling whistles, delivered antiphonally by both sexes, each providing constant phrases that differ from those of the other. Frequently mutually territorial with *T. sinaloa*, each species reacting to the other's song (territories do not overlap); on Tres Marías Is, where latter species absent, local races (*lawrencii* and *magdalenae*) have less song variation than do mainland races.
Habitat. Dry tropical forest, including thorn-forest, and oak–hornbeam (*Quercus–Carpinus*) woodland; also in disturbed habitat and second growth. Sea-level to 2000 m.
Food and Feeding. Mostly invertebrates, including beetles (Coleoptera), caterpillars, bugs (Hemiptera), hymenopterans and others; some vegetable matter, including fruit. Forages low down, from ground to about 2 m, occasionally higher, to 10 m.
Breeding. Breeds late May and Jun, island populations (*lawrencii* and *magdalenae*) several weeks later. Nest a retort-shaped bag of grass, fibres and similar material, built over a twig so that entrance hangs over one side and pouch over the other; frequently sited next to wasp nest, or in acacia (*Acacia*) defended by the aggressive symbiotic ant *Pseudomyrmicus*, which provide protection from terrestrial predators; c. 3 m up, occasionally as high as 18 m, rarely on ground (ground-nesting more frequent in island races). Usually 5 eggs, unmarked bluish-white; no information on incubation and fledging periods.
Movements. Mostly sedentary; some evidence of vertical movements by higher-altitude populations at N edge of range.
Status and Conservation. Not globally threatened. Quite common over much of its range. Appears to be able to tolerate substantial habitat disturbance.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Binford (1989), Blake (1953), Brown (1977), Brown & Lennon (1979), Forcey (2002), Grant (1966a, 1966b), Hellmayr (1934), Howell & Webb (1995), Hutto (1980), Peterson, Escalona *et al.* (2003), Ridgway (1904), Rowley (1966), Short (1974), Stager (1957).

41. Spot-breasted Wren

Thryothorus maculipectus

French: Troglodyte à poitrine tachetée **Spanish**: Cucarachero Pinto
German: Fleckenbrust-Zaunkönig

Taxonomy. *Thriothorus* [*sic*] *maculipectus* Lafresnaye, 1845, Veracruz, Mexico.
Sometimes treated as conspecific with *T. rutilus* and *T. sclateri*, despite great differences in plumage and vocalizations; in past, suggested as possibly being conspecific with *T. felix*. Proposed races *varians* (Pacific slope from Chiapas, in S Mexico, S to El Salvador) and *petersi* (N Honduras S to N Costa Rica) are considered indistinguishable from *umbrinus*. Four subspecies currently recognized.
Subspecies and Distribution.
T. m. microstictus (Griscom, 1930) – NE Mexico (SE Nuevo León and C Tamaulipas S to E San Luis Potosí and N Veracruz).
T. m. maculipectus Lafresnaye, 1845 – E Mexico (Veracruz S to Puebla and N Oaxaca).
T. m. canobrunneus Ridgway, 1887 – SE Mexico (Yucatán Peninsula), N Belize and N Guatemala (N Petén).
T. m. umbrinus Ridgway, 1887 – S Mexico (NE Oaxaca, Tabasco, Chiapas), S Belize, Guatemala (except Petén), El Salvador, N & S Honduras, and Caribbean slope of Nicaragua and N Costa Rica.



Descriptive notes. 12·5–14 cm; male 14·3–16·8 g, female 12·4–16·2 g. Nominate race has white supercilium, sides of face and of neck streaked black and white; crown and upperparts reddish-brown, becoming more chestnut on rump; primaries and secondaries very obscurely barred darker; rectrices dull brown with narrow dark bars; whitish-grey below, prominently spotted black on throat, chest and centre of belly, unspotted orange-buff on lower belly and flanks; eye red-brown; bill blackish; legs blue-grey. Differs from *T. rutilus* in heavily spotted chest, from *T. sclateri* in much warmer-coloured back. Sexes similar. Juvenile is much more obscurely and less extensively marked on face and underparts. Race *microstictus* is less rufescent above than nominate, with smaller and less profuse chest spots; *umbrinus* is larger and generally darker; *canobrunneus* is paler than nominate, with light cinnamon-buff crown. Voice. Song a cheerful series of clear whistling gurgles, given by both sexes antiphonally, male's section consisting of 5–7 notes, female's of 2–4.
Habitat. Quite varied, including disturbed and regenerating habitats. Forest and forest edge, as well as cocoa and citrus plantations. Occurs in both dry forest on limestone and more humid coastal forest. Sea-level to 1300 m in Mexico and Honduras; to only 200 m in Costa Rica.

On following pages: 42. Rufous-breasted Wren (*Thryothorus rutilus*); 43. Speckle-breasted Wren (*Thryothorus sclateri*); 44. Bay Wren (*Thryothorus nigricapillus*); 45. Riverside Wren (*Thryothorus semibadius*).

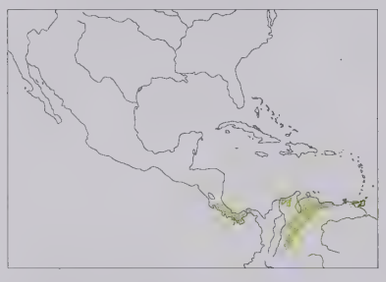
Food and Feeding. Little information on food, probably predominantly invertebrates. Forages usually in pairs or family parties, low down in tangled vegetation.
Breeding. Mar–Jul in Mexico and Apr–Jul in Costa Rica. Nest dome-shaped with side entrance, overall dimensions c. 10 cm × 15 cm, entrance hole c. 4 cm in diameter and without tunnel, typically 1–6 m above ground level in crotch of tree or in ferns, once in hanging flower basket. Eggs 3–4, white with heavy reddish-brown streaks or blotches; no information on incubation and fledging periods; young fed by both sexes.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Frequently quite common. Appears able to make use of moderately disturbed habitat. Occurs in several protected areas, e.g. Blue Hole National Park, in Belize.
Bibliography. Anon. (1998b), Bangs (1903), Binford (1989), Blake (1953), Brodkorb (1943), Contreras (1997), González-García (1993), Hellmayr (1934), Howell, S.N.G. & Webb (1995), Howell, T.R. (1957), Klaas (1968), Komar & Domínguez (2001), Land (1970), Lee Jones (2004), Meyer de Schauensee (1982), Miller (1995), Monroe (1968), Paynter (1955, 1957), Rowley (1984), Russell (1964), Skutch (1940), Smithe (1966), Stiles & Skutch (1989), Tashian (1952), Van Tyne (1935), Waide (1980), Wetmore (1943), Winker *et al.* (1996).

42. **Rufous-breasted Wren**

Thryothorus rutilus

French: Troglodyte des halliers **German**: Rotbrust-Zaunkönig **Spanish**: Cucarachero Pechirrufo
Other common names: Bush Wren, Speckled Wren, (Trinidad) Jungle Wren

Taxonomy. *Thryothorus rutilus* Vieillot, 1819, "l'Amérique septentrionale" = Trinidad.
Sometimes treated as conspecific with *T. maculipectus* and *T. sclateri*, despite great differences in plumage and vocalizations. Seven subspecies recognized.
Subspecies and Distribution.
T. r. hyperythrus Salvin & Godman, 1880 – Pacific slope of Costa Rica and W Panama (E to R Chepó, in Darién).
T. r. laetus Bangs, 1898 – N Colombia (Santa Marta, Magdalena) and extreme NW Venezuela (Perijá Mts).
T. r. rutilus Vieillot, 1819 – N & W Venezuela (coastal mountains from Falcón E to Sucre and Monagas, both slopes of Andes from NW Lara S to Táchira) and Trinidad.
T. r. tobagensis (Hellmayr, 1921) – Tobago.
T. r. intensus (Todd, 1932) – SW Venezuela (NW Táchira).
T. r. interior (Todd, 1932) – W slope of E Andes (Lebrija Valley, in Santander), in Colombia.
T. r. hypospodius Salvin & Godman, 1880 – E slope of E Andes of Colombia (Boyacá, Meta).



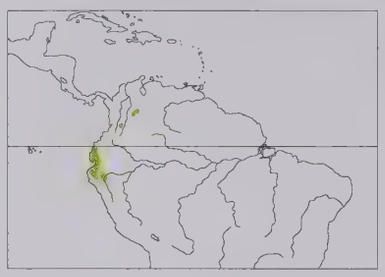
Descriptive notes. 14 cm; 13·5–18·5 g. Distinctive. Nominate race has white supercilium edged black above, face and throat conspicuously marked with black and white speckles; crown and upperparts warm brown, primaries and secondaries duller and very obscurely barred; tail grey-brown, heavily barred blackish-brown; bright chestnut-brown chest sharply demarcated from throat, rest of underparts duller chestnut, centre of belly greyish-white; eye light reddish-brown; bill black, bluish-grey base; legs grey. Sexes similar. Juvenile is generally duller than adult, with facial pattern less sharply defined. Race *hyperythrus* is similar to nominate, but some blackish spots on chest; *laetus* resembles previous but underpart colours richer and warmer; *hypospodius* has tawny colour restricted to chest, flanks duller, upperparts more rufescent, crown deeper rufous; *interior* is paler below, with yellow-ochre breast, pale olive-brown flanks; *intensus* is more richly coloured below than nominate, often with some dark spotting; *tobagensis* has heavier and stronger bill, longer wings and duller chest than nominate. Voice. Sexes sing antiphonally; male may also sing on his own, or the sexes may duet. Considerable geographical variation in song; in Central America, male song 4–7 pure, clear whistles, female 3–4 weaker notes; by contrast, one song type in Venezuela consists of clear whistles mixed with trills. Immatures have different song, rambling and undeveloped, which with time includes some of the clear notes of adult. Call notes churring and raspy, resembling sound made by running one's fingernails over a comb.
Habitat. Rainforest and cloudforest, thickets, second growth and forest edge; not usually in interior of dense forest. Sea-level to 1900 m.
Food and Feeding. Recorded prey items include beetles (Coleoptera), bugs (Hemiptera), flies (Diptera) and hymenopterans; occasionally small seeds. Forages in pairs or in family groups, usually low down in tangles of vegetation, but sometimes quite high in trees.
Breeding. Season Jan–Jul in Costa Rica and Trinidad, and Dec–Jul in Colombia. Nest, built by both sexes, a bulky domed structure with sides c. 13 × 15 cm and 13 cm high, made of grasses, bamboo leaves and dry stalks, lined with finer material and seed down, located 10 cm to as much as 12 m above ground in vegetation tangle. Clutch 2–3 eggs in Central America, 2–4 in Trinidad, eggs white with brown spots, especially at blunt end; incubation by female alone, period c. 18 days; nestlings fed by both parents, fledging in c. 16 days.
Movements. Appears to be totally sedentary.
Status and Conservation. Not globally threatened. Common in suitable habitat over much of its range. Occurs in a number of protected areas, including e.g. Alexander Skutch Private Reserve, in Costa Rica, Isla de Salamanca National Park, in Colombia, and Henri Pittier National Park, in Venezuela.
Bibliography. Anon. (1998b), Blake (1958), Cracraft (1985), ffrench (1986, 1991), Friedmann & Smith (1955), Hellmayr (1934), Herklots (1961), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Skutch (1960, 1985b), Slud (1964), Snow (1985b), Stiles & Skutch (1989), Wetmore *et al.* (1984), White (2002).

43. **Speckle-breasted Wren**

Thryothorus sclateri

French: Troglodyte de Sclater **Spanish**: Cucarachero Jaspeado
German: Pünktchenbrust-Zaunkönig
Other common names: Maranon Wren

Taxonomy. *Thryothorus sclateri* Taczanowski, 1879, Guajango, River Marañón, Cajamarca, Peru.
Sometimes treated as conspecific with *T. maculipectus* or *T. rutilus*, or with both, but all three differ substantially in plumage and in song. Race *paucimaculatus* suggested by some as meriting rank of full species. Three subspecies recognized.
Subspecies and Distribution.
T. s. columbianus (Chapman, 1924) – Colombia, on W slope of C Andes (in Valle) and, disjunctly, W slope of E range (in Cundinamarca).
T. s. paucimaculatus Sharpe, 1882 – W Ecuador (Manabí S to Loja).
T. s. sclateri Taczanowski, 1879 – R Marañón drainage in extreme S Ecuador and N Peru (Cajamarca).



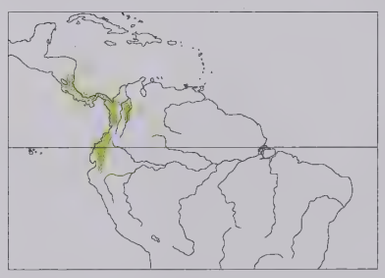
Descriptive notes. 13·5–14 cm. Nominate race has narrow white supercilium, dark eyestripe, sides of face and of neck mottled black and white; crown reddish-brown, back and rump medium brown; primaries and secondaries olivaceous brown with very obscure, inconspicuous darker barring; rectrices barred grey and dull black; chin to upper belly covered in fine black and white bars, these becoming broader and more diffuse on lower belly and flanks, which are also washed buff; eye reddish-brown; bill dark brown above, grey below; legs dark slate. Sexes similar. Juvenile is like adult, but markings below do not extend so far down on belly, iris brown. Race *columbianus* is smaller and duller than nominate, upperparts and flanks less warm and more olivaceous brown; *paucimaculatus* has much less extensive markings on underparts, with tendency towards spotting rather than barring. Voice. Song a series of fast, repeated phrases; probably an antiphonal singer. Call similar to sound made by scraping one's fingernails along a comb.
Habitat. Thickets and undergrowth in forests, both humid and (in S Ecuador) more arid. At 1300–2000 m in Colombia, to c. 1600 m in Ecuador and Peru.
Food and Feeding. No data on food items other than "insects" (stomach contents, Ecuador). Forages in forest understorey, usually in pairs; frequently joins mixed flocks with antbirds (Thamnophilidae) and others.
Breeding. No information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Locally fairly common to common. Suitable habitat remains in substantial areas of range, and this species can be reasonably numerous in such places. Occurs in several protected areas, e.g. Podocarpus National Park and Río Palenque Science Centre, in Ecuador.
Bibliography. Best *et al.* (1997), Clements & Shany (2001), Davies *et al.* (1994), Hilty & Brown (1986), Parker *et al.* (1995), Ridgely & Tudor (1989, 2001), Walker (2002), Wiedenfeld *et al.* (1985), Williams & Tobias (1994).

44. **Bay Wren**

Thryothorus nigricapillus

French: Troglodyte à calotte noire **Spanish**: Cucarachero Cabecinegro
German: Kastanienzaunkönig
Other common names: Black-capped Wren (S races)

Taxonomy. *Thryothorus nigricapillus* P. L. Sclater, 1860, Nanegal, c. 4000 feet [c. 1220 m], Pichincha, Ecuador.
Sometimes considered conspecific with *T. semibadius*, but differs in plumage and no evidence of intergradation where ranges approach in Costa Rica and W Panama; separation also supported by recent DNA analyses. In addition, N group of unbarred races (*costaricensis*, *castaneus*, *odicus*, *reditus*) sometimes treated as a separate species; in view of intergradation of the two groups in E Panama, however, most authorities merge them into a single species, notwithstanding major plumage differences between the geographical extremes. Seven subspecies recognized.
Subspecies and Distribution.
T. n. costaricensis (Sharpe, 1882) – SE Nicaragua (R Escondido) S through Caribbean drainage to W Panama.
T. n. castaneus Lawrence, 1861 – W Panama from Veraguas E to Canal Zone.
T. n. odicus Wetmore, 1959 – Escudo de Veraguas I, off NW Panama.
T. n. reditus (Griscom, 1932) – Caribbean slope of E Panama.
T. n. schottii (S. F. Baird, 1864) – E Panama (Darién) and NW Colombia (Antioquia, Chocó).
T. n. connectens (Chapman,1912) – SW Colombia (Cauca, Nariño).
T. n. nigricapillus P. L. Sclater, 1860 – W Ecuador (Esmeraldas S to El Oro).



Descriptive notes. 14·5 cm; 17·7–26·3 g. Distinctive. Nominate race has black face except for grey lores, narrow white supercilium, incomplete white eyering, white patch on rear ear-coverts; crown and nape black, back, shoulders and rump rich chestnut-brown; primaries and secondaries warm chestnut with black barring; rectrices rich brown, boldly barred black; throat white; underparts white, becoming warm brown on lower belly and flanks, with conspicuous blackish barring that increases from breast towards rear; eye light mouse-brown to red-brown; bill black above, dull bluish-grey below, orange-yellow at base; legs dark grey to black. Sexes similar. Juvenile is generally less brightly coloured than adult, with less contrast between crown and back. Race *connectens* has more extensive barring below than nominate; *schottii* has underpart barring narrower than in nominate; *castaneus* has white throat, contrasting rich chestnut underparts with no, or very little, barring; *costaricensis* is similar to previous but with deeper, richer chestnut below; *odicus* is generally paler than last, with larger bill; *reditus* is lighter-coloured, with more white on breast and some black barring on sides and abdomen. Voice. Song a varied series of loud ringing whistles, repeated, then varied and again repeated; frequently sings antiphonally, duets being initiated by female. Female responds strongly to playback of female song; male responds to tapes of both male and female songs, but paired males respond most to male song and unpaired males to female song. Call a diagnostic "heetowip" and a guttural "chu-r-r-k".
Habitat. Humid second growth and forest edge, especially near water; usually not in interior forest, which tends to be inhabited by *T. spadix*. Occurs in riverside reedbeds in E Panama (Darién), but may occur in drier habitat in Nicaragua. Sea-level to 1100 m.

Food and Feeding. Food probably entirely invertebrates; stomach contents from Panama included spiders (Araneae), earwigs (Dermaptera), beetles (Coleoptera) and cockroach eggs (Blattodea). Forages often in pairs, mostly low down in thick vegetation.
Breeding. Apparently protracted season in Panama, young hatchlings in Mar and nest-building in Nov; Jan–Aug in Colombia. Nest, built by both sexes, an "elbow-shaped" structure of grass stems, lined with finer grasses, usually located 1–5 m up in crotch of shrub. Eggs 3, white with cinnamon speckles, especially around blunt end; no information on incubation and fledging periods.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in suitable habitat over much of its range.
Bibliography. Allen (1998), Anon. (1998b), Best *et al.* (1997), Bloch *et al.* (1991), Brenowitz & Kroodsma (1996), Butler (1979), Carriker (1910), Chapman (1917), Cracraft (1985), Duguay (1997), González *et al.* (2003), Griscom (1932a), Haffer (1975), Hellmayr (1934), Hilty (1997), Hilty & Brown (1986), Levin (1988, 1996a, 1996b, 1998), Meyer de Schauensee (1982), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robbins *et al.* (1985), Salaman (1994), Slud (1960, 1964), Stiles & Skutch (1989), Stone (1918), Wetmore *et al.* (1984), Williams & Tobias (1994).

45. **Riverside Wren**

Thryothorus semibadius

French: Troglodyte des ruisseaux **German**: Uferzaunkönig **Spanish**: Cucarachero Ribereño
Other common names: Salvin's Wren

Taxonomy. *Thryothorus semibadius* Salvin, 1870, Bugaba, actually Chiriquí, Panama.
Sometimes considered conspecific with *T. nigricapillus*, but differs in plumage and no evidence of intergradation where ranges approach in Costa Rica and W Panama; separation also supported by recent DNA analyses. Monotypic.
Distribution. Mainly in Pacific drainage from C Costa Rica (S from S end of Golfo de Nicoya) S to W Panama.
Descriptive notes. 13–14 cm; 17 g. Has upper lores and upper supercilium black, lower part of lores and lower supercilium white; chin grey, ear-coverts and side of throat dull black with white spotting; crown bright orange-brown, nape, back and rump chestnut-brown; shoulders and primary and secondary wing-coverts blackish-grey, barred narrowly greyish-white; primaries and secondaries orange-brown with dull blackish bars; rectrices dull blackish with narrow buff-white bars; throat to



vent whitish-grey with narrow black bars, ground colour becoming more buffy posteriorly; eye light reddish-brown; bill black above, grey below; legs dull grey. Sexes similar. Juvenile is duller than adult, has fine blackish scaling on crown, black bars below less well defined, eye dull brown. Voice. Song, by both sexes, consists of loud ringing phrases of 1–4 notes, repeated frequently, then changing to different, continuously repeated phrase. Juvenile has different song, a long-drawn-out medley of low, sweet notes. Calls include harsh churr and various clear tinkling notes.
Habitat. Dense vegetation, particularly along borders of watercourses, swampy woodland edge and in steep precipices; sea-level to 1200 m.
Food and Feeding. Stomach contents include beetles (Coleoptera), cockroach eggs (Blattodea), spiders (Araneae) and earwigs (Dermaptera). Large insects dismembered piecemeal before being eaten. Forages low down, usually in pairs or in family groups; will briefly join mixed flocks attending ant swarms, but does not routinely follow army ants. Despite its close association with watercourses, does not forage at water's edge.
Breeding. Season very protracted, eggs found in Costa Rica in Feb, Jul, Aug and Dec. Nest, probably built by both sexes, constructed mostly from fine fibrous material, with some moss on roof, a globular structure with deep indentation on lower side where it fits over a single supporting twig, thereby dividing it into an antechamber on one side of twig and nesting chamber on other, downward-pointing entrance hole leading into antechamber; placed low down, typically 1·5–2·2 m above ground, frequently over flowing water; dormitory nests less substantial in construction. Eggs 2, white with fine pale brown or cinnamon speckles concentrated mostly at thick end; incubation by female alone, period 18–19 days; nestlings fed by both sexes, fledging period c. 16 days; family-members remain together for much of year.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in the South Central American Pacific Slope EBA. Common in suitable habitat over much of its range.
Bibliography. Angehr (2003), Anon. (1998b), González *et al.* (2003), Hellmayr (1934), Leck & Hilty (1970), Ridgely & Gwynne (1989), Ridgway (1904), Skutch (1940, 1960, 1985b, 2001), Slud (1964), Stiles & Skutch (1989), Wetmore *et al.* (1984).



PLATE 40

inches 3

cm 8

46. Stripe-breasted Wren

Thryothorus thoracicus

French: Troglodyte flammé **Spanish**: Cucarachero Pechirrayado
German: Streifenbrust-Zaunkönig

Taxonomy. *Thryothorus thoracicus* Salvin, 1865, Tucurriquí, Costa Rica.
Sometimes treated as conspecific with *T. leucopogon*, but differs significantly in both song and plumage. Monotypic.
Distribution. Caribbean slope from SE Honduras and NE Nicaragua (Bonanza) S to W Panama (Bocas del Toro E to Coclé, rarely to Canal Zone).



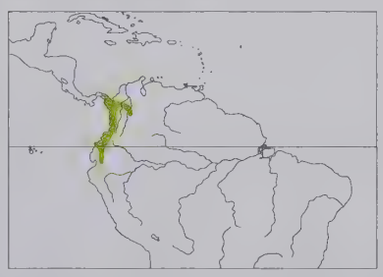
Descriptive notes. 11·5–12·5 cm; mean 17·6 g. Highly distinctive, with diagnostic chest pattern. Has lores blackish-grey, sides of face and of neck blackish-grey conspicuously streaked white; crown grey-brown; back, shoulders, primary and secondary wing-coverts and rump dark umber, coverts with narrow black bars; primaries and secondaries dull buff-brown, finely barred blackish; rectrices dull blackish, barred buff-brown; throat and chest with conspicuous broad black, white and grey streaks, producing teardrop appearance, and contrasting abruptly with unmarked dull olive-brown lower belly; eye red-brown; bill greyish-black above, bluish-grey below; legs grey-brown. Sexes similar. Juvenile is more russet above, crown with black scales, throat and chest greyish-brown with irregular white and dusky stripes, eye dull brown. Voice. Two distinct song types, very different from each other: one type, frequently heard at dawn, a uniform series of whistles on one note, very similar to song of some small owls such as Ferruginous Pygmy-owl (*Glaucidium brasilianum*), and seemingly uttered by one bird only, probably male; second type, often given antiphonally by both sexes, a cheerful series of liquid bubbling whistles, of c. 6–10 notes. Juveniles have a sweet, rambling song, quite different from that of adults. Calls include rolling "cherk" or "ch-r-r-k", as well as series of soft guttural chatters.
Habitat. Woodland edge, open areas of forest and tangled vegetation along streams; in Costa Rica, cacao plantations at lower elevations and shade coffee plantations higher up. Occurs from sea-level up to 1100 m.
Food and Feeding. Few data on food; prey items fed to young include spiders (Araneae), moths (Lepidoptera), caterpillars, cockroaches (Blattodea) and other insects. Typically, forages low down in thick vegetation.
Breeding. Season Mar–Jul in Costa Rica. Nest, built by both sexes, a globular two-part structure made of fibres and leaf skeletons with outer covering of green moss, chamber on one side of supporting twig and, dangled on other, a downward-pointing entrance and vestibule; placed typically in shrub or cacao bush, or on top of palm fronds, 1·5–6 m above ground; nests also used as dormitories. Eggs 2–3, unmarked white or bluish-white; incubation by female alone, period not recorded; young fed by both sexes, for c. 16 days.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in some locations; appears able to adapt to very modified habitats, such as plantations. Occurs in some protected areas, including Braulio Carrillo National Park, in Costa Rica.
Bibliography. Angehr (2003), Anon. (1998b), Blake & Loiselle (1991), Hellmayr (1934), Howell (1957), Meyer de Schauensee (1982), Ridgely & Gwynne (1989), Skutch (1972), Slud (1960, 1964), Stiles & Skutch (1989), Wetmore *et al.* (1984).

47. Stripe-throated Wren

Thryothorus leucopogon

French: Troglodyte balafré **Spanish**: Cucarachero Gorgirrayado
German: Streifenkehl-Zaunkönig
Other common names: Festa's Wren

Taxonomy. *Thryophilus leucopogon* Salvadori and Festa, 1899, River Peripa, Pichincha, Ecuador.
Sometimes treated as conspecific with *T. thoracicus*, but differs significantly in both song and plumage. Recently discovered population in W San Blas (Panama) not yet assigned to either race, tentatively included in *grisescens*. Two subspecies recognized.
Subspecies and Distribution.
T. l. grisescens (Griscom, 1932) – Caribbean slope in E Panama (W San Blas, Darién) and N Colombia.
T. l. leucopogon (Salvadori & Festa, 1899) – E Panama (Pacific slope of Darién) and Pacific drainage of Colombia and Ecuador.



Descriptive notes. 12 cm. Rather nondescript wren with diffuse throat markings. Nominate race has grey-brown lores, greyish-white supercilium, ear-coverts streaked dull black and greyish-white; crown and upperparts dark brown, more rufescent on rump; primaries and secondaries reddish-brown with fine blackish bars; rectrices dull reddish-brown, narrowly barred dull blackish; chin and throat sharply streaked with grey-white and blackish, streaks extending below ear-coverts, well demarcated from deep rufescent-buff upper chest; rest of underparts rufescent buff, becoming darker and richer on lower belly and vent; eye light brown or reddish-brown; bill black or dark grey above, light grey with blackish tip below; legs grey-black or grey-brown. Sexes similar. Juvenile is like adult but with less clearly defined streaking, eye brown (without reddish tinge). Race *grisescens* is noticeably greyer and paler, above and below, than nominate. Voice. Song a tuneless repetition of 2–3 notes, "chi-chi-chi"; no data on antiphonal or duetting song. Calls resemble some elements of song.
Habitat. Edges of secondary forest and *várzea*; sea-level to 900 m.
Food and Feeding. Few data on food; stomach contents "insects". Usually found in pairs, foraging 3–10 m up in thick vegetation; routinely participates in mixed flocks with other species.
Breeding. Nest-building observed at beginning of Mar in Panama; birds in breeding condition in Apr in NW Colombia. Nest an untidy ball with side entrance, usually placed near end of small branch with little effort at concealment. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Not well known; apparently rather scarce throughout much of its range. Occurs in Darién National Park, in Panama.
Bibliography. Anon. (1998b), Best *et al.* (1997), Chapman (1917), Christian (2001), Haffer (1975), Hilty & Brown (1986), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Stiles *et al.* (1999), Wetmore *et al.* (1984).

48. Banded Wren

Thryothorus pleurostictus

French: Troglodyte barré **German**: Akazienzaunkönig **Spanish**: Cucarachero Ventribarrado

Taxonomy. *Thryothorus pleurostictus* P. L. Sclater, 1860, Vera Paz, Guatemala.
Seven subspecies recognized.
Subspecies and Distribution.
T. p. nisorius P. L. Sclater, 1870 – SC Mexico (Michoacán E to Puebla).
T. p. oaxacae Brodkorb, 1942 – S Mexico (Guerrero E to Oaxaca).
T. p. acaciarum Brodkorb, 1942 – S Mexico (Chiapas).
T. p. oblitus (van Rossem, 1934) – Pacific lowlands from E Chiapas S to W El Salvador.
T. p. pleurostictus P. L. Sclater, 1860 – E Guatemala (Zacapa).
T. p. lateralis (Dickey & van Rossem, 1927) – C & E El Salvador and SW Honduras.
T. p. ravus (Ridgway, 1903) – Pacific lowlands of Nicaragua and N Costa Rica.



Descriptive notes. 14–15 cm; 14–23·8 g. Rather distinctive wren with heavy barring on flanks. Nominate race has dull blackish-brown lores, off-white supercilium, ear-coverts with fine speckles of black and off-white; crown and nape reddish-brown, shoulders, back and rump more rufescent; primaries and secondaries reddish-brown with narrow blackish bars, some white on webs; rectrices cinnamon-brown, barred dull blackish; chin, throat and chest unmarked greyish-white; prominent black bars on chest side, becoming wider lower down and extending across lower belly; undertail-coverts barred sharply black and white; eye dark brown; bill dark brown above, bluish-tinged flesh colour below; legs light brown to horn-brown. Sexes similar. Juvenile lacks most of facial markings, has chin and throat mottled brownish, unbarred underparts pale dull buff, mottled with darker brown. Race *nisorius* is larger than nominate, with more extensive barring on underparts; *oaxacae* is very like nominate but lacking white on primary webs; *acaciarum* is more buff on belly, with heavier flank barring; *oblitus* is larger and less warmly coloured above; *lateralis* is smaller and more brightly rufescent above than previous; *ravus* is smaller than nominate, with more brightly rufescent upperparts, less prominent barring on primaries and secondaries. Voice. Song a striking and beautiful series of varied whistles and gurgled trills, in some ways reminiscent of Common Nightingale (*Luscinia megarhynchos*); calls include a harsh nasal churring and short trills.
Habitat. Generally found in rather dry habitats; arid scrub-forest and tropical deciduous forest, including second growth. In swamp-forest in El Salvador, sometimes in mangrove swamps in Honduras and Costa Rica. Sea-level to 1600 m in Mexico; to 1100 m in Honduras and 800 m in Costa Rica.
Food and Feeding. Few data on prey items; invertebrates, including spiders (Araneae), recorded. Generally forages in pairs or family groups, usually low down or on ground; also higher up in trees if ground cover sparse.
Breeding. Season May–Jul in Mexico; in S Mexico and El Salvador extending into Aug, possibly to take advantage of second-hand nests. Nest shaped like old-fashioned chemical retort, built of weed stems, rootlets and similar material, lined with finer grasses, typically hung in crotch of tree, entrance tube sloping downwards at c. 45 degrees on one side and nesting chamber on other side; usually located 1–3 m up, frequently in bull's-horn acacia (*Acacia collinsii*) harbouring aggressive symbiotic ants, or near pendent nest of hornets (Vespidae) or in irritating nettle bush (*Urtica*); old pendent nest of Yellow-olive Flycatcher (*Tolmomyias sulphurescens*) 2–10 m up near end of slender branch frequently used in El Salvador. Eggs 2–5, sometimes white, more frequently pale blue to deeper sky-blue; no information on incubation and fledging periods.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Reasonably common to abundant in much of its range.
Bibliography. Anon. (1998b), Binford (1989), Blake (1953), Blake & Hanson (1942), Brodkorb (1942), Dickey & van Rossem (1938), Friedmann *et al.* (1957), Hellmayr (1934), Howell & Webb (1995), Joyce (1990), Komar & Domínguez (2001), Land (1970), Molles & Vehrencamp (1999, 2001a), Monroe (1968), Ridgway (1904), Rowley (1966, 1984), Skutch (1940), Slud (1964, 1980), Stiles & Skutch (1989).

49. Rufous-and-white Wren

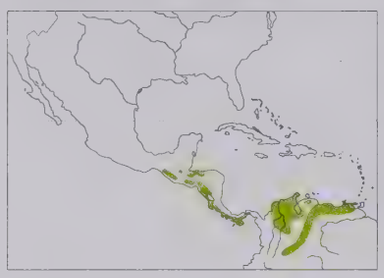
Thryothorus rufalbus

French: Troglodyte rufalbin **German**: Rotrückenzaunkönig **Spanish**: Cucarachero Rufiblanco

Taxonomy. *Thryothorus rufalbus* Lafresnaye, 1845, "Mexico"; error = Guatemala.
Sometimes considered to include *T. nicefori* as a race. Six subspecies recognized.

On following pages: 50. Niceforo's Wren (*Thryothorus nicefori*); 51. Sinaloa Wren (*Thryothorus sinaloa*); 52. Plain Wren (*Thryothorus modestus*); 53. Canebrake Wren (*Thryothorus zeledoni*); 54. Buff-breasted Wren (*Thryothorus leucotis*); 55. Superciliated Wren (*Thryothorus superciliaris*); 56. Fawn-breasted Wren (*Thryothorus guarayanus*); 57. Long-billed Wren (*Thryothorus longirostris*); 58. Grey Wren (*Thryothorus griseus*).

Subspecies and Distribution.
T. r. transfinis Friedmann, 1947 – extreme S Mexico (Chiapas).
T. r. rufalbus Lafresnaye, 1845 – highlands of Guatemala and El Salvador.
T. r. sylvus A. R. Phillips, 1986 – NW Honduras.
T. r. skutchi A. R. Phillips, 1986 – W Honduras S on Pacific slope to Panama (E to Canal Zone, also locally on Caribbean drainage).
T. r. cumanensis (Cabanis, 1861) – N Colombia and N Venezuela (Falcón E to Paría Peninsula, S to E Guárico and S Anzoátegui).
T. r. minlosi (Berlepsch, 1884) – NW Venezuela (W Zulia, and Cojedes S to S Táchira and W Apure) and E Colombia (S to Meta).



Descriptive notes. 14·5–16·5 cm; male mean 28 g, female mean 25 g. A strikingly rufous and rather large wren with conspicuous black and white facial markings. Nominate race has narrow grey-white supercilium, behind eye narrowly bordered blackish above and below; lores and post-ocular eyestripe brown, ear-coverts mottled whitish-buff and dull black; crown dark ochraceous brown, back and shoulders more rufescent, rump fox-brown; primaries and secondaries reddish-brown with blackish-brown barring; tail rufous-brown with narrow blackish bars; throat and chest off-white, chest mottled obscurely with greyish, flanks dull ochraceous brown, undertail-coverts barred blackish; eye hazel-coloured or reddish-brown; bill black above, bluish-flesh below; legs pale plumbeous grey. Sexes similar. Juvenile differs from adult in more obscure facial markings, more mottled chest, diffuse barring on undertail-coverts. Race *transfinis* has longer tail than nominate; *sylvus* is darker and redder above, with shorter, more broadly barred tail; *skutchi* is similar to previous, but with more black on side of head, paler dorsal part of tail; *cumanensis* resembles previous but paler above, whiter on chest; *minlosi* is darker above than last, with more heavily streaked ear-coverts, deeper tawny-brown flanks. VOICE. Song an almost strigid-like series of 4–5 slow, hooting whistles, often preceded and followed by a higher note, quite unlike that of any other *Thryothorus* wren; calls include a castanet-like chattering and a harsh alarm. Sexual differences studied in Costa Rica: male song has lower frequency characteristics; male sings more frequently, and male alone shows increased output at dawn; average repertoire size for male 10·8 song types, for female 8·5; most duetting results from female responding to male song.
Habitat. Mostly rather dry deciduous forest and forest edge, including plantations; less commonly in semi-humid forest. Found in gallery forest in Venezuelan *llanos*; in El Salvador, occurs in thickets of the palm *Bactris subglobosa* in non-breeding season. Mostly 300–1500 m, but down to sea-level in El Salvador in winter months.
Food and Feeding. Food mostly invertebrates, also some vegetable matter (berries). Forages low down in leaf litter and vine tangles, usually alone. During times of food scarcity, has been seen to kill nestlings of *Troglodytes musculus*, not to eat them, but apparently simply to eliminate competition for food.
Breeding. May–Jun in Costa Rica, Mar to early May in El Salvador and May–Jul in Venezuela. Nest a globular structure of grass, with downward-sloping entrance tube, frequently placed in bull's-horn acacias (*Acacia collinsii* or *A. cornigera*) hosting aggressive symbiotic ants. Eggs 2–3, rarely 4, unmarked blue-green or sky-blue; no information on incubation and fledging periods; young fed by female alone; family breaks up quite soon after fledging. Frequently parasitized by American Striped Cuckoo (*Tapera naevia*).
Movements. Largely resident; some evidence of altitudinal movement in El Salvador, where it occurs in coastal forest in the winter months but not in summer.
Status and Conservation. Not globally threatened. Generally considered to occur rather sparsely over much of its range. Does, however, show some ability to live in modified or artificial habitat, such as plantations. Present in several protected areas, including e.g. Carara Biological Reserve, in Costa Rica, Isla de Salamanca National Park, in Colombia, and Henri Pittier National Park, in Venezuela.
Bibliography. Ahumada (2001), Anon. (1998b), Blake (1953, 1962), Brenowitz & Kroodsma (1996), Carriker (1910), Chapman (1917), Dickey & van Rossem (1938), Farabaugh (1984), Freed (1987a), Friedmann & Smith (1950), Hellmayr (1934), Hilty (2003), Howell & Webb (1995), Komar & Domínguez (2001), Land (1970), Loetscher (1952), Mennill & Vehrencamp (2005), Meyer de Schauensee (1982), Monroe (1968), Morton & Farabaugh (1979), Ridgely & Tudor (1989), Ridgway (1904), Slud (1964, 1980), Stiles & Skutch (1989), Wetmore *et al.* (1984), Winnett-Murray (1987).

50. Niceforo's Wren

Thryothorus nicefori

French: Troglodyte de Niceforo **Spanish**: Cucarachero de Nicéforo
German: Niceforozaunkönig

Taxonomy. *Thryothorus nicefori* Meyer de Schauensee, 1946, San Gil, south of Bucaramanga, Santander, Colombia.
Taxonomic status uncertain, possibly a well-marked race of *T. rufalbus*; requires further study, especially of vocalizations (including alarm calls). Monotypic.
Distribution. San Gil area of Santander, in Colombia.



Descriptive notes. 14·5 cm. Has conspicuous white supercilium in front of and behind eye, contrasting with grey-brown eyestripe; ear-coverts mottled whitish-grey and dark grey-brown; crown and upperparts greyish-brown, obscurely barred darker brown, rump and lower back warmer brown, concealed white spots on feathers of lower back; primaries and secondaries rufescent brown, barred blackish; rectrices medium brown with darker bars; throat whitish, blackish malar stripe; underparts white, becoming grey on side of chest and buffy grey on flanks; eye reddish-brown; bill horn-colour above, whitish below; legs dull blue-grey. Differs from similar *T. rufalbus* in having much greyer upperparts. Sexes similar. Juvenile undescribed. VOICE. Poorly known. Song stated to be "exactly like that of *T. rufalbus*", but has also been suggested that it differs from latter's in duration.
Habitat. Dense acacia (*Acacia*) scrubland in upper tropical zone, at c. 1100 m. Appears unable to adapt to coffee plantations.
Food and Feeding. No published data.
Breeding. No information.
Movements. Presumably sedentary.
Status and Conservation. CRITICAL. Restricted-range species: present in the Colombian East Andes EBA. Seven specimens were taken in 1945, and a few more in the 1950s and 1960s. The species was not then observed until 1989, when two individuals were seen, and on two occasions in Jul 2000, when a single individual was observed, in xerophytic acacia scrub alongside the R Fonce. Suitable habitat in the vicinity of the most recent observations is estimated at no more than 1 km² in extent, and even this is in imminent danger from potential urban development. This wren seems to have very limited tolerance of habitat modification, and is absent from coffee plantations. Current remaining habitat is vulnerable to burning and to overgrazing by cattle and goats. In the absence of historical data, it is not known how extensive the original range may have been.
Bibliography. Adams *et al.* (2003), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Hilty (1985), Hilty & Brown (1986), López & Cadena (2002), Meyer de Schauensee (1946a, 1982), Negret (2001), Ridgely & Tudor (1989), Stattersfield & Capper (2000).

51. Sinaloa Wren

Thryothorus sinaloa

French: Troglodyte du Sinaloa **German**: Sinaloazaunkönig **Spanish**: Cucarachero Sinaloense
Other common names: Bar-vented Wren

Taxonomy. *Thryophilus sinaloa* S. F. Baird, 1864, Mazatlán, Sinaloa, Mexico.
Relationships with *T. rufalbus* uncertain. Three subspecies recognized.
Subspecies and Distribution.
T. s. cinereus (Brewster, 1889) – NW Mexico (NE Sonora S to N Sinaloa and W Chihuahua).
T. s. sinaloa (S. F. Baird, 1864) – C Sinaloa and adjacent W Durango S to Michoacán.
T. s. russeus (Nelson, 1903) – C Guerrero E to W Oaxaca, in S Mexico.



Descriptive notes. 12·5–14 cm; male 13·1–16·6 g, female 13·5–16·4 g. Nominate race has whitish supercilium, medium-brown lores and eyestripe, side of face and ear-coverts speckled blackish and grey-white; crown dull brown, becoming more rufous on back and, especially, on rump; primaries and secondaries rufous-brown with narrow darker barring; rectrices rufous-brown, transversely barred blackish-brown; throat and chest grey-white, chest side grey, flanks ochraceous brown, crissum whitish, strongly barred black; eye hazel-brown; bill medium horn-colour above, almost whitish below; legs pale reddish-brown. Differs from rather similar *T. felix* in having less prominent facial markings, pale brown (not warm rufous) flanks. Sexes similar. Juvenile has less distinct facial markings than adult, flanks washed with dusky. Race *cinereus* is decidedly paler and greyer than nominate; *russeus* is richer and darker in colour than nominate, with deep russet-brown back, cinnamon-rufous uppertail-coverts. VOICE. Song of male a cheerful series of clear, gurgling whistles interspersed with rapid trills, in some ways reminiscent of that of Common Nightingale (*Luscinia megarhynchos*); female song similar but shorter and more simple; unlike *T. felix*, does not sing in syncopated duets. Calls include churring notes and a loud chatter.
Habitat. Inhabits various types of open woodland, including thorn-forest, oak–hornbeam (*Quercus–Carpinus*) woods and tropical deciduous forest; often found in quite disturbed habitat. From sea-level up to 2000 m.
Food and Feeding. No recorded data on food; presumably mostly invertebrates. Forages at low or medium levels in vegetation.
Breeding. Nests in May and Jun at lower altitudes, but as late as Jul higher up; possibly double-brooded. Nest retort-shaped, usually made of grass stems, placed over branch, breeding chamber on one side and downward-pointing entrance tube on the other, typically at height of 1·3–3·5 m and frequently next to hornet nest or in acacia (*Acacia*) occupied by aggressive symbiotic ants. Eggs usually 5, unmarked bluish-white; no information on incubation and fledging periods.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common over much of its range. Frequently found in disturbed habitat.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Blake (1953), Brown (1977), Brown & Lennon (1979), Corcuera & Butterfield (1999), Friedmann *et al.* (1957), Grant (1966b), Hellmayr (1934), Howell & Webb (1995), Hutto (1980), Jones, R. (1998), Peterson & Navarro-Sigüenza (2000), Ridgway (1904), Ornelas *et al.* (1993), Short (1974), Stager (1954).

52. Plain Wren

Thryothorus modestus

French: Troglodyte modeste **German**: Cabaniszaunkönig **Spanish**: Cucarachero Modesto
Other common names: Cabanis's Wren, Modest Wren

Taxonomy. *Thryothorus modestus* Cabanis, 1861, San José, Costa Rica.
Frequently treated as conspecific with *T. zeledoni*, but the two differ substantially in song and plumage. Two subspecies recognized.
Subspecies and Distribution.
T. m. modestus Cabanis, 1861 – S Mexico (extreme E Oaxaca, Chiapas), C & S Guatemala, W Honduras and El Salvador S in Pacific watershed to Costa Rica.
T. m. elutus (Bangs, 1902) – Pacific drainage of Panama from about Costa Rican border to just E of Canal Zone.
Descriptive notes. 12·5–14 cm; male average 19·7 g, female average 17·9 g. A rather featureless wren, without strong facial markings or prominent barring or streaking. Nominate race has white supercilium, grey-brown lores and eyestripe; cheeks and ear-coverts mottled dark greyish-brown and grey-white; crown dark grey-brown, back rufous-brown, rump orange-rufous; primaries and secondaries warm brown with obscure darker bars; rectrices rufescent brown with narrow darker bars; throat white, chest pale greyish-buff, centre of belly buffy white, flanks, belly side and undertail-coverts warm orange-buff; eye bright reddish-brown; bill dark brown above, pale leaden-blue below; legs



bluish-slate. Differs from *T. zeledoni* in smaller size, much warmer coloration. Sexes similar. Juvenile has dark brown eye and flesh-coloured lower mandible. Race *elutus* is duller and more pale than nominate, and has longer bill, shorter tail and yellow eyes. Voice. Song a loud motif of 3–4 clear whistles, "chin-cheer-gwee" or "chin-cheery-gwee", sometimes given entirely by male, but frequently as a perfectly timed antiphonal performance, male giving first 2 or 3 notes and female the final one; unmated male has softer, less strident song; recently fledged juvenile sings quite differently, a low diffuse rambling song reminiscent of that of Grey Catbird (*Dumetella carolinensis*). Calls include harsh "chur" and tinkling "chi-chi-chi".
Habitat. Forest edge, second growth, well-vegetated gardens, overgrown citrus plantations with epiphytes, and similar habitats, in both dry and humid areas; avoids dense wet forest. Sea-level to c. 2000 m.
Food and Feeding. Food mostly insects and spiders (Araneae); an adult seen to feed a berry to fledgling. Usually found in pairs, foraging low down in dense vegetation, occasionally higher up in trees. Has been seen to attack eggs of other species, but more probably as a means of reducing competition than for actual food.
Breeding. Season in Costa Rica very protracted, with active nests found in Jan–Sept. Nest elliptical, the short axis being horizontal, circular entrance hole facing slightly downwards and sometimes protected by short lintel, made from grasses and vegetable fibres, lined with plant down, located 0·5–3 m up in dense vegetation; dormitory nest much more flimsy, unlined. Eggs 2, rarely 3, unmarked white; incubation by female alone, period 18 days; fledging period c. 14 days or more.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Common or abundant in much of its range. Adapts well to modified and regenerating habitat.
Bibliography. Anon. (1998b), Binford (1989), Blake (1953, 1958), Carriker (1910), Dearborn (1907), Dickey & van Rossem (1938), Fleischer & Tarr (1995), Hellmayr (1934), Howell & Webb (1995), Komar & Domínguez (2001), Land (1970), Monroe (1968), Ridgely & Gwynne (1989), Ridgway (1904), Skutch (1940, 1960, 1985b), Slud (1964, 1980), Sousa *et al.* (1982), Stiles & Skutch (1989), Wetmore *et al.* (1984), Willis (1980), Willis & Eisenmann (1979), Winker *et al.* (1999), Winnett-Murray (1987).

53. Canebrake Wren

Thryothorus zeledoni

French: Troglodyte de Zeledon **German**: Zeledonzaunkönig **Spanish**: Cucarachero de Zeledón
Other common names: Zeledon's Wren

Taxonomy. *Thryophilus zeledoni* Ridgway, 1878, Talamanca, Costa Rica.
Frequently treated as a race of *T. modestus*, but the two differ substantially in plumage and song. Monotypic.
Distribution. Caribbean drainage from E & SE Nicaragua (Greytown, Los Sabalos) S to W Panama (Bocas del Toro).



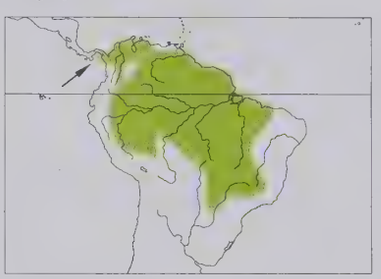
Descriptive notes. 14 cm. Has white supercilium contrasting sharply with grey crown and with grey-brown eyestripe; ear-coverts mottled grey and off-white; upperparts brownish-grey, becoming olivaceous on rump; primaries and secondaries dull grey-brown with obscure darker barring; rectrices olivaceous brown with conspicuous darker bars; off-white below, becoming grey on chest and grey-buff on lower belly; eye grey-brown; bill black above, grey below; legs dark olive. Differs from somewhat similar *T. modestus* in larger size and considerably more grey coloration. Sexes similar. Juvenile has more obscure facial markings and duller underparts than adult. Voice. Sexes sing in complex duet, with three main components, each distinctive in structure: rapid and highly co-ordinated alternation of two-part phrases by female and very brief, fast, low-frequency phrases by male, the whole preceded by somewhat longer, higher-frequency phrase of 4-6 elements by male; sexes have repertoire of each of their respective components, and phrase types are specifically associated with each other to form repertoire of duet types. Very occasionally, male's introductory phrase, frequently given also as solo song, is omitted.
Habitat. Second growth, regenerating farmland and wild canebrakes; absent from virgin forest. Sea-level to about 600 m; not reaching elevations occupied by *T. modestus*.
Food and Feeding. No data on food items. Forages in lower levels of dense undergrowth.
Breeding. Following details mostly from study of ringed population (21 pairs, 11 nests located) in Costa Rica, Mar–Aug. Nest ovoid, dimensions c. 10 cm × 6·7–10·3 cm, height 16–19 cm, side entrance at top with "visor" forming slight downward-pointing tunnel, made from plant fibres, lined with seed down and feathers; built by female, taking c. 3 days; placed 0·65–1·65 m above ground across thin horizontal branch, usually in dense scrub or vine tangle; much flimsier dormitory nests also built, by both sexes. Eggs 2 or 3, clear pale blue; incubation 14 days; chicks fed by both parents, nestling period 14–15 days; young sometimes leave nest before fully able to fly, fed near nest for 2 further days, before following parents away from it. Success low: of 20 eggs laid, 11 hatched and two chicks survived to independence; predation by e.g. snakes and coatis (*Nasua narica*) thought largely responsible; nests also parasitized by Bronzed Cowbird (*Molothrus aeneus*).
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in parts of its range. Seems to adapt well to moderately disturbed habitat.
Bibliography. Carriker (1910), Eisenmann (1957), Hellmayr (1934), Mann *et al.* (2003), Marschall-Ball & Slater (2003), Ridgely & Gwynne (1989), Slud (1964), Stiles & Skutch (1989), Wetmore *et al.* (1984).

54. Buff-breasted Wren

Thryothorus leucotis

French: Troglodyte à face pâle **Spanish**: Cucarachero Pechihabano
German: Weißohr-Zaunkönig
Other common names: Buff-bellied Wren

Taxonomy. *Thryothorus leucotis* Lafresnaye, 1845, Honda, River Magdalena, Tolima, Colombia.
Forms a superspecies with *T. superciliaris*, *T. guarayanus* and *T. longirostris*. Taxonomy disputed; has variously been treated as conspecific with any one of these, or all merged as a single species. In addition, race *rufiventris* has sometimes been treated as a full species. Eleven subspecies recognized.
Subspecies and Distribution.
T. l. galbraithii Lawrence, 1861 – E Panama (E from Canal Zone) and NW Colombia (Chocó, N Antioquia).
T. l. conditus (Bangs, 1903) – Coiba I and Pearl Is (Rey, San Miguel, Viveros), off S Panama.
T. l. leucotis Lafresnaye, 1845 – N Colombia from R Sinu E to Santa Marta, and S into Magdalena Valley.
T. l. collinus (Wetmore, 1946) – Serranía de Macuira, in N Guajira (N Colombia).
T. l. venezuelanus Cabanis, 1851 – N Colombia (E Santa Marta, plains of Guajira) and NW Venezuela (N & E Zulia E to Yaracuy, Cojedes and Aragua, S to Barinas).
T. l. zuliensis Hellmayr, 1934 –NW Venezuela (W Zulia S to NW Táchira and W Mérida) and adjacent Colombia (Norte de Santander).
T. l. hypoleucus (Berlepsch & Hartert, 1901) – NC Venezuela (N Apure, Guárico, S Anzoátegui, N Bolívar).
T. l. albipectus Cabanis, 1849 – NE Venezuela (SE Monagas S to N & E Bolívar), the Guianas and NE Brazil (E Amazonas E to N Maranhão, S to N Mato Grosso).
T. l. bogotensis (Hellmayr, 1901) – E Colombia and C Venezuela (S Táchira and extreme SW Barinas E to W Bolívar and Amazonas).
T. l. peruanus (Hellmayr, 1921) – lowlands of E Ecuador, SE Colombia, E Peru (S to Junín) and W Brazil (Amazonas).
T. l. rufiventris P. L. Sclater, 1870 – EC Brazil (Mato Grosso, Goiás, Minas Gerais) S to extreme E Paraguay.



Descriptive notes. 14–14·5 cm; male average 21 g, female average 18 g. Nominate race greyish lores, white supercilium, brown eyestripe, ear-coverts mottled grey-brown and whitish; crown and upperparts uniform greyish-brown, becoming warm orange-brown on rump and uppertail-coverts; upperwing-coverts greyish-brown, narrowly barred blackish; primaries and secondaries conspicuously barred buff-brown and blackish; rectrices dull reddish-brown, barred blackish; chin and throat off-white, chest buffy, belly cinnamon, becoming deep cinnamon-buff on lower flanks and vent; eye dusky brown; bill black above, whitish or bluish-flesh below; legs grey or lead-blue. Differs from *T. modestus* in more distinctly barred wings and tail, with much stronger buff colour below. Sexes similar. Juvenile resembles adult but with more diffuse facial markings. Race *venezuelanus* is less rufescent and with paler underparts than nominate; *bogotensis* resembles previous but is more rufescent on upperparts, darker on underparts; *collinus* is also similar, but darker below; *zuliensis* has more intense colour, especially on upperparts; *hypoleucus* has upperparts olivaceous rather than rufous, and pale underparts; *albipectus* has limited rufescent tone above, paler below than nominate; *peruanus* is closest to previous, but smaller, shorter-tailed, with darker upperparts, duller underparts; *rufiventris* is also similar, but with underparts deep ochraceous, bill longer; *conditus* has much plainer face, and is larger, and deeper in colour, than nominate; *galbraithii* resembles last, but paler and rather smaller. Voice. Song is a complex antiphonal production of both sexes, a series of abrupt sharp notes mixed with short clear whistles, resulting in a motif, frequently repeated, of c. 12 or more notes; juvenile male (using male song-type) sings antiphonally with the mother, female with father. Call a rapid "chit-cho-cho".
Habitat. Second growth, brush and forest edge; frequently associated with water. In Venezuela, largely confined to gallery forest in N, in *várzea* in S (Amazonas); common in mixed habitat of mangrove and flooded palm (*Manicaria*) forest in Delta Amacuro. Sea-level to 950 m in Venezuela; to 300 m in Ecuador.
Food and Feeding. Largely invertebrates; stomach contents in Suriname beetles (Coleoptera), hymenopterans, bugs (Hemiptera), lepidopterans and flies (Diptera), in Panama caterpillars, spiders (Araneae) and pseudoscorpions (Pseudoscorpiones). Usually in pairs or family parties. Forages mainly 0·2–5 m above ground, occasionally higher, more rarely on ground; often seeks food in subcanopy vines.
Breeding. Season protracted, Jan–Sept in Suriname, Jan to at least Jun in Venezuela. Co-operative breeding recorded in Panama, with small proportion of young of previous year remaining on parents' territory and at least one such bird provisioning nestlings. Nest, built by both sexes, is a globular structure of dead leaves, grass, etc., with short access tunnel to chamber; situated 1 m or more above ground, frequently in a palm; builds multiple nests. Eggs 2–3, white with small brown spots; incubation by both sexes (unusual among tropical wrens), period not recorded; no information on fledging period; fledglings remain with parents for prolonged time, and begin singing during this period. Frequently parasitized by American Striped Cuckoo (*Tapera naevia*).
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in suitable habitat over much of its range; locally common to abundant, as, for example, in flooded palm forest mixed with mangroves in NE Venezuela (Delta Amacuro). Occurs in many protected areas, e.g. Henri Pittier National Park, in Venezuela, and Brasília National Park, Rio Cristalino Forest Reserve and Anavilhanas Ecological Station, in Brazil.
Bibliography. Ahumada (2001), Allen (1995), Anon. (1998b), Best *et al.* (1997), Chapman (1917), Dubs (1992), Eisenmann (1950), Farabaugh (1984), Friedmann (1948), Gill (2004), Gyldenstolpe (1950), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Morton (1980), Oren & Parker (1997), Parker & Remsen (1987), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Schäfer & Phelps (1954), Sick (1993, 1997), Skutch (1968), Tostain *et al.* (1992), Wetmore *et al.* (1984), Willard *et al.* (1991), Willis & Eisenmann (1979), Wright *et al.* (1985), Zimmer *et al.* (1997).

55. Superciliated Wren

Thryothorus superciliaris

French: Troglodyte bridé **German**: Küstenzaunkönig **Spanish**: Cucarachero Cejón

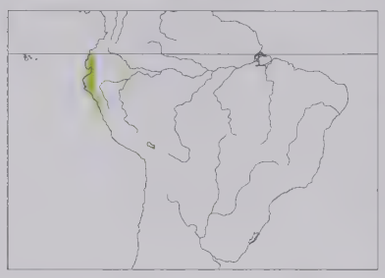
Taxonomy. *Thryothorus superciliaris* Lawrence, 1869, Isla de Puná, Ecuador.

Forms a superspecies with *T. leucotis*, *T. guarayanus* and *T. longirostris*; sometimes treated as conspecific with first of those, but distinct in vocalizations and ecology. Two subspecies recognized.

Subspecies and Distribution.

T. s. superciliaris Lawrence, 1869 – W Ecuador (Manabí S to Guayas).

T. s. baroni (Hellmayr, 1902) – S Ecuador (El Oro, Loja) and W Peru (S to Ancash).



Descriptive notes. 14·5 cm. Nominate race has grey lores, prominent white supercilium, dark brown eyestripe, buffy-white ear-coverts; crown dark greyish-brown, back and shoulders rufous-brown, becoming more rufescent on rump; primaries and secondaries warm brown, blackish bars on outer webs; rectrices reddish-brown with transverse black bars; chin and throat pale buffy white, darker on lower chest, more buff-grey on flanks; eye brown; bill black above, grey below, dark tip; legs grey. Differs from *T. leucotis* in having white, not buff, chest, less well-marked ear-coverts. Sexes similar. Juvenile resembles adult, but less warm brown above, duller on crown. Race *baroni* is more rufescent than nominate, with rump and lower back brighter tawny-brown. Voice. Song a series of short repeated phrases of 2 or 3 notes, sometimes extending into longer phrases with trills, not so rich or so musical as that of *T. leucotis*; probably both sexes sing.

Habitat. Typically in dry woodland and scrub, hedgerows and brushland; less commonly in more humid woodland. Sea-level to 1500 m, locally to 1850 m.

Food and Feeding. Little information; stomach contents "insects". Usually in pairs; forages low down in vegetation, or on ground.

Breeding. Nests at least in Jan and Feb in Peru; may be double-brooded. Nest a retort-shaped, rather flimsy construction, lateral entrance covered by long frayed porch, egg-chamber lined with finer material and feathers, sited 1·6–3·2 m up in bush or tree, often close to wasp nest, more rarely under roof of old building; multiple nests built, only some used for breeding, others unlined. Eggs 2–3, white with slight greenish tinge; incubation period not recorded; fledging period, in nest shared with young Shiny Cowbird (*Molothrus bonariensis*), 10–13 days. Parasitism by cowbird very frequent.

Movements. Apparently sedentary.

Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA. Quite common in some parts of range, less so in others. Seems able to tolerate moderately disturbed habitat.

Bibliography. Best & Kessler (1995), Best *et al.* (1997), Butler (1979), Clements & Shany (2001), Cracraft (1985), Hellmayr (1934), López & Gastezzi (2000), Marchant (1960), Meyer de Schauensee (1982), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Taczanowski (1884), Walker (2002).

56. **Fawn-breasted Wren**

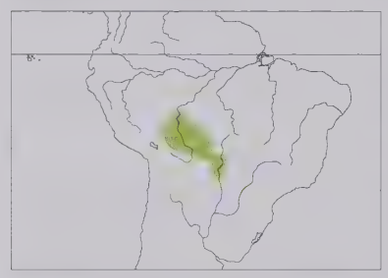
Thryothorus guarayanus

French: Troglodyte des Guarayos **Spanish**: Cucarachero del Guarayos
German: Guarayoszaunkönig

Taxonomy. *Troglodytes guarayana* d'Orbigny and Lafresnaye, 1837, Guarayos, Santa Cruz, Bolivia.

Forms a superspecies with *T. leucotis*, *T. superciliaris* and *T. longirostris*; sometimes regarded as conspecific with first of those, although vocalizations quite distinct. Monotypic.

Distribution. Lowland areas of NE Bolivia (E Pando, E La Paz, E Cochabamba, Beni, Santa Cruz), adjacent Brazil (E Rondônia, SW Mato Grosso) and extreme NE Paraguay.



Descriptive notes. 13·5 cm; 13–14 g. Has narrow white supercilium behind eye; ear-coverts mottled grey-white and blackish; crown and upperparts unmarked medium-brown, becoming more rufescent on lower back and rump; primaries, secondaries and upperwing-coverts rufescent brown with narrow blackish bars; rectrices reddish-brown with 10–12 sharply defined black bars; chin whitish, narrow black malar stripe, blackish moustachial stripe on white background; chest warm orange-buff, belly and vent deep orange-buff; eye hazel; bill black above, lead-blue below; legs lead-blue. Distinguished from very similar *T. leucotis* by having more buff on throat, less rufescent upperparts, more strongly marked cheeks. Sexes similar. Juvenile has facial pattern less sharply demarcated than adult's. Voice. Song, given antiphonally by both sexes, male contribution a repeated series of notes, e.g. "cheerilo-choli" or faster "chililililoo", female "pew-pew, pew-pew"; more simple in form than that of *T. leucotis*. Calls include "pew-pew", often repeated, and various harsh clicking sounds.

Habitat. *Várzea* scrubland, and secondary growth, usually near water; to c. 400 m.

Food and Feeding. No published information on food items. Forages in pairs during dry season, in small family groups of up to four individuals after breeding. Seeks food from ground level to 2–4 m up, at times to 10 m, in dense creeper growth.

Breeding. Little available information; few nests described. Nest with eggs in late Jan in Bolivia. Nest a rather flimsy domed structure with side entrance, made from fine grasses and root hairs of *Cecropia* trees but no leaves, much less robustly constructed than that of *T. genibarbis*; c. 1–3 m up, sometimes above water, in weeds or bushes, or in spiny base of small palm. Eggs 2, white with fine spots around blunt end; no information on incubation and fledging periods. Sometimes parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Apparently sedentary.

Status and Conservation. Not globally threatened. Locally common in parts of range; fairly common in E Bolivia (Santa Cruz).

Bibliography. Brace *et al.* (1997), Davis (1993), Dubs (1992), Flores, Rumiz & Cox (2001), Flores, Rumiz, Fredericksen & Fredericksen (2002), Guerrero & Arambiza (2001), Hellmayr (1934), Hennessey *et al.* (2003), Meyer de Schauensee (1982), Pearson (1975), Ridgely & Tudor (1989), Short (1975), Sick (1993, 1997).

57. **Long-billed Wren**

Thryothorus longirostris

French: Troglodyte à long bec **Spanish**: Cucarachero Piquilargo
German: Langschnabel-Zaunkönig

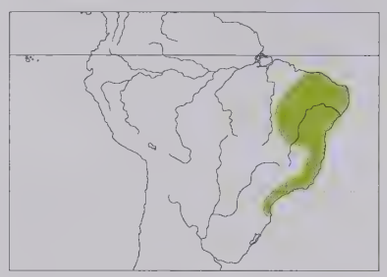
Taxonomy. *Thryothorus longirostris* Vieillot, 1819, Brazil.

Forms a superspecies with *T. leucotis*, *T. superciliaris* and *T. guarayanus*; treated by some authors as conspecific with first of those. Race *bahiae* possibly a separate species, differing from nominate in plumage, voice and habitat. Two subspecies recognized.

Subspecies and Distribution.

T. l. bahiae (Hellmayr, 1903) – NE Brazil, from Ceará and Piauí S to Bahia and N & E Minas Gerais.

T. l. longirostris Vieillot, 1819 – coastal region of E Brazil, from SE Bahia S to E Santa Catarina.



Descriptive notes. 19–21·5 cm; 20–21 g. Nominate race has greyish lores, off-white supercilium, medium dark brown eyestripe; ear-coverts and area under eye mottled off-white and dark grey; crown and nape rich dark brown, becoming more rufescent on lower back, where obscurely barred darker; rump reddish-brown; primaries, secondaries and tertials deep reddish-brown, narrowly barred black; rectrices reddish-brown with transverse darker bars, broader distally; chin off-white, narrow blackish malar stripe, throat pale buff to whitish (variable, lower throat sometimes as chest); chest reddish-buff, belly deep rich buff; eye brown to reddish-brown; bill blue-grey, darker or black above; legs dull grey. Differs from very similar *T. leucotis* in having longer bill and more rufescent underparts. Sexes similar. Juvenile is very like adult, but facial markings and malar stripe less well defined, eye grey, bill shorter. Race *bahiae* is somewhat paler than nominate above, especially on rump, rectrices with broader dark barring, underparts much less saturated, with whiter, less boldly streaked auriculars. Voice. Song loud and varied, by both sexes, male and female having slightly differing phrases, superimposed in duet, loud "choop-chip-chip", "chee-wah-lii", and similar; also a quieter, individual song, by both sexes but without synchronization. Songs of an individual may change during course of a day (according to popular local belief, in response to weather conditions).

Habitat. Secondary forest, shrubby clearings and forest edge, arboreal *caatinga* (deciduous forest with cacti and bromeliads), mangroves; locally common in fairly tall, dense *restinga* (white-sand vegetation near coasts). Much less closely associated with water than is *T. leucotis*. Sea-level to 900 m.

Food and Feeding. No published data on diet. Seems always to forage in pairs or singly, within 5 m of ground, more usually at less than 2 m.

Breeding. Juveniles in Feb to late Mar, and adult male with enlarged testes in Sept, suggesting that breeding coincides with local rainy season. Nest domed, with downward-sloping entrance port; also builds simpler dormitory nests. No other information.

Movements. Apparently sedentary.

Status and Conservation. Not globally threatened. Frequently common or abundant. Common in SE of range, including on offshore islands; rather rare in S (Santa Catarina). Occurs in a number of protected areas, e.g. Cavernas do Peruaçu National Park, in Minas Gerais.

Bibliography. Buzzetti (2000), Cracraft (1985), Goerck (1999), Guix *et al.* (1992), Hellmayr (1929, 1934), Hinkelmann & Fiebig (2001), Kirwan *et al.* (2004), Mallet-Rodrigues & Marinho (2003), Marsden *et al.* (2003), Meyer de Schauensee (1982), Naka *et al.* (2001), Parker & Goerck (1997), Pinto & Camargo (1961), Ridgely & Tudor (1989), do Rosário (1996), Sick (1993, 1997).

58. **Grey Wren**

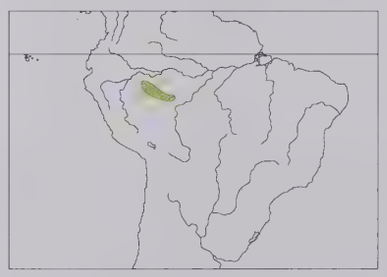
Thryothorus griseus

French: Troglodyte gris **German**: Grauzaunkönig **Spanish**: Cucarachero Gris
Other common names: Amazon Wren

Taxonomy. *Thryophilus griseus* Todd, 1925, Hiutanaã, River Purús, Amazonas, Brazil.

Exhibits a number of features (e.g. small size, short tail, grey plumage without prominent facial markings) that are not typical of present genus; although traditionally included here, may well merit separate generic status. Study of its breeding biology and social structure, virtually nothing of which is known, could shed light on its true taxonomic status. Monotypic.

Distribution. SW Amazonas (along R Javari, upper R Juruá, upper R Purús), in W Brazil.



Descriptive notes. 11·5 cm. Has inconspicuous whitish eyestripe, grey ear-coverts obscurely mottled darker; crown and upperparts uniform unmarked lead-grey; primaries and secondaries blackish-grey on inner webs, outer webs dull lead-grey with very obscure dark bars; rectrices dull grey with broad blackish bars; chin and throat whitish-grey, chest grey, lower belly slightly buff-grey; eye brown; bill blackish above, dull horn below; legs dull blue-grey. Sexes similar. Juvenile undescribed. Voice. Song a repeated phrase of 2 or 3 notes, "chu-choww" or "chippit, chippit", becoming louder with repetition, simpler in form than is typical for this genus; whether both sexes sing is not known.

Habitat. Tangled undergrowth at edge of *várzea* and overgrown clearings; to 200 m.

Food and Feeding. No published data on food items. Usually forages in pairs or family parties in tangled undergrowth.

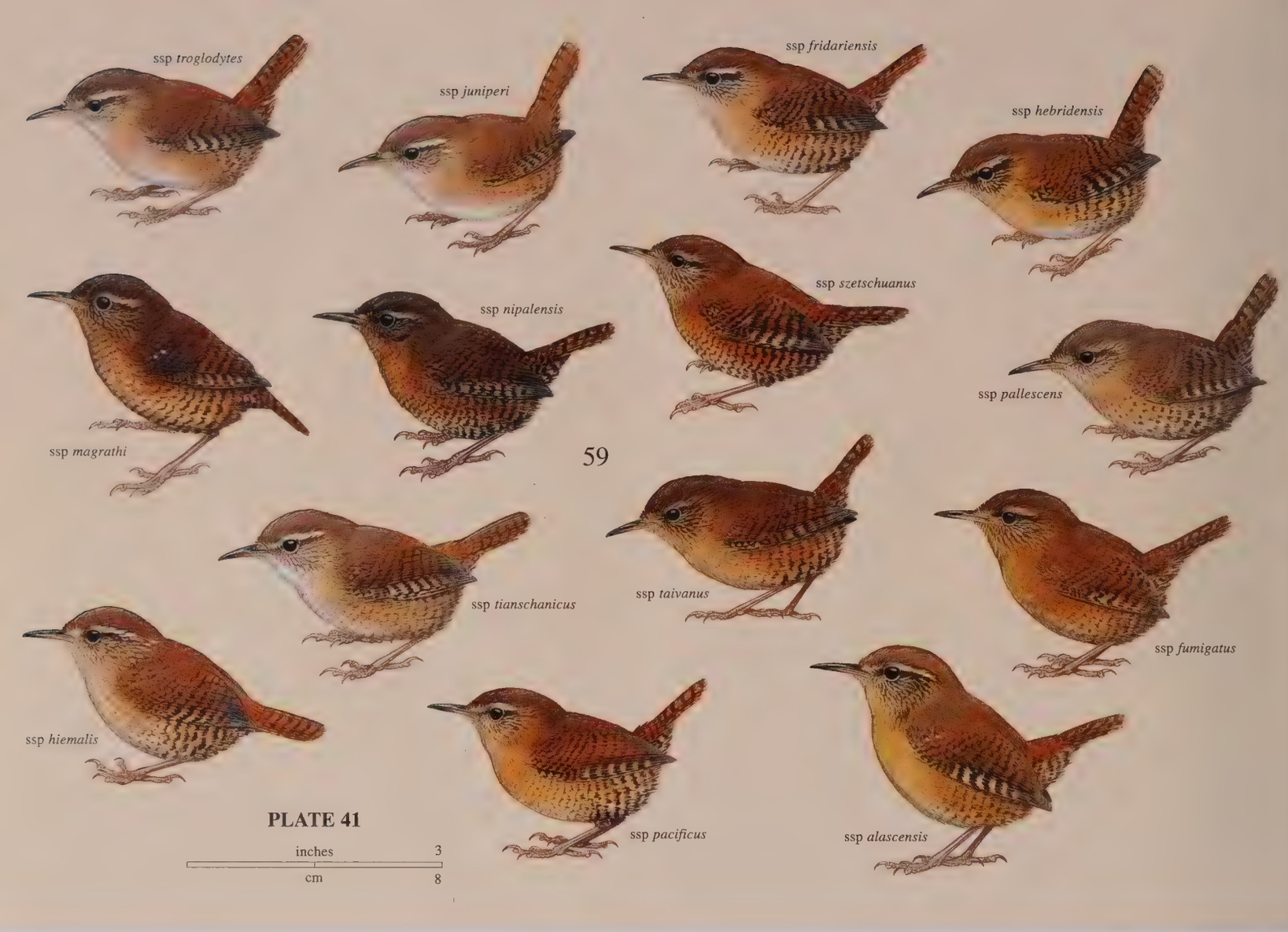
Breeding. No information.

Movements. Apparently sedentary.

Status and Conservation. Not globally threatened. Poorly known; apparently quite common in some locations within its limited range. Requires much further study.

Bibliography. Cracraft (1985), Gyldenstolpe (1950), Hellmayr (1934), Meyer de Schauensee (1982), Ridgely & Tudor (1989), Sick (1993, 1997), Zimmer & Mayr (1943).

PLATE 41 ➤



Genus *TROGLODYTES* Vieillot, 1809

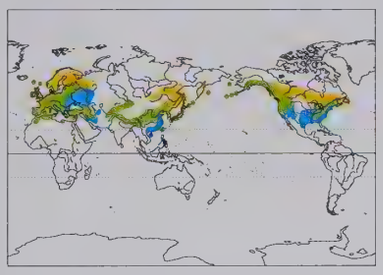
59. **Northern Wren**

Troglodytes troglodytes

French: Troglodyte mignon **German**: Zaunkönig **Spanish**: Chochín Común
Other common names: Wren, Common/Holarctic Wren; Winter Wren (America)

Taxonomy. *Motacilla Troglodytes* Linnaeus, 1758, Sweden.
It has been proposed, on the basis of DNA analysis, that this species is sufficiently distinct from its congeners (all confined to New World) to warrant placement in its own monotypic genus, for which the name *Nannus* is available. Recent DNA work suggests that it contains six distinct clades, in, respectively, W Nearctic, E Nearctic, Europe, E Asia, Nepal, and Caucasus, indicating cryptic speciation. Also, vocal differences exist between birds in W Nearctic and those in E, and both differ also from Old World birds, suggesting that at least three species may be involved. Numerous races of doubtful validity have been described. Race *orii* (Daito Is, in Japan) extinct. Forty-four extant subspecies recognized.
Subspecies and Distribution.
T. t. islandicus Hartert, 1907 – Iceland.
T. t. borealis Fischer, 1861 – Faroe Is.
T. t. zetlandicus Hartert, 1910 – Shetland Is.
T. t. fridariensis Williamson, 1951 – Fair I (S of Shetland Is).
T. t. hirtensis Seebohm, 1884 – St Kilda, in Outer Hebrides, off W Scotland.
T. t. hebridensis Meinertzhagen, 1924 – Outer Hebrides (except St Kilda).
T. t. indigenus Clancey, 1937 – Britain (except Shetland Is and Outer Hebrides) and Ireland.
T. t. troglodytes (Linnaeus, 1758) – much of mainland Europe, from Scandinavia E to Urals, S to Iberia, Italy and Greece.
T. t. kabylorum Hartert, 1910 – Balearic Is and N Africa (Morocco E to Tunisia), perhaps also S Spain.
T. t. koenigi Schiebel, 1910 – Corsica and Sardinia.
T. t. juniperi Hartert, 1922 – NE Libya (from about Tocra Pass E to Darnah).
T. t. cypriotes (Bate, 1903) – Cyprus and N Middle East (S to N Israel).
T. t. hyrcanus Zarudny & Loudon, 1905 – Crimea, Caucasus, N Turkey and N Iran.
T. t. zagrossiensis Zarudny & Loudon, 1908 – W Iran (Zagros Mts).
T. t. tianschanicus Sharpe, 1882 – mountains from Tien Shan (possibly from Altai) S to Pamir and NE Afghanistan.
T. t. subpallidus Zarudny & Loudon, 1905 – NE Iran E to S Uzbekistan and NW Afghanistan.
T. t. magrathi (Whitehead, 1907) – SE Afghanistan and adjacent W Pakistan.
T. t. neglectus W. E. Brooks, 1872 – W Himalayas (Gilgit E to W Nepal).
T. t. nipalensis Blyth, 1845 – C & E Himalayas (Nepal E to NE India and S Tibet).
T. t. idius (Richmond, 1907) – NC China (NE Qinghai and Gansu E to Hebei).
T. t. szetschuanus Hartert, 1910 – WC China (E Xizang, SE Qinghai, W Sichuan).
T. t. talifuensis (Sharpe, 1902) – S China (S Sichuan, N Yunnan) and NE Myanmar.
T. t. dauricus Dybowski & Taczanowski, 1884 – SE Siberia, NE China, Korea, and Tsushima I (SW Japan).
T. t. pallescens (Ridgway, 1883) – Kamchatka Peninsula and Commander Is.
T. t. kurilensis Stejneger, 1889 – N Kuril Is.
T. t. fumigatus Temminck, 1835 – S Kuril Is, Sakhalin, and Japan (including islands of Quelpart and Iki).
T. t. mosukei Momiyama, 1923 – Izu Is, off SE Honshu (Japan).
T. t. ogawae Hartert, 1910 – Tanegashima and Yakushima islands, off S Kyushu (Japan).
T. t. taivanus Hartert, 1910 – Taiwan.
T. t. alascensis S. F. Baird, 1869 – Pribilof Is (St George, St Paul, Otter).
T. t. meligerus (Oberholser, 1900) – W Aleutian Is (Attu, Buldir).
T. t. kiskensis (Oberholser, 1919) – W Aleutians (Kiska, Little Kiska, Amchitka, Oglinga).
T. t. tanagensis (Oberholser, 1919) – WC Aleutians (Tanaga, Adak, Atka).
T. t. seguamensis Gabrielson & Lincoln, 1951 – C Aleutians (Seguam, Amutka, Yunaska).
T. t. petrophilus (Oberholser, 1919) – Unalaska, in E Aleutians.
T. t. stevensoni (Oberholser, 1930) – W Alaska Peninsula, including Amak I and Amagat I.
T. t. ochroleucus Rea, 1986 – islands of Baranoff, Admiralty, Chichagof, Mitkof and Kupreanof, off S Alaska Peninsula.
T. t. semidiensis (Brooks, 1915) – Semidi Is, off S Alaska Peninsula.
T. t. helleri (Osgood, 1901) – Kodiak I and Afognak I, off S Alaska.
T. t. pacificus S. F. Baird, 1864 – breeds W North America from SE Alaska, SW Yukon, British Columbia and SW Alberta S in USA to Oregon; non-breeding S to Arizona and S California.
T. t. muiri Rea, 1986 – coastal W USA from SW Oregon S to C California.

T. t. obscurior Rea, 1986 – interior W USA from Oregon (S from Cascades) S to EC California (also on C coast S from San Francisco Bay) and Nevada.
T. t. hiemalis Vieillot, 1819 – breeds E North America from C Canada E to Newfoundland and in NE USA (Wisconsin E to New York and Pennsylvania); non-breeding from S Canada (S Ontario) S to Texas and Florida, rarely to NE Mexico.
T. t. pullus (Burleigh, 1935) – breeds in Appalachians (from Virginia and West Virginia S to Georgia); non-breeding range not known.



Descriptive notes. 9–10 cm; 6–12 g. Nominate race has pale buff supercilium, brown lores and ear-coverts, spotted off-white; crown dark brown, back warmer brown, rump more rufous-brown; shoulders and upperwing-coverts rufous-brown with darker barring; primaries and secondaries brown, barred darker; rectrices warm brown with dark transverse bars; chin and throat pale buff-brown, centre of throat sometimes whiter; chest and belly warmer rufous-brown, central belly uniform buff-white, flanks darker rufous-brown, blackish barring on lower flanks; eye brown; bill brown, pale base; legs light brown. Differs from e.g. *T. aedon* (the most widely distributed sympatric species) in smaller size, shorter tail, and generally darker and more rufous coloration, especially below. Sexes similar. Juvenile has indistinctly mottled breast, more obscure barring on flanks. Races differ mainly in size, general coloration, and extent of barring, and American races fall into three broad groups (large, long-billed and pale birds in Alaska and islands, small, short-billed and dark-coloured W races, and medium, reddish-brown birds with pale throat in E): *islandicus* is substantially larger than nominate, bill heavier, generally darker brown, barring more pronounced, especially below; *indigenus* is darker, duller and less rufous than nominate; *hirtensis* is similar to previous but larger, more grey-brown above, pale and well barred below; *zetlandicus* is much darker above and below than previous, more rufous-brown; *fridariensis* resembles last but paler above and below; *borealis* is also paler, and more heavily barred; *hebridensis* is more buffy, less heavily barred and with less stout bill; *koenigi* is darker, more earth-brown and less rufous, than nominate; *kabylorum* is paler above and below than nominate; *juniperi* is like previous, but bill longer, feet dark-coloured; *cypriotes* is more extensively barred below than last; *hyrcanus* is more greyish-brown than nominate, with pale throat, more extensively barred underparts; *zagrossiensis* resembles previous but paler; *tianschanicus* is also paler and greyer, and with fainter barring; *pallescens* is dull and grey, with long bill; *kurilensis* is darker than last; *fumigatus* has shorter bill than previous; *mosukei* is similar to previous, but darker and more reddish-brown; *ogawae* is darker, duller and more sooty; *taivanus* is greyer and less rufous than last; *magrathi* has dense barring extending over mantle and breast; *neglectus* is similar to previous but darker, with smoky-brown throat; *subpallidus* differs from last in paler coloration; *nipalensis* differs in having still darker plumage; *talifuensis* differs in paler plumage with reduced barring; *szetschuanus* is more olive than previous, with heavier barring; *idius* is smaller and greyer than previous; *dauricus* is similar to last but darker; *seguamensis* is paler and greyer than other Aleutian races, with little or no rufescence on breast and belly; *meligerus* is large, with dull dark, dusky brown upperparts; *kiskensis* is similar to previous, but lighter and less rufescent above; *tanagensis* is longer-winged, and lighter and less rufescent above, than last; *alascensis* is large, bill medium length, throat and breast medium brown; *petrophilus* is like previous but sooty greyish below; *stevensoni* is similar to previous, but underparts still more sooty grey; *semidiensis* is also similar, but with darker and more grey upperparts; *ochroleucus* is rather small and pale (less rufous than *pacificus*), with lighter flanks; *helleri* has longer bill, upperparts medium-brown; *pacificus* has short bill, rufous-brown throat, dark rufous-brown upperparts; *obscurior* is darker and less rufescent than previous; *muiri* is small and pale, with fewer vermiculations than other W American races; *hiemalis* is more reddish-buff than nominate and with heavier flank barring; *pullus* is more reddish above than last, and has shorter bill. Voice. Male has remarkable song, long and complex, a series of tinkling trills one after the other for seconds on end; female not known to sing. In North America two different singers, those in E with simpler songs and smaller repertoires than those in W (non-learnt calls also differ between East and West); also, races in Old World sing differently from those in America. Calls include various sharp "tac" notes and loud churrs; in America, sharp, high-pitched note in W but lower-pitched, richer note in E.

Habitat. Very varied. In North America, breeds primarily in boreal moist coniferous forest with extensive understorey; also on offshore islands with very stunted vegetation. In Old World more catholic in habitat selection, but still almost exclusively in damp situations; in W Europe, commonest in deciduous and mixed woodland, well-vegetated suburbs, urban parks and gardens, moorland scrub, and offshore islands with very scanty cover. In some parts of range more restricted; e.g. in N Africa found mostly in forested stream valleys at elevations of 1200–1800 m. From sea-level to above-tree-line; to 4575 m in Himalayas.

Food and Feeding. Bulk of food invertebrates; arthropods, including spiders (Araneae), beetles (Coleoptera), earwigs (Dermaptera), orthopterans, etc. Also small invertebrates, such as small fish, tadpoles and young frogs. Some vegetable matter, including various berries and some seeds; sometimes seaweed. Usually forages low in vegetation, singly or in pairs; will also flycatch, and has been seen to wade in shallow water, immersing head in search of prey. Recorded also as associating with foraging badgers (*Meles meles*), capturing prey disturbed by them.

Breeding. Egg-laying from late Mar or early Apr in W Europe, a week or more later in C Europe, early Apr to May in Cyprus, and second half May in European Russia; in Canada, from mid-May to mid-Jun in Ontario, late Jun in Labrador; from late May to Jul in Alaska; usually double-brooded in Britain, double-brooded in Israel, and two or sometimes three broods in W North America. Polygamy quite frequent in some W European populations; apparently less so in America, but in one Alaskan study (of race *pacificus*) majority of males nested polygynously at one site with abundant food resources, whereas polygyny was rare at others. Nest domed, with side entrance hole, made of grass and fibres (often wet when placed in position, giving very tight structure on drying), average dimensions c. 11·3 cm high, 13 cm wide and 14·5 cm deep, internal chamber 6·2 cm in diameter and 5·6 cm high; male builds surplus nests, female selects the one to be used and adds lining herself; located in variety of sites, frequently in dense vegetation but also in cavity or crevice, often artificial, as well as odd sites such as pocket of a hanging coat, in rocky locations often in crevice in rock face, on St Kilda (race *hirtensis*) often in crevice in ruin; usually low down, although race *pacificus* in SE Alaska occasionally as high as 18 m in moss-covered tree in response to heavy predation by American red squirrels (*Tamiasciurus hudsonicus*); nest may be reused in subsequent years, sometimes by individuals other than original builders. Clutch 3–9 eggs, usually 5–8, larger clutches (of up to 17) probably the result of two females laying in one nest, island races tend to lay smaller clutches; eggs clear white, spotted with pale brown or reddish-brown, especially around blunt end, more rarely almost immaculate, race *meligerus* (W Aleutian Is) pure unspotted white; incubation by female alone, period c. 16 days; young fed by both parents, brooded only by female, nestling period 14–19 days, average c. 17 days; fledglings cared for for a further 9–18 days before becoming totally independent. Nests parasitized only rarely, by cuckoos (*Cuculus*) in Old World and Brown-headed Cowbird (*Molothrus ater*) in America.

Movements. Resident, migratory and partially migratory. Movements nocturnal. In Britain and Ireland largely sedentary, with most ringing recoveries showing movements of 50 km or less, although several recoveries from S coast into C & S France; races on offshore islands in Britain largely sedentary, but one record of *zetlandicus* from mainland Scotland (Aberdeenshire). N populations in continental Europe highly migratory; individuals ringed in Norway, in Sweden and on E Baltic coast recovered in, respectively, Belgium and Germany, S Spain, and SW France; largely absent from Scandinavia and N European Russia in winter. Farther S in Europe, movements seem to be mostly altitudinal in nature. In E Asia, breeding areas in E Siberia, Kamchatka and Sakhalin vacated in winter, but island populations appear to be sedentary; in C Asia most movements altitudinal, although detailed data lacking. Most North American populations migratory, and majority of breeding range in E & C parts of the continent, as far W as interior British Columbia, vacated in winter, non-breeding range of E populations reaching as far S as NE Mexico; apparently sedentary in coastal W North America and island groups of Alaska, with some altitudinal movement in mountains; no very informative ringing recoveries in North America.

Status and Conservation. Not globally threatened. Common or abundant over much of range. European population estimated at 20,500,000–26,500,000 pairs, of which at least 7,000,000 in UK. Some island populations may be very small; for example, totals of singing males of *fridariensis* on Fair Isle (7·6 km²) have oscillated between ten and 50. Designation of St Kilda race *hirtensis* as a separate species in 1884 led to a frenzy of collecting activity, although this did not, in all likelihood, put the race in serious danger; it currently numbers 200–300 pairs. Estimates of *borealis* (Faroe Is) are in the region of 250–500 pairs. No recent published population estimates for isolated Aleutian races. In Japan, race *mosukei* (Izu Is) is listed as Endangered, and *orii* (Daito Is) has recently become extinct. Generally, a highly successful species. Has great ability, especially in Europe, to adapt to modified habitat, and at peaks of abundance may be one of the three commonest species in Britain. Hard winters with prolonged snow cover can cause catastrophic declines in numbers in non-migratory populations, but these normally very temporary, and recovery typically very swift.

Bibliography. Adamian & Klem (1999), Ali & Ripley (1998), Ammermann (1975), Armstrong (1953, 1955), Armstrong & Whitehouse (1977), Aspinall & Aspinall (1987), Bent (1948), Berthold (2001), Biswas (1955), Brackenbury (1982), Brand & George (2001), Brazil (1991), Bremond (1968, 1978), Brenowitz & Kroodsma (1996), Campbell *et al.* (1997), Catchpole & Rowell (1993), Collar (2004c), Collinson (2002), Conway (2002), Cramp (1988), Dallmann (1977), De Santo *et al.* (1998, 2003), Dementiev *et al.* (1968), Drovetski *et al.* (2004), Étchécopar & Hüe (1964, 1983), Evans, M.I. (1994), Evans, M.R. (1997), Evans, M.R. & Burn (1996), Flint & Stewart (1992), Garret & Dunn (1998), Garson (1978, 1980), Garson & Hunter (1979), Gerss (1995), Grisser & Jean-Yves (1993), Gryczynska *et al.* (2004), Handrinos & Akriotis (1997), Haneda & Norio (1973), Hawthorn & Mead (1975), Heath & Evans (2000), Heath *et al.* (2000), Heinroth & Steinbacher (1952), Hejl & Holmes (2000), Hejl *et al.* (2002), Hellmayr (1934), Herkert & Glass (1998), Hino (2000), Howell & Webb (1995), Hüe & Étchécopar (1970), Inozemtsev (1964), Jenni & Raffael (1983), Jones, S.L. (1998), Keith *et al.* (1992), King, H.(1969), King, W.B. (1978/79), Knystautas (1993), Kogut & Kovalyuk (1994), Kroodsma (1980), Kroodsma & Momose (1991), László *et al.* (2000), Lenz (2002), Literák *et al.* (2001), Liu Huanjin & Su Hualong (1988), Lovaty (2002), MacKinnon & Phillipps (2000), Marchant *et al.* (1990), Mathevon *et al.* (1996), McGowan *et al.* (2004), Moritz (1984), Newton *et al.* (1998), Oberholser (1919), Paz (1987), Peach *et al.* (1995), Phillips & Black (1956), Purroy (1997), Purroy & Purroy (2003), Rice *et al.* (1999), Roberts (1992), Rohdich (2000), Sage (1956), Smythies (1986), Snow & Perrins (1998), Stepanyan (1990), Sterwerf (2004), Tellería *et al.* (1999), Thévenot *et al.* (2003), Tomek (1992), Udvardy (1963), Van Horne & Bader (1990), Vansteenwegen (1997), Vaurie (1951, 1955, 1959), Waterhouse (1998), Weggler & Widmer (2000), Wesolowski (1983), Williamson (1958a), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002), Zimin (1973).



PLATE 42

inches 3

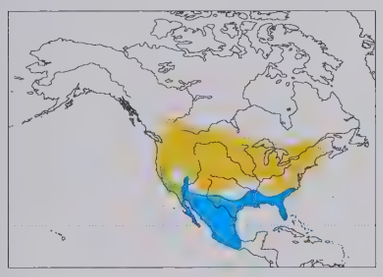
cm 8

60. Northern House Wren

Troglodytes aedon

French: Troglodyte familier **German**: Nördlicher Hauszaunkönig **Spanish**: Chochín Criollo
Other common names: House Wren (when combined with other members of superspecies)

Taxonomy. *Troglodytes aëdon* Vieillot 1809, "North America" = New York City, USA.
Forms a superspecies with *T. brunneicollis*, *T. musculus*, *T. tanneri*, *T. beani* and *T. cobbi*; all have often been treated as conspecific, as suggested by field observations, but recent DNA analyses indicate that present species and first two are three separate species; the others, isolated on islands, likely also to be distinct. Intergrades with *T. brunneicollis* in S Arizona. Birds breeding in E part of range (from Michigan and Quebec S to Kentucky and West Virginia) described as race *baldwini*, but poorly differentiated from, and therefore merged with, nominate. Species name *domesticus* has priority, but use of *aedon* almost universal; this has led to the proposal that the name *domesticus* be officially suppressed in order to favour stability in nomenclature. Two subspecies recognized.
Subspecies and Distribution.
T. a. parkmanii Audubon, 1839 – breeds S Canada (British Columbia E to W Ontario) S to extreme NW Mexico (N Baja California) and in USA to W Texas and W Kentucky; non-breeding from SW & S USA (California and Texas) S to S Mexico (S to Oaxaca).
T. a. aedon Vieillot, 1809 – breeds SE Canada (Ontario E to S Quebec) and S in USA to Kentucky and Virginia; non-breeding SE USA (Carolinas S to Texas) and NE Mexico.



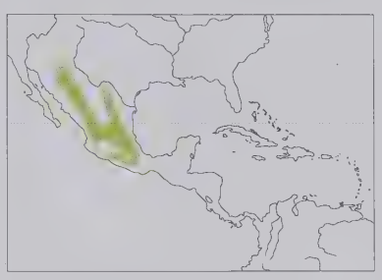
Descriptive notes. 11·5–12·5 cm; 8·9–14·2 g. Nominate race variable: side of face grey-brown, obscurely mottled; crown and upperparts medium brown to grey-brown, becoming warmer brown on back and rump, with obscure darker bars; primaries and secondaries barred buff and dark brown on outer webs, tertials with barring across both webs; rectrices rufescent brown, narrowly barred dark brown; throat and chest buffy white to greyish-white, lower underparts more rufous-buff to greyish-buff, belly greyish-white, undertail-coverts barred off-white and dark brown; eye brown; bill dusky brown above, pale horn below; legs dark brown. Sexes similar. Juvenile has dusky mottling on breast, indistinct barring on flanks. Race *parkmanii* is larger, paler and greyer than nominate. Voice. Male has large repertoire of songs, each a bubbling, cascading series of complex phrases, given especially persistently both by unmated male and by already mated male attempting to attract additional female to nest-site; female also sings, usually a shorter sequence, occasionally identical to male. Various low short calls, churrs and rattling notes, also high squeaky calls.
Habitat. Quite varied. Generally semi-open country, including forest edge, second growth, abandoned farmland, orchards and well-vegetated suburban areas; in open woodland, both deciduous and coniferous, in W of range. Sea-level to 3000 m.
Food and Feeding. Food predominantly invertebrates, including bugs (Hemiptera), caterpillars, grasshoppers (Orthoptera), beetles (Coleoptera), spiders (Araneae) and others; vegetable matter only a minor component (2% of diet). Forages generally low down in tangled vegetation. Frequently destroys eggs of other species, especially cavity-nesters (occasionally to extent that it may be a limiting factor on populations of the victimized species), but appears not to eat these eggs routinely.
Breeding. Season May–Aug; single-brooded at N edges of range and at higher altitudes, two broods, occasionally three, farther S. Generally monogamous, but in some populations significant amount of polygamy, especially when surplus nest-sites available; although secondary females less successful than those in monogamous pairing, some females seem preferentially to choose already mated males. Cavity-nester; nest base built by male, of coarse twigs, on which female builds cup lined with hair, wool and feathers, usually filling cavity almost to the top; natural sites include woodpecker (Picidae) hole, cavity in tree, disused hanging nest of Northern Oriole (*Icterus galbula*), mud nest of Cliff Swallow (*Petrochelidon pyrrhonota*), burrow of Belted Kingfisher (*Megaceryle alcyon*) and base of Osprey (*Pandion haliaetus*) nest, but in many areas majority are in artificial sites, including nestboxes and other cavities; male builds surplus nests, not used for breeding. Eggs 4–8, rarely 3–10, white, pinkish or greyish-white with small reddish-brown or lavender spots and blotches; incubation by female alone, period 12–14 days; chicks fed by both sexes, nestling period 16–18 days; young cared for by parents for up to 13 days after fledging.
Movements. Migratory; occurs throughout year only in extreme SW of breeding range (S California). Ringing returns indicate that those breeding in Ontario and E USA migrate SW & S to wintering areas in S states from Texas E to Georgia and N Florida (those from E seaboard move S to Florida), whereas birds breeding in Prairie Provinces and Great Plains tend to have a more SE displacement in winter; no recoveries of any significance involving birds from Pacific drainage. Nocturnal migrant; leaves non-breeding grounds in late Apr or early May, earlier in S Mexico, and arrives at N limits of breeding area by mid-May. Recorded as vagrant in Cuba.
Status and Conservation. Not globally threatened. Abundant in much of its range. Breeding Bird Surveys over the last 30 years indicate a steady increase in population of c. 1·6% per annum. Has clearly benefited from many man-made habitat changes, from the clearing of forest for agriculture to the provision, either deliberately or inadvertently, of nest-sites. Has expanded its range historically; for example, colonized West Virginia in late 19th century and South Carolina by 1940s.
Bibliography. Albrecht (2000), Álvarez-López *et al.* (1984), Alworth & Scheiber (2000), Anon. (1998b), Arguedas & Parker (2000), Baicich & Harrison (1997), Banks & Browning (1995), Bart & Tornes (1989), Belles-Isles & Picman (1986a, 1986b, 1987), Bent (1948), Brenowitz & Kroodsma (1996), Browning & Banks (1996), Brumfield & Capparella (1996), Burns (1983), Campbell *et al.* (1997), Cavitt & Thompson (1997), Contreras (1997), Creaser (1925), Cyr & Larivée (1995), Dailey (2003), DeGraaf & Rappole (1995), Dobbs *et al.* (1998), Drilling (1984), Drilling & Thompson (1988, 1991), Dubois & Getty (2003), Ellis *et al.* (2001), Finke (1985), Finke *et al.* (1987), Freed (1981, 1987b, 1991), Garrido & Kirkconnell (2000a), Gilardi & John (1998), Graves (1985a), Grove (1981), Guinan & Sealy (1987), Harrison (2003), Hellmayr (1934), Hendricks & Hendricks (1995), Howell & Webb (1995), Hutto (1980), Johnsgard (1979), Johnson (1998), Johnson & Searcy (1993), Johnson, Hicks & Masters (2002), Johnson, Kermott & Lein (1993, 1994), Johnson, Robin & Dellone (2004), Kattan (1993, 1996), Kendeigh (1963), Kendeigh *et al.* (1956), Kennedy (1990), Lago *et al.* (2000), Lanyon (1960), Luttenton (1989), McCabe (1965), Morrison & Johnson (2002), Muller *et al.* (1997), Pacejka (1995), Pacejka & Thompson (1996), Peck & James (1997), Poirier *et al.* (2003), Price *et al.* (1995), Quinn & Holroyd (1989, 1992), Ridgway (1904), Root (1988), Sealy *et al.* (1997), Sherman (1925), Singleton & Harper (1998), Skutch (1985b), Small (1994), Soukup & Thompson (1997), Styrsky *et al.* (2002), Sydlik (1981), Taylor *et al.* (1983), Verner & Purcell (1999), White & Kennedy (1998), Winnett-Murray (1987), Young (1994a, 1994b).

61. Brown-throated Wren

Troglodytes brunneicollis

French: Troglodyte à gorge brune **German**: Fahlkehl-Zaunkönig **Spanish**: Chochín Gorgicafé
Other common names: Brown-throated House Wren

Taxonomy. *Troglodytes brunneicollis* P. L. Sclater, 1858, La Parada, six leagues [c. 25-30 km] from Oaxaca city, Mexico.
Forms a superspecies with *T. aedon*, *T. musculus*, *T. tanneri*, *T. beani* and *T. cobbi*; all have often been treated as conspecific, as suggested by field observations, but recent DNA analyses indicate that present species and first two are three separate species; the others, isolated on islands, likely also to be distinct. Intergrades with *T. aedon* in S Arizona. Birds from NC Mexico were separated as race *compositus*, but apparently on basis of merely individual variation. Three subspecies recognized.
Subspecies and Distribution.
T. b. cahooni Brewster, 1888 – S USA (S Arizona) and C Mexico (S to Zacatecas and Michoacán).
T. b. brunneicollis P. L. Sclater, 1858 – E Mexico from San Luis Potosí and Hidalgo S to Oaxaca.
T. b. nitidus Nelson, 1903 – Mt Zempoaltepec, in Oaxaca.



Descriptive notes. 11·5–12·5 cm; 9·7–11·8 g. Nominate race has buff supercilium, ear-coverts mottled grey-brown; dark greyish-brown crown, warmer brown back and rump with obscure darker barring; primaries and secondaries barred medium brown and blackish-brown, rectrices warm brown with narrow darker bars; chin and throat grey-brown mottled greyish-buff, chest warm buff-brown, flanks rufous-brown with dark bars, belly whitish; eye dark brown; bill blackish-brown above, paler brown below, legs brown. Distinguished from very similar *T. aedon* by buff supercilium, more buffy underparts. Sexes similar. Juvenile similar to adult but more uniform below, with only faint dark markings. Race *cahooni* is greyer above and paler below than nominate; *nitidus* is deeper in colour than nominate. Voice. Song a bubbling, cascading series of trills and rattles, very similar to that of *T. aedon*, sometimes with initial high trill; also a bright springy trill, reminiscent of that of *Salpinctes obsoletus*.
Habitat. Open mountain forests and forest edge of various types, in N of range including ponderosa pine (*Pinus ponderosa*) woodland; pine–oak (*Pinus–Quercus*) forest in much of range. 1600–3000 m.
Food and Feeding. No published data on food items. Generally forages low down in vegetation.
Breeding. Very little documented. Nest a stick base and a cup of finer material, built in cavity in tree such as sycamore (*Platanus*) or oak. No information on clutch size; eggs white or greyish-white with blotches and speckles of brown or reddish-brown, identical to those of *T. aedon* (despite some published statements to the contrary). No other information.
Movements. Apparently sedentary; possibly some minor altitudinal movements in N of range.
Status and Conservation. Not globally threatened. Abundant in many parts of its range. Can tolerate some disturbance of habitat, provided that substantial cover allowed to remain.
Bibliography. Binford (1989), Blake (1953), Blake & Hanson (1942), Brumfield & Capparella (1996), Burleigh & Lowery (1942), Hellmayr (1934), Howell & Webb (1995), Lanyon (1960), Marshall (1956), Oberholser (1904), Phillips *et al.* (1964), Rice *et al.* (1999), Ridgway (1904), Rogers (1981), Rowley (1966), Russell & Monson (1998), Sousa *et al.* (1982), Udvardy (1963), Urban (1959), Young (1994b).

62. Southern House Wren

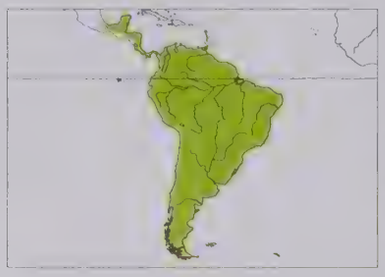
Troglodytes musculus

French: Troglodyte austral **German**: Südlicher Hauszaunkönig **Spanish**: Chochín Ratón
Other common names: House Wren (when combined with other members of superspecies); Antillean House Wren ("*martinicensis* group")

Taxonomy. *Troglodytes musculus* J. F. Naumann, 1823, Bahia, Brazil.
Forms a superspecies with *T. aedon*, *T. brunneicollis*, *T. tanneri*, *T. beani* and *T. cobbi*; all have often been treated as conspecific, as suggested by field observations, but recent DNA analyses indicate that present species and first two are three separate species; the others, isolated on islands, likely also to be distinct. The six Lesser Antilles races of present species (the "*martinicensis*" group) possibly warrant separation as an additional full species. Race *martinicensis* (Martinique) presumed extinct. Twenty-five extant subspecies recognized.
Subspecies and Distribution.
T. m. intermedius Cabanis, 1861 – S Mexico (SE Oaxaca, Tabasco) S to C Costa Rica.
T. m. inquietus S. F. Baird, 1864 – extreme SW Costa Rica and Panama (E to Darién).
T. m. carychrous Wetmore, 1957 – Coiba I, off S Panama.
T. m. pallidipes A. R. Phillips, 1986 – Pearl Is (San Jose and Pedro González, possibly also Bayoneta and Santelmo), off SE Panama.
T. m. guadeloupensis (Cory, 1886) – Guadeloupe, in N Lesser Antilles.
T. m. rufescens (Lawrence, 1877) – Dominica.
T. m. mesoleucus (P. L. Sclater, 1876) – St Lucia.
T. m. musicus (Lawrence, 1878) – St Vincent.
T. m. grenadensis (Lawrence, 1878) – Grenada, in S Lesser Antilles.
T. m. tobagensis Lawrence, 1888 – Tobago.
T. m. atopus Oberholser, 1904 – N Colombia.
T. m. effutitus Wetmore, 1958 – NE Colombia (Guajira Peninsula and extreme NE Magdalena).
T. m. striatulus (Lafresnaye, 1845) – W & C Colombia and W Venezuela.
T. m. columbae Stone, 1899 – E Andes in Venezuela and Colombia.
T. m. clarus Berlepsch & Hartert, 1902 – Venezuela (except W), Trinidad, the Guianas and E Colombia S to NE Peru and N & W Brazil.

On following pages: 63. Clarion Wren (*Troglodytes tanneri*); 64. Cozumel Wren (*Troglodytes beani*); 65. Cobb's Wren (*Troglodytes cobbi*).

T. m. albicans Berlepsch & Taczanowski, 1884 – SW Colombia and W Ecuador.
T. m. musculus J. F. Naumann, 1823 – C, E & S Brazil (S to Mato Grosso), E Paraguay & NE Argentina (Misiones).
T. m. bonariae Hellmayr, 1919 – NE Argentina, Uruguay and extreme SE Brazil.
T. m. puna Berlepsch & Stolzmann, 1896 – N & E Peru and NW Bolivia.
T. m. audax Tschudi, 1844 – arid W coast of Peru (from Trujillo S to Pisco).
T. m. carabayae Chapman & Griscom, 1924 – C & S Peru (Junín S to Puno).
T. m. tecellatus d'Orbigny & Lafresnaye, 1837 – extreme SW Peru and N Chile (Lluta Valley).
T. m. rex Berlepsch & Leverkühn, 1890 – C & E Bolivia, N Argentina and W Paraguay.
T. m. atacamensis Hellmayr, 1924 – N Chile.
T. m. chilensis Lesson, 1830 – from C Chile (S from Aconcagua) and C Argentina S to Tierra del Fuego.



Descriptive notes. 11·5–12·5 cm ; c. 12 g. Nominate race has lores and ear-coverts grey-brown, obscure postocular supercilium paler grey-brown; crown greyish-brown, back warmer brown, rump rufous-brown; shoulders, upperwing-coverts and tertials rufous-brown with darker transverse bars; primaries and secondaries barred with warm buff-brown and darker brown; rectrices rufous-brown with narrow darker bars; chin, throat and chest pale buffish-brown, flanks warmer buff-brown; eye brown; bill dark brown, paler base; legs brown or pinkish-brown. Sexes similar. Juvenile has conspicuous darker scalloping on underparts from chin to belly. Race *puna* is larger than nominate, with deeper cinnamon-buff underparts; *clarus* has paler underparts than nominate; *tobagensis* is similar to previous but with longer wings, heavier bill, whiter underparts; *carabayae* is also similar, but back has distinct narrow darker bars, underparts buffer; *striatulus* is larger and more greyish-brown than nominate, more whitish below; *atopus* is similar to previous but deeper ochraceous below; *effutitus* resembles last, but paler above and below, more greyish-brown on back, lighter brown rump and uppertail-coverts; *albicans* is smaller, with warmer rufous upperparts, sandy-coloured underparts; *columbae* has darker greyish-brown upperparts finely barred dusky, darker underparts; *audax* is warm rufous above, most like *albicans* but with longer tail, more uniformly ochraceous underparts; *tecellatus* is similar to previous, but more greyish above, distinct broad blackish bars on back; *bonariae* is brownish-grey above with faint darker barring on back, while rump and tail less rufescent than in most other races, pale isabelline on most of underparts, with barring restricted to undertail-coverts; *chilensis* has paler upperparts than previous; *atacamensis* is very similar to previous, but with longer and more slender bill, paler upperparts without bars; *rex* is also similar, but with longer and heavier bill, brighter isabelline underparts; *intermedius* differs from nominate in having ventral surface uniform deep cinnamon-buff; *carychrous* is overall brighter in colour than previous; *inquietus* is larger, less buff below and more grey above; *pallidipes* is similar to last, but more rufescent on flanks and rump; *mesoleucus* has strong rufescent tinge above, white underparts; *musicus* is larger than previous, more rust-coloured above, back with obscure darker bars; *guadeloupensis* is smaller and more rufous above than last; *grenadensis* is closest to previous but larger and paler, with no bars on back; *rufescens* resembles last, but overall much darker, crissum with dark bars. Voice. Male song a rather variable series of rapid notes, sometimes preceded by slower warbling sequence, resembles that of *T. aedon*; in S parts of range tends to conclude with a series of harsh rising notes. Female song distinct, a low, rapid twittering, at times followed by high clear trill. Call (at least in Ecuador) a nasal "jeeyah", differing from that of *T. aedon*; alarm calls also differ from latter's.

Habitat. Very varied; generally, in open or semi-open bushland, forest edge and clearings, abandoned farmland, hedgerows, scrub, around settlements and in well-vegetated suburban areas. Generally absent from unbroken forest, but rapidly colonizes rough clearings. From sea-level up to 4000 m.

Food and Feeding. Food seems to consist largely or entirely of invertebrates; observed prey items include caterpillars, spiders (Araneae), crickets and grasshoppers (Orthoptera), cockroaches (Blattodea), bugs (Hemiptera) and wasps (Hymenoptera). Generally forages low down in tangled vegetation; will also examine lower levels of tree trunks in manner of a woodcreeper (Dendrocolaptidae).

Breeding. Season very protracted in tropical parts of range, in every month except Oct and Nov in Costa Rica, more or less throughout year in Suriname (peaks in Jan and Jul) and Trinidad (peak May); austral spring in temperate South America, e.g. in Oct and Nov in Uruguay, and in Chile from Aug in N and from Sept in S, Oct–Dec in Argentina; multiple-brooded in tropics, partners usually remaining together for subsequent broods. Generally monogamous; several instances of polygamy recorded in Panama, but in detailed study in Colombia monogamy the invariable rule. Nest a base of coarse twigs, made mostly by male, with cup of finer material added by female, similar to that of *T. aedon*; usually situated in cavity 0·5–11 m above ground, mostly c. 2–3 m, occasionally in shrubbery or even on ground. Clutch 4 eggs (rarely 5) in Costa Rica, 4–5 in Trinidad, 2–4 in Colombia, usually 5 (up to 7) in Argentina; eggs whitish, densely flecked all over with fine brown, reddish-brown or cinnamon (rarely, unmarked white); incubation by female alone, period 14·5–15·5 days, rarely 17 days; young fed by both sexes, fledging period 18–19 days, rarely 17 or 20 days, but in Argentina normally 16–17 days; destruction of nest contents of different paternity by incoming male observed in Panama. Frequently parasitized by Shiny Cowbird (*Molothrus bonariensis*).

Movements. Sedentary in tropical parts of range; in study in Colombia, high degree of permanent faithfulness to breeding sites. Migratory in extreme S South America, but extent of non-breeding range imperfectly known; leaves I Grande (Tierra del Fuego) after breeding, but found throughout year as far S in Chile as Torres del Paine.

Status and Conservation. Not globally threatened. Common or abundant over most of its huge range. Can tolerate, and frequently benefits from, human changes to habitat, such as the clearing of deep forest. In contrast, isolated races in Lesser Antilles (possibly warranting full species status) have suffered severely from habitat destruction and from predation by introduced mongooses (Herpestidae). Thus, *martinicensis* on Martinique presumed extinct, having not been observed since c. 1900; *guadeloupensis* was believed extinct in 1914, but small numbers rediscovered in 1969 and 1973, although not seen recently; tiny population of *mesoleucus* still present on St Lucia in 1984, while on St Vincent *musicus* is uncommon; seems still to be common, at least in some areas, on Grenada (*grenadensis*) and Dominica (*rufescens*).

Bibliography. Alvarez-López *et al.* (1984), Anon. (1997a, 2002a), Arguedas & Parker (2000), Babbs *et al.* (1988), Barlow (1978), Belcher & Smooker (1937), Buzzetti (2000), Canevari *et al.* (1991), Chapman (1929), Cohn-Haft *et al.* (1997), Couve & Vidal-Ojeda (2003), Davies *et al.* (1994), ffrench (1991), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Freed (1986), Graves (1985a), Harris (1998), Haverschmidt (1952, 1968), Haverschmidt & Mees (1994), Hellmayr (1934), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967, 1972), Kattan (1993), Keith (1997), King (1978/79), Koepcke (1963), Lowen *et al.* (1996), Mason (1985), Parker & Goerck (1997), Parker *et al.* (1985), de la Peña (1987, 1989, 1995), Perry *et al.* (1997), Raffaele *et al.* (1998, 2003), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Ridgway (1904), Robbins *et al.* (1985), Schmitt *et al.* (1997), Short (1975), Sick (1993, 1997), Skutch (1953), Slud (1964), Tostain *et al.* (1992), Vuilleumier (1985), Waide (1980), Wetmore (1958), White (2002), Wiedenfeld *et al.* (1985), Williams & Tobias (1994), Young (1994b), Zimmer, J.T. (1930), Zimmer, K.J. *et al.* (1997).

63. Clarion Wren

Troglodytes tanneri

French: Troglodyte de Clarion **German**: Clarionzaunkönig **Spanish**: Chochín de la Clarión

Taxonomy. *Troglodytes tanneri* C. H. Townsend, 1890, Clarión Island, in Revillagigedo Group, off west Mexico.
Forms a superspecies with *T. aedon*, *T. brunneicollis*, *T. musculus*, *T. beani* and *T. cobbi*, and all often treated as conspecific. Monotypic.
Distribution. Clarión I, in Revillagigedo Group, off W Mexico.



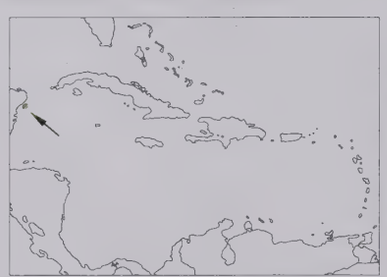
Descriptive notes. 12·5–14 cm. Has grey-brown lores, buffy-white supercilium, grey-brown ear-coverts obscurely mottled lighter brown; crown and nape dull blackish-brown, back dull grey-brown, rump rufescent brown; primaries and secondaries barred light and dark brown on outer webs; rectrices alternately barred dark brown and greyish-brown; throat and chest buffy white, lower belly and flanks deeper buff; eye brown; bill dark brown, pale horn-brown base; legs brownish. Sexes similar. Juvenile has underparts faintly scalloped brownish. Voice. Song usually begins with 2 or more gruff "chut" notes, then continues as a warble, resembles that of *T. aedon*, lower and with more gruff chattering than song of *T. sissonii*; prolonged scratchy warble in post-breeding period. Call a dry, insect-like churring rattle.
Habitat. Arid scrub and cactus bush.
Food and Feeding. No published information.
Breeding. Probably breeds in Jan; numerous flying young seen in May. One nest described in 1898 as being made of material such as is used by *T. aedon*, but in shape and location like that of a Song Sparrow (*Melospiza melodia*), i.e. an open cup on ground; several nests found in 1990, each in radiator or glove compartment of derelict vehicle, no other details. No other information.
Movements. Sedentary.
Status and Conservation. VULNERABLE. Confined entirely to Clarión I, a small island (8 km long) in Revillagigedo Group, off W Mexico; described in 1898 as "not uncommon". Notwithstanding substantial habitat change, caused by burning and the introduction of goats, hares (*Lepus*) and pigs, it seems still to be reasonably common. Recent population estimates of 170–200 pairs; density seems to be greater near buildings than elsewhere on island. The Revillagigedo Archipelago is now a Biosphere Reserve, with strictly controlled access.
Bibliography. Anon. (1998b), Anthony (1898), Arizmendi & Márquez (2000), Baptista & Martínez (2002), Blake (1953), Brattstrom & Howell (1956), Collar & Andrew (1988), Collar *et al.* (1994), Everett (1988), Hellmayr (1934), Howell & Webb (1989, 1995), Johnson & Stattersfield (1990), Ridgway (1904), Santaella & Sada (1991), Stattersfield & Capper (2000).

64. Cozumel Wren

Troglodytes beani

French: Troglodyte de Cozumel **German**: Cozumelzaunkönig **Spanish**: Chochín de Cozumel
Other common names: Cozumel House Wren

Taxonomy. *Troglodytes beani* Ridgway, 1885, Cozumel Island, Quintana Roo, Mexico.
Forms a superspecies with *T. aedon*, *T. brunneicollis*, *T. musculus*, *T. tanneri* and *T. cobbi*, and all often treated as conspecific. This species possibly closest to Lesser Antilles races ("*martinicensis* group") of *T. musculus*. Monotypic.
Distribution. Cozumel I (Quintana Roo), off SE Mexico.



Descriptive notes. 12–12·5 cm. Has crown warm grey-brown, becoming rufescent brown on back and warm rufous-brown on rump; upperwing-coverts rufescent brown; primaries and secondaries barred dark brown and rufous-brown on outer webs; rectrices deep rufous-brown with narrow darker bars; throat and chest buffy white, flanks grey-buff, lower flanks rufous-buff; eye brown; bill brown, pale base; legs brown or pinkish-brown. Sexes similar. Juvenile undescribed. Voice. Song typically begins with scolding "chih-chih", breaking into short rich warble, then ending with bright "wheet-wheet-wheet-wheet", resembles that of *T. musculus* but fuller and richer, without trills, and often interspersed with persistent "wha-wha" note. Calls include scolding "shch-shch" and rolled "jirr-r-r-r".
Habitat. Brushland, farmland edges and broken bush, including areas around habitation.
Food and Feeding. Few data on food items; stomach contents "insects". Forages in bush and tangles.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common in suitable habitat; despite its tiny range (Cozumel is c. 45 km long and 20 km wide), not apparently in any danger. Adapts well to disturbed habitat, provided that some cover remains. Cozumel is subject to hurricanes, which periodically sweep over the island; in contrast to Cozumel Thrasher (*Toxostoma guttatum*), it seems to recover very well from the effects of these.
Bibliography. Arizmendi & Márquez (2000), Hellmayr (1934), Howell & Webb (1995), Klaas (1968), Paynter (1955), Phillips (1986), Ridgway (1904), Wheatley & Brewer (2001).

65. Cobb's Wren

Troglodytes cobbi

French: Troglodyte de Cobb **German**: Falklandzaunkönig **Spanish**: Chochín Malvinero
Other common names: Rock Wren(!)

Taxonomy. *Troglodytes cobbi* Chubb, 1909, Carcass Island, north-west of West Falkland, Falkland Islands.
Forms a superspecies with *T. aedon*, *T. brunneicollis*, *T. musculus*, *T. tanneri* and *T. beani*, and all often treated as conspecific. Present species distinct from others, however, in large size, different plumage and markedly different ecology. Monotypic.
Distribution. Small offshore islands in Falkland Is.



Descriptive notes. 13–14 cm; 17–20 g. Partial albinism, e.g. with some white or grey on head, quite common. Lores, cheeks and ear-coverts are unmarked grey-brown, with no obvious eyestripe or supercilium; crown and nape grey-brown, back and shoulders warmer brown, rump brighter rusty-brown; outer webs of primaries and secondaries barred blackish-grey and warm brown; rectrices warm brown with narrow blackish-grey bars; underparts grey-brown, palest on centre of throat and upper breast, becoming richer and warmer on flanks and vent; eye brown; bill blackish; legs dark brown. Sexes similar. Juvenile is more richly coloured than adult, with buff underparts. Voice. Song, delivered from conspicuous perch on beach boulder or completely hidden site in tussac grass, usually a loud phrase of rapid trills and whistles mixed with low buzzing notes, duration c. 2 seconds; individuals males with distinctive songs varying in pattern, slow trills repeated at 10-second intervals or continuous warbling lasting up to 20 seconds. Call notes harsh and buzzing trills, becoming higher-pitched, staccato and explosive when agitated.
Habitat. Usually associated with tussac grass (*Parodiochloa flabellata*), a characteristic very tall and dense Falkland plant; also occurs away from tussac stands in areas where no introduced predators. Also piles of washed-up kelp on shorelines.
Food and Feeding. Invertebrates; no published data on prey items. Usually forages in tussac grass; also in crevices in boulders and among washed-up kelp on beaches.
Breeding. Only a few nests described. Sept/Oct–Dec, but song heard between late Aug and mid-Apr; probably double-brooded. Strongly territorial during breeding, faithful to territory from year to year. Nest an ovoid ball, with side entrance pointing slightly upwards, made of tussac grass and seal hairs, thickly lined with feathers, usually on or close to ground, maximum height above it 0·9 m, in base of tussac clump, sometimes in rock crevice or beneath large boulder, once in sheepskin hanging on fence. Eggs 3 or 4, pinkish, heavily spotted with red or light brown; no information on incubation and fledging periods.
Movements. Sedentary; the only inter-island movement seems to be between closely adjacent islands.
Status and Conservation. VULNERABLE. Restricted-range species: present in Southern Patagonia EBA. Confined to offshore islands, varying in size from 5 ha to 3000 ha, in Falklands. Total population in late 1990s estimated at 4000–8000 pairs, distributed among c. 31 separate islands; recent observations, however, have extended range to several additional islands. Density can be quite high, with up to 4 territorial males/ha in optimum habitat and 2/ha in less suitable conditions. Probably occurred throughout the archipelago prior to human colonization; in 1771, "great numbers of wrens like those in France" reported near present-day Stanley, on East Falkland, but by 1833–1834, following colonization and the introduction of huge numbers of grazing stock, Darwin saw no wrens at all. Highly vulnerable to introduced predators, especially rats (*Rattus*) and cats, and to the destruction of tussac grass habitat by burning and unwise grazing practices; doubtless, its easily accessible nests add to its vulnerability. Efforts are currently being made to eliminate rats from several of the more suitable islands.
Bibliography. Bennett (1935), Cawkell & Hamilton (1961), Collar *et al.* (1994), Couve & Vidal-Ojeda (2003), Darwin (1839), Hellmayr (1934), Jaramillo (2003), Lowen (2001), Mazar Barnett & Pearman (2001), de la Peña (1989), Pernety (1771), Pettingill (1973), Ridgely & Tudor (1989), Shirihai (2002), Stattersfield & Capper (2000), Woods (1975, 1988, 1993, 2000), Woods & Woods (1997).


PLATE 43
inches 3
cm 8
66
ssp auricularis
67
ssp solstitialis
68
69
ssp ochraceus
70
ssp festinus
ssp browni
72
ssp basultoi
ssp rufulus
71
ssp wetmorei
ssp leucogastra
73
ssp restricta
ssp duidae
ssp festiva
75
74
ssp castanea
ssp leucophrys
ssp anachoreta
ssp brunneiceps
ssp leucosticta
76
ssp costaricensis
77
ssp smithei
ssp prostheleuca

66. Socorro Wren

Troglodytes sissonii

French: Troglodyte de Socorro **German**: Socorrozaunkönig **Spanish**: Chochín de la Socorro
Other common names: Revillagigedo Wren

Taxonomy. *Thryothorus sissonii* Grayson, 1868, Socorro Island, in Revillagigedo Group, off west Mexico.
Although traditionally placed in genus *Thryomanes*, and sometimes in *Thryothorus*, it is generally agreed among ornithologists familiar with this species that it exhibits features typical of present genus; recent work using mitochondrial DNA supports its placement in present genus, close to *T. aedon* and *T. musculus*; in past, considered by some to form a superspecies with *Thryomanes bewickii*, with suggestion that they might even be conspecific. Species name *insularis* commonly used prior to 1951, when *sissonii* was shown to have priority; proposal for treatment of latter as a *nomen oblitum* has generally been ignored, and since 1951 *sissonii* has been used almost universally. Monotypic.
Distribution. Socorro I, in Revillagigedo Archipelago, off W Mexico.



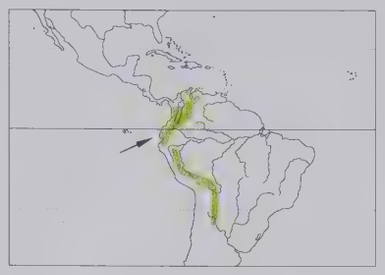
Descriptive notes. 11–12 cm. Has buffy lores, pale buff supercilium, ear-coverts mottled grey-buff; crown grey-brown with some darker feather centres, shoulders and back grey-brown with obscure fine bars, rump warmer brown; outer webs of primaries and secondaries barred blackish-grey and greyish-white; rectrices grey-brown, barred dark greyish-black; chin and throat buffy white, becoming somewhat deeper in colour on chest, belly whitish, flanks and vent buffy; eye dark brown; bill dark brown above, paler below; legs brown. Sexes similar. Juvenile is like adult, but with conspicuous darker scalloping on underparts. Voice. Song usually starts with 2 or more gruff "chuk" notes, breaks into short, rich, slightly scratchy warble and often ends with rich chortle or clear "sweet-weet-weet"; female countersings with male, contributing gruff chatters; song more reminiscent of other *Troglodytes* than of *Thryomanes bewickii*. Scolding "chuk chuk" calls, also rapid "jihr-jihr".
Habitat. Woodland and brushy hillsides.
Food and Feeding. No data available on food items taken. Forages low down in vegetation and also on the ground, turning over leaves; also climbs on tree trunks in the manner of a treecreeper (*Certhia*).
Breeding. Apparently breeds early, though no precise data available; families with fledged young in Apr. One nest was located in knothole of decayed tree, but no further details given. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Socorro Island EBA. Quite common; stated to be the second most abundant bird species on Socorro I. Despite severe ecological damage to the island's habitats, caused primarily by introduced cats and sheep, this species appears not to have suffered to same extent as have other endemic members of the fauna; woodland destruction by sheep may limit its range on parts of the island. Its population is said to have increased as a result of the near-extinction, owing mainly to predation by cats, of Socorro Mockingbird (*Mimodes graysoni*); whether the latter was a predator of small passerines is, however, open to dispute.
Bibliography. Anon. (1998b), Anthony (1898), Arizmendi & Márquez (2000), Banks & Browning (1995), Baptista & Martínez (2002), Blake (1953), Brattstrom & Howell (1956), Collar & Andrew (1988), Grayson (1868), Howell & Webb (1995), Jehl & Parkes (1982), Johnson & Stattersfield (1990), Martínez *et al.* (2005), McLellan (1926), Santaella & Sada (1991), Stattersfield & Capper (2000), Taylor (1951).

67. Mountain Wren

Troglodytes solstitialis

French: Troglodyte montagnard **German**: Andenzaunkönig **Spanish**: Chochín Montañés
Other common names: Equatorial Wren

Taxonomy. *Troglodytes solstitialis* P. L. Sclater, 1859, Matos and Pinipi, near Riobamba, Chimborazo, Ecuador.
Sometimes considered to include *T. monticola*, *T. ochraceus*, *T. rufociliatus* and *T. rufulus* as races; recent DNA work, however, strongly indicates that last three of those, at least, are distinct from present species. Five subspecies recognized.
Subspecies and Distribution.
T. s. solitarius Todd, 1912 – mountains of Colombia (except extreme S) and W Venezuela (Perijá Mts and Andes S from S Lara).
T. s. solstitialis P. L. Sclater, 1859 – extreme S Colombia S to NW Peru.
T. s. macrourus Berlepsch & Stolzmann, 1902 – E slope of Peru S from San Martín.
T. s. frater Sharpe, 1882 – extreme SE Peru (Puno) and Bolivia.
T. s. auricularis Cabanis, 1883 – NW Argentina (S to Tucumán).
Descriptive notes. 10·5–11·5 cm; mean 11·8 g. Nominate race has reddish-brown lores, buff-brown supercilium before and behind eye, area behind eye darker brown, ear-coverts warm buff-brown; crown and forehead rufous-brown, nape, shoulders, back and rump less rufescent; primaries and secondaries barred light rufescent brown and dark chocolate-brown on outer webs; rectrices rufous-brown, narrowly barred blackish; throat and chest warm buff, belly paler buff, flanks buff-brown with indistinct darker barring, vent greyish-white with indistinct darker bars; eye dark brown; bill blackish; legs greyish or greyish-brown. Sexes similar. Juvenile is quite distinct from adult, supercilium less warm buff, upperparts less warm in colour, underparts dull grey-brown, chin to upper belly diffusely speckled dark grey-brown. Race *solitarius* has darker upperparts than nominate, auricular patch deeper brown, throat paler buff, flanks less rufescent, tail longer; *macrourus* is larger and longer-tailed, middle of breast white; *frater* is closest to previous, but with white or buffy-white supercilium; *auricularis* is very similar to last, but with shorter tail, less rufescent upperparts. Voice. Song is rather quiet, a series of high notes, "treee-treeeee-tititiki"; call, constantly given, a characteristic "dzz" or "di-di".



Habitat. Humid forest and forest edge and cloudforest, up to tree-line; sometimes in bamboo thickets. Mostly 1700–3500 m, but down to 700 m in N Argentina.
Food and Feeding. No published data available on food items consumed. Usually in pairs or family parties; occasionally associates with other species in mixed flocks. Forages in low vegetation, sometimes climbing into moss-covered trees.
Breeding. Season quite protracted, varying widely in different parts of range; fledglings observed in almost all months of year in Colombia, Feb–Dec in Peru, Nov and Feb in Bolivia; eggs in Nov in N Argentina; probably multiple-brooded, but confirmation needed. Few observations of nests; one described as a bulky structure, with side entrance but no roof, made of fibrous roots, lined with narrow dry leaves; one in Ecuador located in pile of brush c. 2 m up in crotch of tree, another in natural cavity 10 m up in tree trunk. Clutch 2 eggs, white, but in Argentina reported as 4–5 eggs, whitish with chestnut spots mainly at blunt end; no information available on incubation and fledging periods.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Common or abundant in suitable habitat in much of its range. Occurs in several protected areas, e.g. Sierra Nevada National Park, in Venezuela, and Podocarpus National Park, in Ecuador.
Bibliography. Allen (1998), Babarskas *et al.* (1995), Baez *et al.* (1997), Becker & López (1997), Best *et al.* (1997), Blake (1958), Bloch *et al.* (1991), Canevari *et al.* (1991), Chapman (1917), Chebez *et al.* (1999), Clements & Shany (2001), Cresswell *et al.* (1999), Davies *et al.* (1994), Dobbs *et al.* (1998), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hellmayr (1934), Hennessey *et al.* (2003), Hilty (2003), Hilty & Brown (1986), Kirwan & Marlow (1996), Mazar Barnett & Pearman (2001), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Parker *et al.* (1985), de la Peña (1989), Remsen (1985), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Salaman (1994), Sclater & Salvin (1879), Skutch (1960), Varty *et al.* (1986), Walker (2001), Williams & Tobias (1994).

68. Santa Marta Wren

Troglodytes monticola

French: Troglodyte des Santa Marta **Spanish**: Chochín de Santa Marta
German: Santa Marta-Zaunkönig
Other common names: Paramo Wren

Taxonomy. *Troglodytes monticola* Bangs, 1899, Páramo de Chiruqua, 15,000 feet [c. 4570 m], Santa Marta Mountains, Colombia.
Frequently treated as a race of *T. solstitialis*, although morphologically closer to *T. ochraceus*; relationships with other montane congeners of Central and South America uncertain, and no DNA analysis yet undertaken. Monotypic.
Distribution. Upper elevations in Santa Marta massif, in N Colombia.



Descriptive notes. 11·5 cm. Has buffy supercilium, buffy-white eyering; crown and upperparts rufous-brown, lower back, primaries and secondaries barred blackish; rectrices brown, transversely barred black; chin pale buff, becoming buffy brown on throat and chest, flanks buffy-white with obvious dark brown bars, vent white with blackish bars; eye brown; bill dark brown, paler base; legs brownish. Sexes similar. Juvenile is similar to adult, but with dark feather tips on back and underparts. Voice. No documented information on song; call, constantly given, a characteristic "di-di".
Habitat. Edges of elfin forest, tree-line scrub, *páramo*; 3200–4800 m.
Food and Feeding. No data on prey items. Forages from ground to middle levels; joins mixed-species flocks.
Breeding. No information.
Movements. Apparently sedentary; not known if altitudinal movements occur.
Status and Conservation. Not globally threatened. Restricted-range species: present in Santa Marta Mountains EBA. Known range is largely contained within the Sierra Nevada de Santa Marta National Park. This area now rarely visited by ornithologists, but recent observations in Frío Valley suggest that this species may be under threat; population density appears to be low. Despite supposedly protected status of the area, forest destruction, overgrazing and burning continue almost unabated. More data needed from other parts of the Santa Marta massif. The species' conservation status requires reassessment.
Bibliography. Cracraft (1985), Hellmayr (1934), Hilty & Brown (1986), Ridgely & Tudor (1989), Stattersfield *et al.* (1998), Strewe & Navarro (2004), Todd & Carriker (1922).

69. Ochraceous Wren

Troglodytes ochraceus

French: Troglodyte ocré **German**: Fahlstreif-Zaunkönig **Spanish**: Chochín Ocráceo
Other common names: Irazu Wren

Taxonomy. *Troglodytes* (?) *ochraceus* Ridgway, 1882, Volcán Irazú, Cartago, Costa Rica.

On following pages: 70. Rufous-browed Wren (*Troglodytes rufociliatus*); 71. Tepui Wren (*Troglodytes rufulus*); 72. Timberline Wren (*Thryorchilus browni*); 73. White-bellied Wren (*Uropsila leucogastra*); 74. Grey-breasted Wood-wren (*Henicorhina leucophrys*); 75. Munchique Wood-wren (*Henicorhina negreti*); 76. White-breasted Wood-wren (*Henicorhina leucosticta*); 77. Bar-winged Wood-wren (*Henicorhina leucoptera*).

Formerly considered a race of *T. solstitialis*, but recent DNA work strongly supports treatment as a separate species. Three races recognized.
Subspecies and Distribution.
T. o. ochraceus Ridgway, 1882 – highlands of Costa Rica (Tilarán and Talamanca ranges and mountainous areas in between).
T. o. ligea Bangs, 1908 – mountains of W Panama.
T. o. festinus Nelson, 1912 – Cerro Pirre, in E Panama; possibly also adjacent NW Colombia.



Descriptive notes. 9·5–10 cm; 8–10 g. Nominate race has buff-brown lores, prominent ochraceous buff postocular supercilium, widening posteriorly, ear-coverts contrastingly darker; crown and upperparts rich medium brown, forehead slightly more orange, rump slightly more rufous; primaries and secondaries barred orange-brown and duller dark brown, tertials deep brown with blackish-brown bars; rectrices dull brown, barred blackish-brown; chin, throat and chest buffy brown, lower breast and upper belly buffy white, flanks and lower belly darker buffy brown; eye brown; bill dark brown, pale base of lower mandible; legs brown. Sexes similar. Juvenile has underparts scaled darker brown, supercilium less rich in colour. Race *ligea* is duller above than nominate, with heavier bill; *festinus* is smaller, lighter below than nominate, larger bill. VOICE. Song a rather subdued medley of varied liquid trills and high, thin slurred whistles; calls a rolling, thin high-pitched "peeer" or "peeew" and low, weak "churr".
Habitat. Humid mountain forest with epiphytes, also areas of scattered trees at forest edge in grazed land. Mostly 900–2450 m; rarely, down to 600 m and up to 3000 m.
Food and Feeding. No data available on prey items. Forages mostly on mossy trunks and in epiphytes.
Breeding. Apparently Apr–Jul (nestlings being fed early May, nest construction observed late May) in Costa Rica. Only three nests described, none of which could be examined, but each apparently in cavity of dead branch or among free-swinging epiphytes on broken-off, heavily overgrown branch supported by creepers and aerial roots. Family groups of adults and two young observed. No other information.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Fairly common. Considerable portions of its range lie within national parks, such as those of La Amistad, Tapantí and Volcán Poás, and biological reserves.
Bibliography. Angehr (2003), Anon. (1998b), Blake (1958), Buskirk (1981), Buskirk *et al.* (1972), Hartman & Brownell (1961), Hellmayr (1934), Nadkarni & Matelson (1989), Powell (1979), Ridgely & Gwynne (1989), Ridgway (1904), Robbins *et al.* (1985), Sillett (1994), Skutch (1940, 1960), Slud (1964), Stiles & Skutch (1989), Young *et al.* (1998).

70. **Rufous-browed Wren**

Troglodytes rufociliatus

French: Troglodyte à sourcils roux **Spanish**: Chochín Cejirrufo
German: Rostbrauen-Zaunkönig

Taxonomy. *Troglodytes rufociliatus* Sharpe, 1882, Volcán de Fuego, 10,000 feet [c. 3050 m], Sacatepéquez, Guatemala.
Frequently regarded as conspecific with *T. solstitialis*; recent DNA work, however, strongly indicates that it is a distinct species, and closer to the *T. aedon* superspecies than to other members of the genus in Central and South America. Four subspecies recognized.
Subspecies and Distribution.
T. r. chiapensis Brodkorb, 1943 – high mountains of Chiapas, in S Mexico.
T. r. rufociliatus Sharpe, 1882 – E Guatemala and N El Salvador.
T. r. nannoides Dickey & van Rossem, 1929 – Volcán Santa Ana, in El Salvador.
T. r. rehni Stone, 1932 – mountains of Honduras and NW Nicaragua.



Descriptive notes. 10–11·5 cm; 11 g. Nominate race has buff lores marked with darker brown, pale buff supercilium contrasting with dark brown upper ear-coverts; crown and back warm brown, obscure darker bars on back, rump warm brown with darker bars, shoulders warm brown with some greyish-white streaks; primaries and secondaries barred greyish-black, buff and brown; rectrices warm brown, barred blackish-brown; chin buffy, throat and chest ochraceous buff, deepening on sides to ochraceous tawny with obscure darker barring; flanks barred grey, warm brown and dark brown; centre of belly sometimes obscurely spotted, lower belly and vent barred; eye brown; bill dark horn with pale base to lower mandible; legs dark grey-brown. Sexes similar. Juvenile is like adult, but flank barring more obscure, chest feathers with fine dusky edgings. Race *chiapensis* is darker brown above than nominate, throat richer rufous, belly almost pure white, crissum greyish; *nannoides* is darker on back, barring on flanks heavier; *rehni* is more reddish-brown above, throat ochraceous, belly buffy. VOICE. Song a varied, scratchy warble running into tinkling trill; call a loud nasal "zhweet".
Habitat. Wet epiphyte-laden mountain forest; in El Salvador, found only in dampest, darkest sections of cloudforest. More varied habitat, including mixed oak–pine (*Quercus–Pinus*) forest and epiphytic cypress (*Cupressus*) forest, in Guatemala.1700–3500 m; recently found at 1250 m in Nicaragua.
Food and Feeding. Few data available on food items consumed; has been seen to take caterpillars. Forages, usually in pairs, low down in thick epiphytes and piles of brush; also in epiphytes on tree branches.
Breeding. Nests from third week Apr to early Jul in Guatemala; birds in breeding condition in May in El Salvador. Only three nests described, all from Guatemala: a cup made of dry grasses and pine needles, located in cavity in dead tree stump (the highest 1 m up) or in hole in ground; 3 eggs, white, speckled all over with cinnamon; incubation by female alone, sometimes fed on nest by male (unusual for a wren). No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in the North Central American Highlands EBA. Quite common in many areas where habitat undisturbed. Race *nannoides* now restricted to 600-ha area of Volcán Santa Ana (El Salvador), which is in a national park; total population of this race estimated at c. 4000 individuals.
Bibliography. Anon. (1998b), Arizmendi & Márquez (2000), Blake (1953), Dickey & van Rossem (1938), Gómez de Silva *et al.* (1999), Hellmayr (1934), Howell & Webb (1995), Komar (1998, 2002), Komar *et al.* (1998), Land (1970), Martínez-Sánchez (1989), Monroe (1968), Rice *et al.* (1999), Ridgway (1904), Skutch (1940, 1960, 1985b), Wetmore (1941), Wheatley & Brewer (2001).

71. **Tepui Wren**

Troglodytes rufulus

French: Troglodyte des tépuis **German**: Tepuizaunkönig **Spanish**: Chochín de Tepuí
Other common names: Roraima Wren

Taxonomy. *Troglodytes rufulus* Cabanis, 1849, Cerro Roraima, Bolívar, Venezuela.
Sometimes regarded as conspecific with *T. solstitialis*, but recent DNA work indicates that it is a separate species. Six subspecies recognized.
Subspecies and Distribution.
T. r. yavii Phelps, Sr & Phelps, Jr, 1949 – tepuis of N Amazonas (Sipapo, Guanay, Yavi), in S Venezuela.
T. r. marahuacae Phelps, Jr & Aveledo, 1984 – Cerro Marahuaca, in C Amazonas.
T. r. duidae Chapman, 1929 – tepuis of C Amazonas (Duida, Parú, Huachamacari) and S Bolívar (Jaua, Sarisariñama).
T. r. wetmorei Phelps, Sr & Phelps, Jr, 1955 – Cerro de la Neblina, in S Amazonas, presumably also in immediately adjacent N Brazil.
T. r. fulvigularis J. T. Zimmer & Phelps, Sr, 1945 – Auyán-tepui, Ptari-tepui, Chimantá-tepui and Sororopán-tepui, in SE Bolívar.
T. r. rufulus Cabanis, 1849 – subtropical zones of Mt Roraima and Uei-tepui, on Venezuela–Guyana border, presumably also in immediately adjacent N Brazil.



Descriptive notes. c. 11·5–12 cm; 16 g. Nominate race has grey lores, ochraceous buff supercilium, dark brown postocular area; crown and upperparts unmarked chestnut-brown, slightly more rufescent on lower back and rump; primaries and secondaries rather obscurely barred rufous-brown and blackish-brown on outer webs; rectrices dark rufous-brown with narrow blackish bars; throat and breast ochraceous buff deepening to rufous brown on sides, falnks and rear belly; vent buffy-brown, barred dark brown; eye dark brown; bill black, silvery base of lower mandible; legs medium grey. Sexes similar. Juvenile is darker, with underparts scaled. Race *wetmorei* is similar to nominate, but central underparts grey; *duidae* has whitish underparts, more pronounced bars on tail; *yavii* has whiter underparts; *fulvigularis* is darker and less rufous than nominate; *marahuacae* is similar to *wetmorei* but smaller, with very grey belly. VOICE. Song a series of high, thin whistled twitters, sometimes continuing for several seconds, sometimes in disjunct separate phrases.
Habitat. Humid forest on tepui mountains; also forest edge and bushland. At 1000–2800 m, mostly 1600–2400 m.
Food and Feeding. No published data on prey items. Spends most of its time in foraging very low in vegetation, or on ground.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Locally common; common on Mt Roraima. Much of habitat occupied by this species is very remote and largely untouched; many tepuis are also protected reserves.
Bibliography. Barnett *et al.* (2002), Chapman (1931), Cracraft (1985), Gilliard (1941), Hellmayr (1934), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Ridgely & Tudor (1989), Sick (1993, 1997), Willard *et al.* (1991).

Genus *THRYORCHILUS* Oberholser 1904

72. **Timberline Wren**

Thryorchilus browni

French: Troglodyte des volcans **German**: Bergzaunkönig **Spanish**: Cucarachero del Bambú
Other common names: Irazu Wren

Taxonomy. *Troglodytes browni* Bangs, 1902, Volcán de Chiriquí, 10,000 feet [c. 3050 m], Chiriquí, Panama.
Resembles *Henicorhina* in many aspects (song, plumage, nest), but recent DNA work suggests that it is closer to *Troglodytes*; currently placed by most authors in its own genus, pending further investigation. Validity of races disputed, and species may be better considered monotypic. Three subspecies tentatively recognized.
Subspecies and Distribution.
T. b. ridgwayi Bangs, 1906 – highlands of C Costa Rica (Volcán Turrialba, Volcán Irazú and adjacent areas).
T. b. basultoi Ridgway, 1908 – Cordillera de Dota, in SC Costa Rica.
T. b. browni (Bangs, 1902) – W Panama (Volcán Barú, Volcán de Chiriquí, Cerro Copete).
Descriptive notes. 10 cm; mean 14 g. Nominate race has lores and supercilium conspicuously grey-white, wide postocular stripe rich chocolate-brown, cheeks to area behind ear-coverts grey-white with narrow black edgings; crown and upperparts rich chestnut-brown, some feathers in middle of upper back with concealed white centres; outer primaries edged white, remainder and secondaries barred dark brown and rufous-brown; rectrices rufous-brown with narrow dark bars;



throat and chest grey-white, belly mottled grey-white, lower belly dull brown, flanks and vent rufous-brown; eye brown; bill dull black above, flesh-horn below; legs dull pale brown. Sexes similar. Juvenile is more grey below than adult, with chest and belly feathers narrowly edged grey-black, giving scalloped appearance, and facial markings less clearly defined. Race *ridgwayi* is larger than nominate, deeper rufous-brown above; *basultoi* has broader supercilium, more extensive white markings on upperparts and sides of neck, and dusky crown, and is whiter below than others, with stouter bill. Voice. Song a series of half a dozen scratchy, warbling notes, lasting 2–3 seconds, the sequence usually rapidly repeated numerous times; quite unlike that of any *Troglodytes* species. Call a harsh scolding "churr".

Habitat. Upper edge of tree zone in *páramo* and near-*páramo*; found especially in bamboo thickets, also in isolated patches of bushes in sheltered areas. Mostly 2800–3600 m, locally down to 2200 m.

Food and Feeding. Recorded food items include spiders (Araneae), caterpillars and small insects. Feeds on or near ground, sometimes fluttering to pick prey from undersides of leaves; creeps along moss-covered branches.

Breeding. Poorly documented. Season Apr–Jun in Costa Rica. Nest is a hollow ball with a side entrance, made of bamboo leaves and lined with finer fibres, situated 1–3 m up in bamboo or shrub. Eggs 2, white, speckled all over with pale brown; no information available on incubation and fledging periods.

Movements. Sedentary; not known if altitudinal movements occur.

Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Common or abundant in suitable habitat. Most of its range lies in areas under little human pressure, and large parts are included in national parks, such as that of La Amistad, and other protected areas.

Bibliography. Angehr (2003), Anon. (1998b), Blake (1958), Hellmayr (1934), Rice *et al.* (1999), Ridgely & Gwynne (1989), Ridgway (1904), Slud (1964), Stiles & Skutch (1989).

Genus *UROPSILA* P. L. Sclater & Salvin, 1873

73. **White-bellied Wren**

Uropsila leucogastra

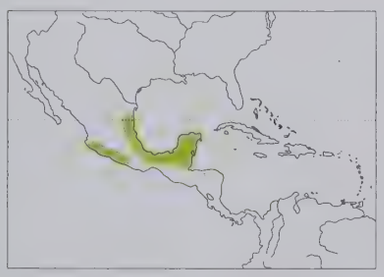
French: Troglodyte à ventre blanc **Spanish**: Cucarachero Ventriblanco
German: Weißbauch-Zaunkönig
Other common names: Gould's Wren

Taxonomy. *Troglodytes leucogastra* Gould, 1837, Tamaulipas, Mexico.

Different authorities have suggested that this species should be placed variously in *Troglodytes*, *Henicorhina* or *Thryothorus*; in absence of convicing argument, however, it is currently retained in its own monotypic genus. Population from S Quintana Roo to C Belize and N Honduras may be separable as race *australis*, with *hawkinsi* (Coyoles, Honduras) a synonym. Proposed race *grisescens* (E Mexico) apparently based on soot-discoloured specimens, and thus doubtfully valid. Six subspecies currently recognized.

Subspecies and Distribution.

U. l. pacifica (Nelson, 1897) – W Mexico (Colima, Michoacán, Guerrero).
U. l. leucogastra (Gould, 1837) – lowlands of E Mexico (S Tamaulipas and E San Luis Potosí S to N Oaxaca).
U. l. centralis A. R. Phillips, 1986 – S Mexico from N Puebla E to C Veracruz.
U. l. musica (Nelson, 1903) – S Mexico (NE Oaxaca, Tabasco, N Chiapas).
U. l. restricta A. R. Phillips, 1986 – SE Mexico (N Yucatán).
U. l. brachyura (Lawrence, 1887) – C & S Yucatán Peninsula (S to Guatemala and Belize) and N Honduras.



Descriptive notes. 9·5–10 cm; male 9·8–10·5 g, female 8–9·1 g. Nominate race has lores buffy grey, postocular supercilium grey-white, area behind eye mid-brown, ear-coverts mottled brown on grey; crown and upperparts medium brown, becoming slightly rufescent on rump; primaries and secondaries medium brown with obscure darker bars on outer webs; rectrices medium brown with many fine dark bars; throat, chest and upper belly grey, flanks, thighs and vent buff; eye brown; bill blackish-grey, paler at base; legs dull brown. Sexes similar. Juvenile has supercilium less well defined than adult, markings on ear-coverts more diffuse. Race *centralis* is paler than nominate; *pacifica* is paler above than nominate, with longer wings, shorter tarsi; *musica* is darker than nominate, upperparts deep russet-brown, flanks almond-brown; *restricta* is paler, greyer and generally duller than all others; *brachyura* has better-defined tailbars than nominate, undertail-coverts barred dusky. Voice. Song, often by both sexes in duet, a short series of 6 rapid up-and-down notes, descending at end, the whole with gurgling liquid quality; that of disjunct W race *pacifica* apparently lacks bubbly quality of other races. Calls include low "chek", scolding chatter, and hard dry cracking rattle.

Habitat. Woodland of various types, including semi-arid forest in W Mexico and much more humid rainforest in Yucatán; frequently in thickets of wild pineapple (*Bromelia pinguin*) in NE Mexico. Sea-level to 500 m.

Food and Feeding. Food items include insects and spiders (Araneae); has been seen to pilfer prey from spiderwebs. Forages in vegetation, from ground level to a considerable height; in *Bromelia* thickets takes prey from bases of leaf rosettes. In S part of range, where army ants occur, can be found in mixed bird flocks following swarms.

Breeding. Season appears to be late Mar to Jun; at present not known if species is multiple-brooded. Nest a peculiar structure shaped like old-fashioned chemical retort, with oval ball c. 12·5 × 20 cm containing egg-chamber, downward-pointing funnel c. 5 cm in length as entrance, beautifully woven from fine grasses, decorated on outside with lichens, spider egg cases, moss and similar material; more flimsy nests also built, probably for roosting; placed 3–4 m above ground, occasionally 1·5 m or as high as 15 m, usually in protective site in spiny *Bromelia* thicket, or in acacia (*Acacia*) protected by vicious symbiotic ants of genus *Pseudomyrmex* (55 of 59 nests in a study in Guatemala). Eggs usually 4, glossy, pale unmarked blue; incubation apparently carried out by both sexes (unusual for a wren), young fed by both parents; no information available on incubation and fledging periods.

Movements. Apparently sedentary.

Status and Conservation. Not globally threatened. Reasonably common over much of its range. Able to tolerate moderate habitat disturbance. Occurs in several protected areas, including e.g. Maya Biosphere Reserve in Guatemala and contiguous parts of Mexico and Belize.

Bibliography. Anon. (1998b), Binford (1989), Blake (1953), England (2000), Gilardi & von Kugelgen (1991), González-García (1993), Gordon & Ornelas (2000), Hellmayr (1934), Howell & Webb (1995), Hutto (1980, 1992, 1994), Land (1970), Lee Jones (2004), Monroe (1963), Ornelas *et al.* (1993), Paynter (1955), Peterson, Navarro *et al.* (2003), Russell (1964), Sutton (1948), Waide (1980), Waide & Hailman (1977), Wauer (1998).

Genus *HENICORHINA* P. L. Sclater & Salvin, 1868

74. **Grey-breasted Wood-wren**

Henicorhina leucophrys

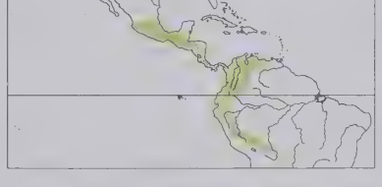
French: Troglodyte à poitrine grise **Spanish**: Cucarachero Pechigrís
German: Einsiedlerzaunkönig
Other common names: Highland Wood-wren

Taxonomy. *Troglodytes leucophrys* Tschudi, 1844, Montaña del Vitoc, Junín, Peru.

Has been thought to form a superspecies with *H. leucosticta*, but geographical and altitudinal overlap too extensive to justify such treatment. Possibly involves more than one species; *bangsi* and *anachoreta* are separated altitudinally in Santa Marta massif (N Colombia), and *brunneiceps* appears to have different song type from neighbouring races. Race *composita* perhaps not distinguishable from *castanea*. Eighteen subspecies recognized.

Subspecies and Distribution.

H. l. mexicana Nelson, 1897 – E Mexico (SE San Luis Potosí S to N Oaxaca).
H. l. minuscula A. R. Phillips, 1966 – W Mexico (SW Jalisco and Michoacán E to W México).
H. l. festiva Nelson, 1903 – SW Mexico from Michoacán S to Guerrero.
H. l. capitalis Nelson, 1897 – S Mexico (Veracruz and Puebla S to Oaxaca) and W Guatemala.
H. l. castanea Ridgway, 1903 – Atlantic slope of Guatemala.
H. l. composita Griscom, 1932 – N El Salvador, SC highlands of Honduras and adjacent NW Nicaragua.
H. l. collina Bangs, 1902 – C Costa Rica S to E Panama.
H. l. bangsi Ridgway, 1903 – Santa Marta Mts (below 2000 m), in N Colombia.
H. l. anachoreta Bangs, 1899 – upper levels of Santa Marta (2000–4000 m).
H. l. manastarae Aveledo & Ginés, 1952 – Perijá Mts, on N Colombia–Venezuela border.
H. l. sanluisensis Phelps, Sr & Phelps, Jr, 1959 – Sierra de San Luis, in C Falcón (NW Venezuela).
H. l. venezuelensis Hellmayr, 1903 – N Andes and coastal mountains of Venezuela (Lara, Yaracuy, and Carabobo E to Miranda).
H. l. meridana Todd, 1932 – Venezuelan Andes (Trujillo S to N Táchira).
H. l. tamae J. T. Zimmer & Phelps, Sr, 1944 – E Andes of SW Venezuela (SW Táchira) and E slope in Colombia.
H. l. brunneiceps Chapman, 1914 – W Colombia and NW Ecuador.
H. l. leucophrys (Tschudi, 1844) – subtropical zone in Colombia (E slope of W Andes E to W slope of E cordillera), Ecuador (except NW & SW) and Peru.
H. l. hilaris Berlepsch & Taczanowski, 1884 – subtropical zone of SW Ecuador.
H. l. boliviana Todd, 1932 – W Bolivia (La Paz, Cochabamba).



Descriptive notes. 10–11·5 cm; male average 18·1 g, female average 16·4 g. Nominate race has long grey-white supercilium, lores and wide postocular stripe black, black ear-coverts prominently streaked grey-white; crown feathers dull black with dark brown tips, nape and shoulders dark olive-brown, lower back and rump more chestnut; primaries and secondaries are barred on outer webs with dull chestnut-brown and darker brown, tertials dull red-brown with narrow darker bars; rectrices dull chestnut-brown, barred dull blackish-brown; chin and throat whitish-grey, chest and belly grey, side of belly and lower flanks brownish-buff; eye reddish-brown; bill black, dark grey base of lower mandible; legs dingy brownish-black. Sexes similar. Juvenile differs from adult in having facial markings more diffuse, throat greyish. Race *boliviana* is similar to nominate, but more streaked on throat, flanks less rufescent; *hilaris* is paler on foreneck and breast; *brunneiceps* has heavier bill than nominate, brighter upperparts, distinctly streaked throat, darker underparts; *meridana* has profusely streaked throat, slate-grey breast; *bangsi* is pale below, with pale grey-white throat and breast; *anachoreta* is similar to previous but has dusky throat streaking; *venezuelensis* is also similar, but with darker grey chest side, less rufescent flanks; *manastarae* is closest to previous, but sides, thighs and undertail-coverts a brighter brown colour; *sanluisensis* is darker and browner, less reddish, on back, and with darker, more greyish breast and abdomen; *tamae* has blackish streaks on throat; *castanea* is rather dark above and below, with diffuse throat streaking, small bill; *composita* is similar to previous, but paler cheeks; *collina* is also similar, but paler on back; *capitalis* is closest to last, but less chestnut above, with sooty-grey crown centre, more diffuse throat markings; *mexicana* is similar to previous, but with deeper and more rufescent flanks; *minuscula* is paler above, with duller crown; *festiva* is duller below, with crown and nape greyish-brown. Voice. Song, given both antiphonally and solo, a series of very loud, ringing musical phrases, frequently repeated, longer and more

complex than *H. leucosticta* song; individual pairs often develop distinctive unique motifs, also considerable geographical variation in song type, e.g. much more tinkling in W Colombia (race *brunneiceps*). Calls also vary, in Mexico a sharp 'tek-tek-tek", in Costa Rica softer; alarm calls include harsh churrs and scolding notes.
Habitat. Inhabits humid mountain forest; found in a wide variety of forest types, including pine–oak (*Quercus–Pinus*) complexes, bamboo thickets and fringes of *páramo*. Usually above 1500 m; up to 4000 m in Colombia, but on Pacific slope down to 400 m; occasionally down to 600 m in Mexico.
Food and Feeding. Food seems to be entirely invertebrates; no evidence of vegetable matter being eaten. Forages singly, or in small parties (probably family groups), on ground or in lower levels of vegetation.
Breeding. Late Mar to early Jun in Costa Rica and Dec–Jun in Colombian Andes; possibly multi-brooded. Nest built by both sexes, a globular structure consisting of rounded chamber, roof of which projects forwards and downwards, giving downward-pointing antechamber at front (necessitating almost vertical mode of entry), made of fibrous rootlets, with moss attached to roof and walls, situated in low vegetation, frequently over bank or ravine; dormitory nests also built, these identical to breeding nests (in contrast to those of *H. leucosticta*). Eggs 2, pure white without markings; incubation by female alone, period 19–20 days; chicks fed by both sexes, fledging period 17–18 days.
Movements. Largely sedentary. Some evidence of altitudinal movements in response to rainfall in Guatemala.
Status and Conservation. Not globally threatened. Common or abundant in many habitats. Although significant habitat loss has occurred in many parts of its range, it is not at risk in any country. Occurs in several protected areas, e.g. Tapantí National Park, in Costa Rica, Henri Pittier National Park, in Venezuela, and Cock-of-the-Rock Lodge, in Peru.
Bibliography. Allen (1998), Anon. (1998b), Aveledo & Ginés (1952), Binford (1989), Blake (1953), Blake & Hanson (1942), Bloch *et al.* (1991), Chapman (1917), Clements & Shany (2001), Cracraft (1985), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Hellmayr (1934), Hennessey *et al.* (2003), Hilty (1997, 2003), Hilty & Brown (1986), Howell & Webb (1995), Miller (1963), Monroe (1968), Orejuela *et al.* (1980), Parker *et al.* (1985), Phelps & Phelps (1959), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Ridgway (1904), Rowley (1966), Salaman (1994), Skutch (1940, 1960), Slud (1964), Sousa *et al.* (1982), Stiles & Skutch (1989), Walker (2001), Williams & Tobias (1994), Winnett-Murray (1987), Yanega (1996), Zimmer (1930).

75. Munchique Wood-wren

Henicorhina negreti

French: Troglodyte de Negret **German**: Negretzaunkönig **Spanish**: Cucarachero de Munchique

Taxonomy. *Henicorhina negreti* Salaman *et al.*, 2003. Tambito Natural Reserve, El Tambo, Cauca, Colombia.
Closely related to, and probably derived from, *H. leucophrys*. Monotypic.
Distribution. W Andes of Colombia: where departments of Chocó, Antioquia and Risaralda meet; and in Munchique massif (Valle de Cauca).



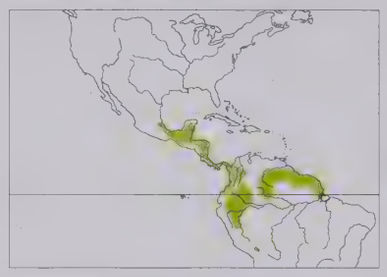
Descriptive notes. 10·8–11·7 cm; 15·2–16·7 g. Has narrow white supercilium, dull black lores, postocular area and auriculars, blackish cheeks and malar area mottled dull white to greyish-white; crown very dark brown, suffused with blackish, upperparts slightly brighter brown; outer webs of primaries and secondaries brown with narrow black bars, rectrices brown with irregular black bars; throat white, heavy black streaking posteriorly; breast medium grey, belly paler grey, flanks and crissum brown, abdomen and middle area of flanks with irregular dark grey to blackish bars; eye hazel-brown; bill black, basal half of lower mandible lead-grey; legs bluish slate-grey. Distinguished from *H. leucophrys* by, especially, its barred abdomen. Sexes similar. Juvenile is much darker overall than adult, with greyish-white supercilium, dark sooty-grey cheeks and malar region with only faint paler mottling, throat dark grey with dusky fringes, breast solid dark sooty-grey, flanks and abdomen unbarred dark dull brown. Voice. Repeated phrases of 6–12 pure notes, each phrase lasting c. 2 seconds, typical song containing more than ten repeated phrases, but often curtailed; very different from song of *H. leucophrys*. Call notes mostly churrs, similar to those of congeners.
Habitat. Apparently very specific in requirements, in contrast to more catholic *H. leucophrys*. Found in very wet, stunted epiphytic cloudforest characterized by almost continuous fog cover, at 2250–2640 m. Sharply separated ecologically from the two neighbouring races of *H. leucophrys*, one of which (nominate) occurs on drier E slopes of Munchique massif and the other (*brunneiceps*) on wetter Pacific slope but at lower altitudes (where fog cover much less prevalent, and vegetation generally taller) than present species. In some areas all three taxa occur within distance of 1 km, and breeding *brunneiceps* may be found only 200 m from present species, but no two of the three are found together.
Food and Feeding. Stomach contents exclusively arthropods, especially beetles (Coleoptera) and flies (Diptera). Forages close to forest floor, usually below 2 m; occasionally as high as 4 m to investigate epiphyte clusters. May associate with mixed flocks, but only briefly, when these pass through its territory.
Breeding. Juvenile on 25th Jul estimated to have fledged c. 2 weeks previously, implying egg date of about first week of Jun. No other information.
Movements. Presumably totally sedentary.
Status and Conservation. Not globally threatened. Conservation status not yet properly assessed, as species only recently discovered. When originally discovered, recommended status was Critical, on basis of total range of less than 100 km² and estimated population of fewer than 2500 individuals. However, very recently a second population was discovered c. 350 km to N, and there species appears to be common; extensive areas of apparently suitable habitat remain between these two nuclei, and these areas need surveying. Although southern portion of the species' range is nominally protected, lying within Munchique National Park and Tambito Nature Reserve, in practice forest clearance for agriculture continues in the absence of adequate wardening and enforcement of regulations. Very narrow and specific ecological requirements of this wren would render it vulnerable to climatic change. The Munchique area, which contains several species of very limited range, clearly merits classification as an Important Bird Area.
Bibliography. Anon. (2004a, 2004b), Ebels (2004), Kirwan (2004), Salaman *et al.* (2003), Suárez *et al.* (2005).

76. White-breasted Wood-wren

Henicorhina leucosticta

French: Troglodyte à poitrine blanche **Spanish**: Cucarachero Pechiblanco
German: Waldzaunkönig
Other common names: Lowland Wood-wren

Taxonomy. *Cyphorhinus leucosticta* Cabanis, 1847, Guyana.
Has been thought to form a superspecies with *H. leucophrys*, but geographical and altitudinal overlap too extensive to justify such treatment. Possibly represents three distinct species, with separation of *prostheleuca* and *pittieri* groups. Race *prostheleuca* intergrades with *smithei* in SE Mexico (extreme S Quintana Roo) and N Belize. Thirteen subspecies recognized.
Subspecies and Distribution.
H. l. decolorata A. R. Phillips, 1986 – E Mexico (San Luis Potosí S to N Veracruz and N Puebla).
H. l. prostheleuca (P. L. Sclater, 1857) – S & E Mexico (from Veracruz and N Chiapas) E to Belize.
H. l. smithei Dickerman, 1973 – S part of Yucatán Peninsula S to Guatemala.
H. l. tropaea Bangs & J. L. Peters, 1927 – Honduras and Nicaragua.
H. l. costaricensis Dickerman, 1973 – N & E Costa Rica.
H. l. pittieri Cherrie, 1893 – SW Costa Rica and W Panama.
H. l. alexandri A. R. Phillips, 1986 – E Panama and immediately adjacent NW Colombia.
H. l. darienensis Hellmayr, 1921 – E Panama (Darién) and W Colombia (S to Baudo Mts).
H. l. inornata Hellmayr, 1903 – W Colombia (S of R San Juan) S to extreme NW Ecuador.
H. l. albilateralis Chapman, 1917 – W Colombia (lower Cauca Valley, middle Magdalena Valley).
H. l. eucharis Bangs, 1910 – W Colombia (Valle).
H. l. leucosticta (Cabanis, 1847) – E & S Venezuela, Guyana, Suriname, French Guiana (one record), and N Brazil (S to N Pará).
H. l. hauxwelli Chubb, 1920 – tropical zone of upper Amazonia in S Colombia (S from Meta and Vaupés), E Ecuador and NE Peru.



Descriptive notes. 10–11·5 cm; mean 15·7 g. Nominate race has lores blackish-grey, supercilium greyish in front of eye, white behind; blackish area behind eye bordered with white spots at neck, black ear-coverts conspicuously spotted and streaked grey-white; crown and nape black, nape feathers tipped deep brown, back deep rich brown, rump rufescent brown; primaries and secondaries warm brown on outer webs, indistinctly barred darker brown; rectrices deep reddish-brown, narrowly barred blackish; chin, throat and chest white, chest side grey, belly and flanks warm ochraceous brown; eye brown; bill black, horn-coloured base of lower mandible; legs dark grey. Sexes similar. Juvenile has brown crown little different in colour from back, greyish (not white) throat and chest, grey belly, sometimes obscure darker bars below. Race *hauxwelli* is similar to nominate, but deeper rufous-chestnut on back, wings and tail, darker rufous-brown on flanks; *prostheleuca* has reddish-brown cap, not very rufescent above; *decolorata* is similar to previous but smaller, generally duller, paler and less rufescent, especially on wings and tail; *tropaea* is also similar, but is more rufescent on back and flanks, and has reddish-brown central crownstripe; *darienensis* is similar to last, but with black crown; *pittieri* is also similar, but brighter chestnut above, flanks more russet, median crownstripe rufescent; *smithei* is paler dorsally than other Central American races, greyer than previous, greyish-brown on crown; *costaricensis* is darker and less rufescent above than other Central American races, back dark chocolate-brown; *alexandri* is relatively pale and bright above, flanks with little reddish-brown tinge; *eucharis* is larger, rather dull above, with less black on cheeks, barring on primaries and secondaries more obscure; *albilateralis* differs from previous in having duller plumage, back cinnamon-brown, flanks with less grey; *inornata* is brighter above, with rufous crown, narrower white supercilium, deeper rufous-brown flanks, thicker bill. Voice. Song loud and powerful, consists of 3–5 clear whistles, constantly repeated as a phrase, often mixed with trills; both sexes sing, often antiphonally, female may sing while incubating. Call notes appear to vary geographically; in Veracruz (Mexico) a bright metallic "tick", in Costa Rica a hoarse "eerp".
Habitat. Inhabits wet lowland forest, from sea-level up to 1300 m; more rarely, up to 1800 m or even 2000 m.
Food and Feeding. Food mostly or entirely invertebrates; nestling diet entirely animal, especially grubs and larvae. Forages from ground level up to 2–3 m, rarely higher; especially fond of tangles surrounding fallen trees and ravines. Sometimes briefly joins mixed flocks of birds around ant armies, but not a true swarm-follower.
Breeding. Season Feb–May, rarely Jan, in Costa Rica and Feb–Jul in Suriname; newly fledged young in Dec in French Guiana, and birds in breeding condition Jan–Jul in Colombia. Nest ovoid in shape, rather taller than wide, with thick bottom, circular entrance hole at side protected above by visor-like projection, made of fibrous vegetable material, rootlets and similar material, camouflaged externally with moss, interior lined with feathers, placed on or close to ground and well concealed in thick vegetation or in tree stump; separate nests built for roosting much more flimsy than breeding nest, usually sited higher up and with less regard for concealment, placed in more slender vegetation which cannot be climbed by predator without shaking nest and alerting occupant. Eggs 2, usually immaculate glossy white, more rarely with few brown speckles; incubation probably by female alone, period c. 18 days; chicks fed by both sexes, fledging period probably 17–18 days.
Movements. Apparently entirely sedentary.
Status and Conservation. Not globally threatened. Considered common or abundant over much of its range. Although much of its habitat has been lost to agricultural and other development, this species is not at any risk in any of the countries in which it occurs. Present in several protected areas, including e.g. Braulio Carrillo National Park, in Costa Rica, and Darién National Park, in Panama.
Bibliography. Anon. (1998b), Blake (1953), Brenowitz & Kroodsma (1996), Brodkorb (1943), Canaday & Jost (1997), Carriker (1910), Chapman (1917), Clements & Shany (2001), Dickerman (1973), Haffer (1975), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995), Land (1970), Lee Jones (2004), Monroe (1968), Novaes (1974), Orejuela *et al.* (1980), Paynter (1957), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Ridgway (1904), Robbins *et al.* (1985), Salaman (1994), Skutch (1940, 1960, 1979), Slud (1964), Smithe (1966), Stiles & Skutch (1989), Tostain *et al.* (1992), Winker *et al.* (1996), Zimmer (1930).

77. **Bar-winged Wood-wren**

Henicorhina leucoptera

French: Troglodyte à ailes blanches **Spanish**: Cucarachero Aliblanco
German: Bindenflügel-Zaunkönig

Taxonomy. *Henicorhina leucoptera* Fitzpatrick *et al.*, 1977, Cajamarca, Peru.
Possibly more closely related to *H. leucophrys*; somewhat intermediate between that species and *H. leucosticta*. Monotypic.
Distribution. Recorded S Ecuador (Cordillera del Cóndor) and N Peru (Cajamarca, San Martín and La Libertad). Imperfectly known.
Descriptive notes. 11 cm; 14·5–16·5 g. Has white lores and supercilium, broken white eyering, wide black postocular stripe, side of face boldly streaked with black and white; crown grey at front, light brown at rear, back dark reddish-brown, becoming reddish laterally and amber on rump; primaries black, barred burnt umber, outermost fringed with white; rectrices blackish, finely barred fuscous on outer webs; chin, throat and upper breast off-white, darker laterally, lower breast white to grey, lower belly cinnamon, crissum cinnamon-brown; eye dark reddish-brown; bill mostly black; legs dark grey. Sexes similar. One juvenile known, face pattern more diffuse, lores grey, some brown on belly. Voice. Two song types, the first a series of loud ringing phrases, like song of *H. leucophrys* but faster, higher and with more ringing quality, the second consisting of longer phrases, beginning and ending with a trill; each sex sings an individual motif in syncopation with its partner. Call a rapid, high-pitched chatter.



Habitat. Originally discovered in impoverished forest types based on a quartz sand soil, with "sparse canopy of stunted trees"; more recently has been found in more varied habitat, from tall moist hill forest to fern-covered slopes in savanna woodland.
Food and Feeding. Stomach contents seem to consist entirely of invertebrates. Has finer bill and heavier legs than *H. leucophrys* and may differ in foraging habits, possibly specializing in vertical perches or in foraging near the ground.
Breeding. Juvenile in mid-Jul. No other information.
Movements. Probably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Andean Ridge-top Forests EBA and North-east Peruvian Cordilleras EBA. Has been described as common or abundant in some places. Distribution imperfectly known. Locations where it has been observed appear not to be currently under any pressure, being areas of poor soil and with little marketable timber.
Bibliography. Barnett & Kirwan (1999), Clements & Shany (2001), Davies *et al.* (1994, 1997), Davis (1986), Fitzpatrick *et al.* (1977), Fjeldså & Krabbe (1990), Hornbuckle (1999a), Krabbe & Sornoza (1994), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Stattersfield & Capper (2000).


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ssp infuscatus
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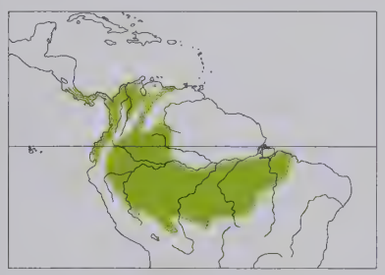
Genus *MICROCERCULUS* P. L. Sclater, 1862

78. Southern Nightingale-wren

Microcerculus marginatus

French: Troglodyte siffleur **Spanish**: Cucarachero Ruiseñor Sureño
German: Schuppenbrust-Zaunkönig
Other common names: Scaly-breasted Wren/Nightingale-wren, Scaling Nightingale-wren; Whistling Wren (*luscinia*)

Taxonomy. *Heterocnemis marginata* P. L. Sclater, 1855, "Bogotá", Colombia.
Sometimes treated as conspecific with *M. philomela*, but differs substantially in vocalizations. Race *luscinia* regarded by some authorities as a full species; alternatively, this and other more northerly races (*squamulatus*, *corrasus*, *occidentalis*, *taeniatus*) together possibly form a separate species. In addition, recent DNA studies suggest that populations of nominate race N of Amazon may represent a different species from those S of the river, despite absence of obvious morphological differences. Race *occidentalis* sometimes merged with *taeniatus*. Six subspecies currently recognized.
Subspecies and Distribution.
M. m. luscinia Salvin, 1866 – C Costa Rica S to Panama (S to E Darién).
M. m. squamulatus P. L. Sclater & Salvin, 1875 – N Colombia (except Santa Marta) and mountains of NW & N Venezuela (E in coastal range to Distrito Federal).
M. m. corrasus Bangs, 1902 – Santa Marta region of N Colombia.
M. m. occidentalis Hellmayr, 1906 – W Colombia and NW Ecuador.
M. m. taeniatus Salvin, 1881 – tropical zone of W Ecuador.
M. m. marginatus (P. L. Sclater, 1855) – W Amazonia, from E Ecuador, E Colombia and S Venezuela (SW Amazonas) S to E Peru, W & C Brazil (E, S of Amazon, to Maranhão) and N & NE Bolivia.



Descriptive notes. 11 cm; male 18·2–22 g, female 17–18 g. Nominate race has face dull grey-brown, crown and upperparts deep chocolate-brown, with rump slightly more rufescent; primaries, secondaries and tertials dark chocolate-brown, tertials with obscure darker barring; rectrices extremely short, dark chocolate-brown; chin to upper belly white, feathers on side of chest scalloped with blackish, lower flanks, belly and thighs deep chocolate-brown; eye dark brown; bill black, creamy base of lower mandible; legs greyish-black. Sexes similar. Juvenile has obscure darker barring on crown and back, dark brown feather tips below, flank barring more pronounced. Race *squamulatus* is similar to nominate, but with scaly markings on underparts; *taeniatus* is similar to previous, but deeper rufous-brown above, blackish barring below wider and better defined; *corrasus* is also similar, but purer white with narrower dark bars below, finer bill; *occidentalis* differs from nominate in having longer and thinner bill, darker upperparts and flanks, broad dark bars on abdomen; *luscinia* has throat whitish to pale grey becoming brownish-grey on breast and upper belly, with deep brown flanks and lower belly. Voice. Songs differ geographically. In Central America starts with series of c. 10–15 short notes that slow, lengthen, become louder and rise in pitch, followed by 2 loud upslurred notes, and then a series of pure, long-drawn-out high-pitched whistles, becoming longer and ending in a series of double whistles, entire sequence lasting up to 2·5 minutes; this song type occurs also from Panama S to W Amazonia, with minor differences in E Amazonia. Song in E Peru and N Bolivia consists of clear, pure notes given at random, with changes in pitch, length and volume. Call (in Costa Rica) a chatter like that of an antbird (Thamnophilidae), and loud "stchep".
Habitat. Inhabits lower levels of dense, humid tropical forest. Recorded from sea-level up to 1700 m in Costa Rica, up to 1400 m in Colombia and up to 1800 m in Venezuela; one record at 3100 m in Panama (Chiriquí).
Food and Feeding. Few published data available on food items consumed; a nesting pair in Panama was seen to carry spiders (Araneae) and orthopterans to its nestlings. Generally solitary. Forages low down in vegetation and on ground, walking in manner of an antpitta (Formicariidae); is occasionally found associated with army ants in Central America, but appears not to follow swarms routinely.
Breeding. Season seems to be quite protracted; adults observed feeding fledged young in mid-Feb in Costa Rica, and nests found in late May and early Jul and female in breeding condition in Nov, all in Panama. Following details from Panama: two nests described (Chiriquí, Canal Zone), made of dead leaves, situated at end of burrows in earthen banks, probably originally excavated by Blue-crowned Motmot (*Momotus momota*) in one case and by Scaly-throated Leaftosser (*Sclerurus guatemalensis*) in the other; respective clutches of 2 and 3 eggs (eggs stated to be white, but without confirmatory detail); at one nest, incubation recorded as 16–17 days and fledging period c. 19–20 days.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Population density usually fairly low, but the species appears to be well distributed in much of its range. Occurs in a number of national parks and similar protected areas, including e.g. Henri Pittier National Park, in Venezuela, Río Palenque Science Centre, in Ecuador, Manu National Park and Biosphere Reserve, in Peru, and Rio Cristalino Forest Reserve, in Brazil.
Bibliography. Allen (1995, 1998), Anon. (1998b), Chapman (1917), Christian & Roberts (2000), Haffer (1975), Hellmayr (1934), Hennessey *et al.* (2003), Hilty (1997, 2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Orejuela *et al.* (1980), Oren & Parker (1997), Perry *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Ridgway (1904), Robbins *et al.* (1985), Robinson & Terborgh (1997), Salaman (1994), Schönwetter (1963–1974), Sick (1993, 1997), Slud (1958), Stiles (1984), Stiles & Skutch (1989), Stotz *et al.* (1997), Wetmore *et al.* (1984), Zimmer *et al.* (1997).

79. Northern Nightingale-wren

Microcerculus philomela

French: Troglodyte philomèle **Spanish**: Cucarachero Ruiseñor Norteño
German: Nachtigallzaunkönig
Other common names: Dark-throated Nightingale-wren

Taxonomy. *Cyphorhinus philomela* Salvin, 1861, Alta Vera Paz, Guatemala.
Sometimes treated as conspecific with *M. marginatus*, but differs markedly in vocalizations. Monotypic.
Distribution. Lowlands of S Mexico (N Chiapas), NC Guatemala, S Belize, and Caribbean lowlands of Honduras, Nicaragua and N Costa Rica (S to R Reventazón).



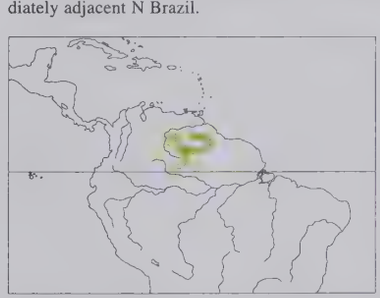
Descriptive notes. 10–11·5 cm; male 17·4–21·5 g, female 16·4–17·4 g. Lores and side of face are dull greyish-brown; crown and upperparts deep chocolate-brown, each feather tipped blackish, giving obscure scaled appearance; primaries, secondaries and extremely short tail dull brownish-black; throat dark grey with blackish-brown mottling; chest and belly dull blackish-brown, speckled paler grey, lower belly and flanks more rufescent, flanks with obscure darker barring; eye dark brown; bill and legs black. Sexes similar. Juvenile is darker and less rufescent than adult, crown and back with obscure black edgings, underparts darker and more dusky with little grey, feather edgings producing scaly appearance. Voice. Song unmistakable and "haunting", a series, up to 30 seconds long, of clearly whistled notes, c. 2 per second, pitch of each note changing either up or down unpredictably (impression of "a slightly tone-deaf person whistling a hymn-tune"), the sequence usually preceded by a softer ascending series of more rapid notes. Call a harsh "thuk"; juvenile begging call a soft, sad "peew".
Habitat. Humid lowland forest, especially undisturbed virgin evergreen forest and contiguous cloudforest; sea-level to 1200 m, sometimes to 1800 m.
Food and Feeding. Little information; in Costa Rica, insects, woodlice (Isopoda), spiders (Araneae) and centipedes (Chilopoda) recorded as food. Typically, feeds on or very near the ground, or on fallen logs, walking with teetering motion.
Breeding. Season from May or Jun until at least Sept in Costa Rica. No other information available.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Uncommon to fairly common in Mexico, uncommon in Guatemala, apparently rare in Belize, uncommon to fairly common in Honduras, and locally common in Costa Rica. Not tolerant of modification of its habitat, and is therefore vulnerable to forest disturbance; large areas of its range have been extensively deforested, a process which continues apace. Some parts of range protected, such as the Selva Lacandona, in Mexico, Boswas and Río Indio, in Nicaragua, and several reserves in N Costa Rica.
Bibliography. Blake (1953), Gillespie (2001), González-García (1993), Griscom (1932b), Hellmayr (1934), Howell & Webb (1995), Land (1970), Lee Jones (2004), Leger *et al.* (2000), Monroe (1968), Paynter (1957), Phillips (1986), Ridgway (1904), Slud (1960, 1964), Stiles (1983, 1984), Stiles & Skutch (1989), Wiley (2000).

80. Flutist Wren

Microcerculus ustulatus

French: Troglodyte flûtiste **German**: Flötenzaunkönig **Spanish**: Cucarachero Flautista

Taxonomy. *Microcerculus ustulatus* Salvin and Godman, 1883, Cerro Roraima, Bolívar, Venezuela.
Four subspecies recognized.
Subspecies and Distribution.
M. u. duidae Chapman, 1929 – cerros of W Bolívar and Amazonas, in S Venezuela.
M. u. lunatipectus J. T. Zimmer & Phelps, Sr, 1946 – cerros of C Bolívar.
M. u. obscurus J. T. Zimmer & Phelps, Sr, 1946 – cerros of E Bolívar (S to Gran Sabana).
M. u. ustulatus Salvin & Godman, 1883 – subtropical zone of W Guyana, SE Venezuela and immediately adjacent N Brazil.



Descriptive notes. 11·5 cm; 22 g. Nominate race has crown medium chocolate-brown, with faint scalloping; upperparts medium chocolate-brown, slightly rufescent on lower back and rump; primaries and secondaries dull blackish-brown, very short tail chocolate-brown; chin pale brown with obscure darker feather edgings; chest more rufescent with more prominent edgings, thighs, lower belly and vent dark chocolate-brown; eye brown; bill black, creamy base of lower mandible; legs black. Sexes similar. Juvenile has obscure dark barring below. Race *obscurus* is darker above and more rufous below than nominate; *lunatipectus* has heavier and more extensive scaling below than other races, extending forwards onto throat; *duidae* is generally paler than nominate, with lighter, less rufous, upperparts, less umber underparts. Voice. Song a superb glissando which, after a couple of introductory notes, gradually and slowly slides up the scale, entire sequence continuing for 10–20 or more seconds; variant song is similar, but with notes more clipped and gradually dropping in pitch.
Habitat. Inhabits dense wet montane subtropical forest, including flat summits of some tepuis, at 860–2100 m.
Food and Feeding. Arthropods; no details. Generally solitary. Picks, gleans and probes for food items on forest floor, occasionally a little above it.
Breeding. No information.

On following pages: 81. Wing-banded Wren (*Microcerculus bambla*); 82. Chestnut-breasted Wren (*Cyphorhinus thoracicus*); 83. Song Wren (*Cyphorhinus phaeocephalus*); 84. Musician Wren (*Cyphorhinus arada*); 85. Donacobius (*Donacobius atricapilla*).

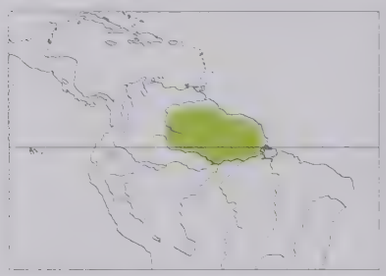
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tepuis EBA. Quite common in some areas. Much of the species' range is almost uninhabited by humans and of very difficult access. Species occurs in various protected areas, such as Canaima National Park (SE Bolívar).
Bibliography. Barnett *et al.* (2002), Blake & Loiselle (1991), Chapman (1931), Cracraft (1985), Hellmayr (1934), Hilty (2003), Mayr & Phelps (1967), Meyer de Schauensee (1982), Meyer de Schauensee & Phelps (1978), Ridgely & Tudor (1989), Sick (1993, 1997), Snyder (1966), Wheatley (1994), Willard *et al.* (1991).

81. **Wing-banded Wren**

Microcerculus bambla

French: Troglodyte bambla **Spanish**: Cucarachero Alifranjeado
German: Weißbinden-Zaunkönig

Taxonomy. *Formicarius bambla* Boddaert, 1783, Cayenne.
Three subspecies recognized.
Subspecies and Distribution.
M. b. bambla (Boddaert, 1783) – extreme E Venezuela (E Bolívar), the Guianas and N Brazil (Roraima E to Amapá).
M. b. caurensis Berlepsch & Hartert, 1902 – S & SE Venezuela (S Bolívar, Amazonas) and extreme E Colombia.
M. b. albigularis (P. L. Sclater, 1858) – E Ecuador (Sucumbíos, Napo, Pastaza), E Peru and NW Brazil (NAmazonas).



Descriptive notes. 11·5 cm; c. 17–19 g. Nominate race has lores and ear-coverts dark brown; crown and upperparts blackish-brown, each feather obscurely tipped darker brown; primaries, secondaries and upperwing-coverts dark chocolate-brown, greater coverts with conspicuous broad white tips (forming complete white bar across closed wing), lesser coverts narrowly tipped whitish; tail very short, rectrices blackish-brown, obscurely barred darker brown; chin dull greyish, throat darker grey, chest grey-brown with obscure darker feather tips, belly and flanks browner than chest, faintly barred; eye brown; bill black above, below yellowish to fleshy pink with dusky-brown tip; legs brownish-grey. Sexes similar. Juvenile lacks conspicuous wingbar, and has underparts more scaly. Race *caurensis* is brighter rufous above than nominate, lacks dusky markings on back, breast and flanks; *albigularis* is similar to previous, but paler throat. Voice. Song is a beautiful series of 3–6 clear, pure high-pitched notes separated by short pauses; sometimes ends after this prologue, or continues in series of accelerating notes which merge into long, sustained glissando of shorter and lower notes. Call is a sharp metallic "click".
Habitat. Lowland rainforest, including forest with dense understorey and somewhat more open types; essential requirement appears to be a wet understorey rich in rotting logs. From sea-level up to 1100 m, in Venezuela sometimes to 1500 m; usually at rather lower levels than those occupied by *M. ustulatus*.
Food and Feeding. Adults in French Guiana seen to carry moths (Lepidoptera), worms, orthopterans, spiders (Araneae) and tiny frogs to nest; no other data on prey items. Feeds on ground or very low down; seems to specialize in exploring rotten logs and the detritus from rotting trees, often disappearing into cavities for a few seconds; appears rarely to explore leaf litter, in contrast to other members of genus.
Breeding. Two nests described (both in Nouragues Natural Reserve), on 21st and 22nd Mar, and individual carrying food on 21st Jan, all in French Guiana. Each nest c. 2 m up in cavity in termite (Isoptera) nest on rotten buttress of fallen dead tree, cavity probably previously excavated by Yellow-billed Jacamar (*Galbula albirostris*); each held one well-grown nestling, which was fed by both of its parents. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Widely distributed but not particularly common in French Guiana; only recently discovered in Suriname, where is probably rare; apparently commoner in parts of Guyana; local and uncommon in Venezuela; locally distributed in Ecuador, and rare in Peru. Probably requires relatively undisturbed habitat. Some areas of its habitat lie within protected reserves, e.g. at Iwokrama, in Guyana, and Manu, in Peru. This species appears to be at relatively little risk at present, as large parts of its range are very sparsely populated by human beings.
Bibliography. Bangs & Penard (1918), Clements & Shany (2001), Cohn-Haft *et al.* (1997), Cracraft (1985), Dick *et al.* (1984), Friedmann (1948), Gilliard (1941), Haverschmidt & Mees (1994), Hellmayr (1934), Hilty (2003), Huguet & Tostain (1990), Jullien & Cariveau (2001), Mees (1968), Meyer de Schauensee (1982), Novaes (1974), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Servat & Pearson (1991), Snyder (1966), Stiles (1984), Terborgh *et al.* (1984), Tostain *et al.* (1992), Willard *et al.* (1991).

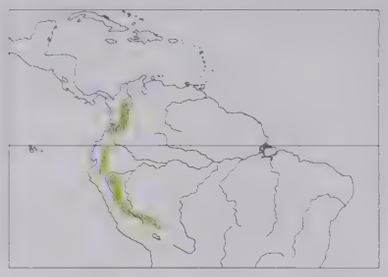
Genus *CYPHORHINUS* Cabanis, 1844

82. **Chestnut-breasted Wren**

Cyphorhinus thoracicus

French: Troglodyte ferrugineux **Spanish**: Cucarachero Pechicastaño
German: Kastanienbrust-Zaunkönig

Taxonomy. *Cyphorhinus thoracicus* Tschudi, 1844, mountains of Uchubamba, near Vitoc, Junín, Peru.
May form a superspecies with *C. phaeocephalus* and *C. arada*. Two subspecies recognized.
Subspecies and Distribution.
C. t. dichrous P. L. Sclater & Salvin, 1879 – W & C Andes of Colombia (S from Antioquia) S to N Peru (San Martín).
C. t. thoracicus Tschudi, 1844 – Peru (Huánuco S to Puno) and W Bolivia.



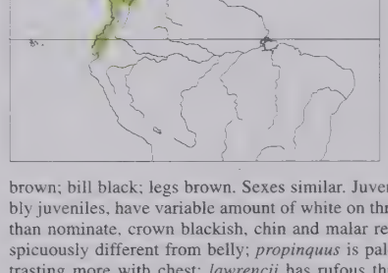
Descriptive notes. 15 cm; male 30·5–35 g, female 29–29·6 g. Has lores sooty black, ear-coverts and area behind eye deep orange-brown, bare skin around eye blue; crown sooty black, back and rump rich dark brown; shoulders, upperwing-coverts and remiges dark brown, primaries slightly lighter than secondaries; rectrices dark brown; chin brownish-grey, throat and chest deep orange-brown, upper belly buff-orange, flanks and lower underparts dark brown; eye brown; bill and legs black. Sexes similar. Juvenile is very like adult, but lower belly paler. Race *dichrous* is darker on head, wings and abdomen than nominate. Voice. Song a series of usually 3 or 4 ethereal, clear whistled notes in repeated cadence, often one rising note, one at same pitch and one falling, or variations on this theme, repeated continuously; quite different from songs of its two congeners. Call a harsh "churr".
Habitat. Wet montane forest, including epiphytic cloudforest with abundant growth of moss; mostly 1300–2300 m, in Colombia down to 700 m on Pacific slope.
Food and Feeding. No published data on food items. Mostly terrestrial in habits.
Breeding. Season apparently protracted; in Colombia, full-grown juvenile in Apr, birds in breeding condition in Jun, nest-building observed in Sept, and two juveniles attended by adults in Dec. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Quite common in parts of Colombia; scarce in Ecuador; uncommon to locally common in Peru. Some areas of its range lies within protected reserves. Occurs in e.g. Ucumarí Regional Park, in Colombia, and Cock-of-the-Rock Lodge, in Peru.
Bibliography. Best *et al.* (1997), Chapman (1917), Clements & Shany (2001), Cuervo *et al.* (2003), Davies *et al.* (1994), Fjeldså & Krabbe (1990), Graves (1985b), Hellmayr (1934), Hilty & Brown (1986), Meyer de Schauensee (1982), Miller (1963), Renjifo (1999), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Walker (2001).

83. **Song Wren**

Cyphorhinus phaeocephalus

French: Troglodyte chanteur **German**: Brillenzaunkönig **Spanish**: Cucarachero Canoro
Other common names: Northern Musician/Northern Musical Wren

Taxonomy. *Cyphorhinus phaeocephalus* P. L. Sclater, 1860, Esmeraldas, Ecuador.
May form a superspecies with *C. thoracicus* and *C. arada*. Sometimes regarded as conspecific with latter, an implausible treatment given the very distinct vocalizations of the two species. Six subspecies recognized.
Subspecies and Distribution.
C. p. richardsoni Salvin, 1893 – Caribbean lowlands of SE Honduras and E Nicaragua.
C. p. infuscatus J. T. Zimmer, 1932 – Caribbean lowlands of Costa Rica and NW Panama (Almirante).
C. p. lawrencii Lawrence, 1863 – Panama (except NW) and extreme NW Colombia (Golfo de Urabá).
C. p. propinquus (Todd, 1919) – tropical lowlands of NW Colombia.
C. p. chocoanus (Meyer de Schauensee, 1946) – W Colombia (from near Panamanian border) S to N Chocó.
C. p. phaeocephalus P. L. Sclater, 1860 – W Colombia (S Chocó) S to S Ecuador (El Oro).



Descriptive notes. 13-15 cm; mean 24·6 g. Has odd-shaped bill compressed laterally, with sharp arched culmen. Nominate race has lores blackish-brown, area behind eye and ear-coverts warm orange-brown; bare skin around eye grey-white or flesh-coloured, some blue at rear of eye; crown blackish-brown, upperparts rich dark brown, upper and middle back with very faint darker bars; outer webs of primaries and secondaries barred orange-brown and dark brown; rectrices dark brown with darker barring; chin, throat and chest warm orange-brown, chest side and belly medium brown, sometimes some white feathers on belly; eye brown; bill black; legs brown. Sexes similar. Juvenile is similar to adult; some individuals, possibly juveniles, have variable amount of white on throat. Race *chocoanus* is darker above and below than nominate, crown blackish, chin and malar region more conspicuously black, chest not conspicuously different from belly; *propinquus* is paler above and below than nominate, throat contrasting more with chest; *lawrencii* has rufous throat contrasting with paler chest; *infuscatus* is similar to previous but generally darker, crown more distinctly black; *richardsoni* has more brightly rufescent rump. Voice. Song a remarkable medley of clear, flute-like whistles, rising and falling, interspersed with harsh "chowk chowk-a-chowk chuck" noises; partners sing antiphonally, each sex contributing its own motif of whistled notes, the combination giving complicated medley, along with harsher "chowk" notes. Calls harsh and croaking, resembling parts of song; alarm a series of harsh churrs.
Habitat. Humid lowland forest and wet second-growth woodland; sea-level to 700 m, more rarely to 1050 m.
Food and Feeding. Apparently only invertebrates, small insects and spiders (Araneae), taken on or near the ground. Generally in family groups during much of year. Sometimes follows ant swarms.
Breeding. Jan–May, rarely Oct, in Costa Rica; in Panama season extends over 7 months, but individuals may breed for period of only 10 weeks; birds in breeding condition Mar–May in Colombia. Mature female may breed with same male for several seasons and then initiate divorce, even when alternative male not immediately available. Nest a bulky, untidy structure of coarse fibrous roots and leaf skeletons, built over thin branch with enclosed nesting chamber on one side, downward-sloping entrance on other, typically c. 0·6–2·5 m above ground; in study in C Panama, 78% of nests found were in acacia trees (*Acacia*) defended by aggressive symbiotic ants, but ant-defended nests no more successful than non-defended ones (in contrast to the situation with some *Campylorhynchus* species). Eggs usually 2, sometimes 3, white with variable amount of brown speckling around blunt end; no information on incubation and fledging periods; male offspring may remain with parents for 4–18 months after fledging, but, unlike some *Campylorhynchus* wrens, they do not provide assistance in rearing younger siblings.

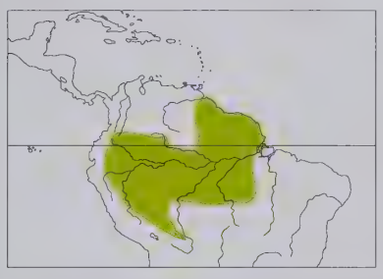
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Appears to be reasonably common over much of its range. Substantial habitat loss has occurred in several countries; whether this has caused any declines in this species' numbers is not known.
Bibliography. Best *et al.* (1997), Butler (1979), Chapman (1917), Cracraft (1985), Haffer (1975), Hellmayr (1934), Hilty & Brown (1986), Howell (1957), Loiselle (1988), Monroe (1968), Poulin & Lefebvre (1996), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robinson (1998a, 1998b), Robinson *et al.* (2000), Skutch (1940, 1960, 1985b), Slud (1960, 1964), Stiles & Skutch (1989), Wikelski *et al.* (2003).

84. **Musician Wren**

Cyphorhinus arada

French: Troglodyte arada **German**: Orpheuszaunkönig **Spanish**: Cucarachero Musical
Other common names: Musical/Southern Musical Wren, Quadrille Wren, Carillon Wren, Organ Wren (some races), Necklaced Jungle Wren (some races)

Taxonomy. *Myrm[ornis] arada* Hermann, 1783, Cayenne.
May form a superspecies with *C. thoracicus* and *C. phaeocephalus*. Sometimes regarded as conspecific with latter, an implausible treatment given the very distinct vocalizations of the two. It has been suggested that NE races possibly represent a separate species from W & S races. Species name often erroneously emended to *aradus*; the name is not of Latin origin but from a local native language, and as such must remain invariable. Eight subspecies recognized.
Subspecies and Distribution.
C. a. arada (Hermann, 1783) – E Venezuela, the Guianas and NE Brazil (E from lower R Negro, S to Amazon).
C. a. urbanoi (J. T. Zimmer & Phelps, Sr, 1946) – Gran Sabana (SE Bolívar), in SE Venezuela.
C. a. faroensis (J. T. Zimmer & Phelps, Sr, 1946) – region of Faro and Óbidos (probably also W to mouth of R Negro), on lower Amazon (Brazil).
C. a. transfluvialis (Todd, 1932) – base of E Andes in S Colombia (Caquetá) E to NW Brazil (E to R Negro).
C. a. salvini Sharpe, 1882 – S Colombia (Putumayo), E Ecuador and NE Peru (Loreto).
C. a. modulator (d'Orbigny, 1838) – lowlands of E Peru, W Brazil (E, S of Amazon, to R Madeira) and N Bolivia.
C. a. interpositus (Todd, 1932) – NC Brazil from R Madeira E to R Tapajós, S to N Mato Grosso.
C. a. griseolateralis Ridgway, 1888 – S bank of lower Amazon E of R Tapajós, S to R Jamanxim (Brazil).



Descriptive notes. 12·5 cm; 18–24 g. Nominate race has forehead and forecrown rufous, becoming chestnut-brown on rear crown; postocular supercilium pale buff narrowly bordered blackish; postocular stripe chestnut-brown, ear-coverts orange-brown, broad brownish-black collar with conspicuous longitudinal white streaks across shoulders and upper back; lower back and rump colder, less reddish-brown, than head; primaries and secondaries medium brown with narrow darker brown bars; rectrices medium brown with narrow darker brown bars; chin, throat and upper chest bright orange-brown, sharply separated from pale buff lower chest and belly; flanks and lower belly medium ochraceous-brown; eye brown; bill greyish-black above, greyish with whitish base below; legs brown or greyish-black. Sexes similar. Juvenile is similar to adult, may have indistinct barring on lower belly. Race *urbanoi* has collar, but is paler above and below than nominate; *faroensis* has very conspicuous white streaks on shoulders; *transfluvialis* is smaller and paler than nominate; *salvini* very dark, lacks streaked collar, has uniform brown auriculars and cheeks; *modulator* is closest to previous, but with more extensive supercilium, lighter upperparts; *interpositus* also lacks collar, has brownish-grey (not rufous) auriculars; *griseolateralis* has collar reduced in extent compared with nominate, is greyer below. Voice. Song, produced antiphonally by both sexes, is a series of clear, haunting whistles, varying greatly in pitch, the same phrase repeated many times with minor variation before switching to different motif, often interspersed with lower gurgling sounds. Call a harsh "churk".
Habitat. Lower levels of humid forest; in *várzea* in Brazil. Mostly sea-level to 500 m; occasionally to 1000 m, rarely to 1400 m, in Venezuela.
Food and Feeding. Mostly invertebrates; recorded prey items include caterpillars, beetles (Coleoptera), spiders (Araneae), millipedes (Diplopoda) and Crustacea. Berries also eaten. Usually found in pairs or family parties; does not usually associate with other species in mixed flocks, but occasionally follows ant swarms. Forages mostly on or near the ground, among debris and in leaf litter.
Breeding. Season quite protracted; eggs in Jul in Guyana, and fledged young in late Jul and nest with small young in Sept in Suriname. Nest roughly spherical, funnel-shaped neck with large entrance hole, made of leaf skeletons and coarse grass, lined with a few large feathers, usually supported across branch. Eggs 2, pure matt white. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Generally uncommon to fairly common over its sizeable range. Although much of its habitat has been destroyed or rendered unsuitable, large areas remain over much of its range. Occurs in a number of protected areas, including Manu National Park and Biosphere Reserve, in Peru.
Bibliography. Allen (1995), Bangs & Penard (1918), Beebe *et al.* (1917), Best *et al.* (1997), Butler (1979), Chapman (1917), Chubb (1921), Clements & Shany (2001), Cracraft (1985), David & Gosselin (2002a), Gyldenstolpe (1950), Haverschmidt (1968), Haverschmidt & Mees (1994), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Meyer de Schauensee (1982), Novaes (1974), Oren & Parker (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Robinson & Terborgh (1997), Sick (1993, 1997), Snyder (1966), Terborgh *et al.* (1984), Tostain *et al.* (1992).

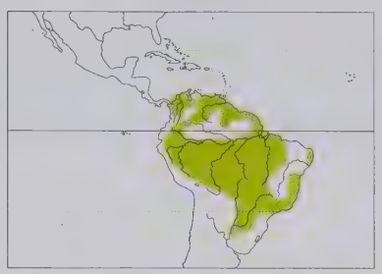
Genus *DONACOBIUS* Swainson, 1832

85. **Donacobius**

Donacobius atricapilla

French: Donacobe à miroir **German**: Rohrspottdrossel **Spanish**: Angú
Other common names: Black-capped Donacobius, Black-capped Mockingthrush

Taxonomy. [*Turdus*] *atricapilla* Linnaeus, 1766, Cape of Good Hope, South Africa; error = Brazil. Taxonomy long disputed: has frequently been thought to belong in family Mimidae, arguments for which treatment include large size, morphology (long tail, short rounded wings, heavy feet and legs), open cup-nest, and rambunctious and extroverted behaviour; in contrast, its well-developed social structure (with duetting vocalizations and mutual display) is very reminiscent of some troglodytids, notably in genus *Campylorhynchus*, in addition to which anatomical studies argue in favour of placement in present family; recent DNA studies, however, strongly suggest that this species is neither a mimid nor a troglodytid, but an aberrant "sylvioid", a group that includes the babblers (Timaliidae) and the Old World warblers (Sylviidae). Species name often erroneously emended to *atricapillus*, but *atricapilla* is a Latin noun and is thus invariable. Four subspecies recognized.
Subspecies and Distribution.
D. a. brachypterus Madarász, 1913 – Panama (E Darién) and NW Colombia (E to Santa Marta region, S to N Tolima).
D. a. atricapilla (Linnaeus, 1766) – N Venezuela, the Guianas, most of Brazil, Paraguay and extreme NE Argentina.
D. a. nigrodorsalis Traylor, 1948 – S & SE Colombia, E Ecuador and E Peru (S to Madre de Dios).
D. a. albovittatus d'Orbigny & Lafresnaye, 1837 – SW Brazil (Acre) S to N & E Bolivia (Beni, E Cochabamba, Santa Cruz).



Descriptive notes. 21·5–22 cm; 31–42 g. Nominate race has most of head and upperparts glossy jet-black, back suffused dark brown, rump warm olive-brown; primaries and secondaries dusky black, white base of primaries (conspicuous white patch visible on both open and closed wing); rectrices black, tipped white, amount of white increasing laterally, outer rectrix two-thirds white; chin buffy white, bare patch of deep yellow on each side of throat (not normally visible except during display); throat and chest warm buffy yellow, belly deep buff-yellow, upper flanks variably barred finely black; eye bright staring yellow; bill black; legs greenish-dusky. Sexes similar. Juvenile is dusky brown, rather than black, above, with pale line behind eye, the back medium brown, edged with rufous-brown, underparts unbarred and duller than adult's. Race *brachypterus* is smaller than nominate, lighter below, and with paler rump; *nigrodorsalis* is blacker on back; *albovittatus* differs from others in having prominent white supercilium. Voice. Sexes sing antiphonally, male a series of loud, ringing upward-slurred liquid whistles, "who-it, who-it, who-it", female a lower, sizzling or grating sound; other members of co-operative group may also sing, with sex-specific song. Calls are grating scolds.
Habitat. Brushy areas along riversides, especially in successional vegetation in oxbow lakes; also overgrown edges of artificial water impoundments. May forage away from riversides, but breeds only in marshy areas. Sea-level to 600 m; occasionally as high as 1400 m in Ecuador.
Food and Feeding. Food almost exclusively invertebrates; recorded items (Suriname) include hymenopterans, beetles (Coleoptera), orthopterans, neuropterans and arachnoids. Forages in pairs and in groups. Items usually taken from leaf surfaces, but occasionally caught in flight.
Breeding. Season very protracted in N of range, Jan–Aug, peak in May–Jul; in Peru mainly in rainy season, from Oct onwards, with majority fledging in Nov–Jan. Often breeds co-operatively, pair may have up to two helpers, offspring from previous year or the year before that, which help in nest defence and in brood-feeding; unassisted pairs less successful than assisted ones. Partners display by perching close to one another while singing, bobbing the head and waving the partly spread tail sideways rhythmically; other members of a co-operative group may also sing. Nest-building apparently mainly by female, which may pilfer material from nests of other species; deep bulky cup made of vegetable fibres, snakeskins, etc., c. 10–15 cm in diameter, cup 7·5–8 cm across and 6 cm deep, situated 0·25–1 m up, occasionally to 2 m, in vegetation, frequently over water; tends to be higher up when over dry ground; territories in good habitat can be very small, often only a few metres wide and up to 100 m long. Clutch usually 2 eggs in N South America, quite commonly 3 in SE Brazil (São Paulo), eggs purplish-white, thickly covered with purplish and reddish spots and blotches; incubation by female alone, period 16–18 days; hatchling naked, with conspicuous pattern of three black spots on pink base inside mouth (almost unique among Neotropical passerines); chicks fed by both parents, also by helpers if present, adults cool them by wetting own feathers prior to brooding; fledging period 17–18 days. Success apparently dependent on presence of helpers; unassisted pairs usually fledged only one young, whereas all observed cases in which two young were reared involved pairs with helpers.
Movements. Sedentary; in study of individually marked birds in Peru, no evidence of movement noted between suitable areas of habitat only 2 km apart.
Status and Conservation. Not globally threatened. Generally common throughout much of extensive range; abundant in suitable habitat in some areas. May in some cases benefit from human activity, as where water impoundments are allowed to become overgrown at edges.
Bibliography. Aguilar (1995), Anon. (1998b), Barker *et al.* (2002), Bloch *et al.* (1991), Clench *et al.* (1982), David & Gosselin (2000, 2002a), Griscom (1923), Hilty (2003), Hilty & Brown (1986), Kiltie & Fitzpatrick (1984), Lowen *et al.* (1996), Parker & Goerck (1997), Pozza & Pires (2003), Ragusa-Netto (1996, 1997, 1998), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Robinson (1997), do Rosário (1996), Schäfer & Phelps (1954), Sick (1993, 1997), Skutch (1968, 1985b), Tostain *et al.* (1992), Young (1925).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family MIMIDAE (MOCKINGBIRDS and THRASHERS)



- Medium-sized thrush-like birds, with short wings, long legs and long tail; generally dull-plumaged, mostly grey or brown, some with white or rufous.
- 19–32 cm.



- New World.
- Second growth, open woodland, scrub and desert habitats.
- 11 genera, 34 species, 85 taxa.
- 5 species threatened; none extinct since 1600.

Systematics

The family Mimidae is a relatively compact group of some three dozen species of ten-primaried oscine songbirds that extends broadly throughout the New World, from southern Canada south to the southern extremities of South America. Its species occupy mainly scrub and arid habitats, with a centre of diversity and radiation in south-western North America, but reaching, and radiating on, islands on both the Pacific and the Atlantic sides of the continents.

Mimids bear a superficial resemblance to other largely ground-foraging birds in both the Western Hemisphere and other parts of the world. Such superficially similar species are found particularly among the thrushes (Turdidae), a resemblance that accounts for the early classification of mimids with thrushes; it is reflected also in their early common names, such as "Curve-billed Thrush" and "Rufous Thrush" for, respectively, the California Thrasher (*Toxostoma redivivum*) and the Brown Thrasher (*Toxostoma rufum*). The term "thrasher" itself, in common use for species in the genera *Toxostoma*, *Oreoscoptes*, *Margarops* and *Ramphocinclus*, constituting 14 of the family's members, is likely derived from "thrusher" or "thresher", words of old English dialect and meaning "thrush" or "thrush-like". In fact, there are unrelated birds in other biogeographical regions that are ecologically equivalent and more similar to mimids, in terms of superficial morphology, than are thrushes. Good examples are found among the Old World babblers (Timaliidae), including African *Turdoides* species and, especially, Australian *Pomatostomus* species, among some African larks (Alaudidae) of the genera *Alaemon*, *Mirafra*, *Chersophilus* and *Chersomanes*, and especially in the South American earthcreepers (*Upucerthia*) of the family Furnariidae. All of these birds share with *Toxostoma* and related thrashers the habit of foraging on the ground in scrub or semi-desert, aided by long legs, a long tail and a long, decurved bill, and are excellent examples of convergent evolution.

The systematic disentangling of the mockingbirds and thrashers from the thrushes began in the middle of the nineteenth century, when C. L. Bonaparte erected the family name in current usage. This name, Mimidae, incidentally, takes precedence over the name "Toxostomidae", suggested by C. J. Sundevall in 1872. By the final decade of that century the family was a well-established entity. It took somewhat longer, however, for the generic names with which ornithologists are now familiar to become stabilized. Initially, North American mimids, mockingbirds and thrashers alike, were classified as species of *Mimus*, but J. Cassin, writing in 1853–1855, used the name *Toxostoma* for the western thrashers. Later, and well into the mid-1900s, thrasher species were widely referred to the genus *Harporhynchus*, but *Toxostoma*, by dint of the usual rules of nomenclatorial precedence, has carried the day.

In traditional taxonomic sequences over the last century or so, the mockingbirds and thrashers have remained in close prox-



By virtue of their conspicuous behaviour, and their distribution from southern Canada to Tierra del Fuego, the most familiar mimids are mockingbirds in the genus Mimus. *They have long tails, strong legs, slightly decurved bills and boldly patterned wings. Although two species are extremely familiar suburban birds across much of North America and the northern Neotropics, the main radiation is found in austral climes: six of the nine species of* Mimus *have ranges centred on Peru, Brazil, or countries further south. One of these, the* ***Long-tailed Mockingbird****, occurs in the semi-arid coastal lowlands of Ecuador and Peru.*

[*Mimus longicaudatus longicaudatus*, Cerro Chaparri, Lambayeque, Peru. Photo: Tui de Roy/ The Roving Tortoise]



The most diverse genus in the family is Toxostoma, *with ten species. This group of thrashers differs from* Mimus *mockingbirds chiefly in having more retiring habits, plainer wings and tail, and a longer, more dramatically decurved bill. The thrashers use the bill for sweeping aside sand and debris when foraging on the ground, a sideways swiping motion that necessitates a specialized cranial structure and associated jaw and neck musculature. The main radiation occurs in the arid scrublands and deserts of the south-western USA and north-western Mexico, where the ranges of six* Toxostoma *species, including the* ***Crissal Thrasher****, are centred.*

[*Toxostoma crissale*, Riverside County, California, USA. Photo: Brian E. Small]

imity to the thrushes, and adjacent to the wrens (Troglodytidae), to which they were thought to be most closely related. Recent evidence, however, supports a quite different affiliation, namely of mimids to starlings (Sturnidae). C. G. Sibley and J. E. Ahlquist used electrophoresis of egg-white proteins and DNA–DNA hybridization as means of examining the broader relationships among avian families, publishing their findings in 1984 and 1990. Their radically new taxonomy subdivided the oscine passerines, which include about one half of all avian species, into two "parvorders", which they called Corvida and Passerida. They further subdivided the latter into three superfamilies, Muscicapoidea, Sylvioidea and Passeroidea. The first of these encompasses the waxwings (Bombycillidae), the dippers (Cinclidae), the thrushes and the Old World flycatchers (Muscicapidae), as well as the family Sturnidae. In this arrangement, the traditional links between mimids and wrens, and between starlings and crows (Corvidae), were abolished. Sibley and Ahlquist concluded, in particular, that the Old World "Sturnini" and the New World "Mimini" were sister-tribes in the Sturnidae, and represented each other's closest relatives. This link is further strengthened by similarities in morphological attributes, namely jaw musculature and cranial structure, and also by serological studies. The Sturnini are Old World endemics and the Mimini New World endemics; the split between the two groups is thought to have occurred about 28–23 million years ago, when North America was last linked to Eurasia across the north Atlantic and climates were benign.

Nearly two-thirds of the species in this family are presently placed in two genera, *Mimus* and *Toxostoma*. The first of these includes the Northern Mockingbird (*Mimus polyglottos*), very widely distributed over most of North America, and the Tropical Mockingbird (*Mimus gilvus*), which extends from southern Mexico and the Caribbean southwards to north and east South America. The main radiation of this genus, however, is in temperate and subtropical South America, where *Mimus* is the only representative of the family, and where six other species occur. Two of these, the Long-tailed (*Mimus longicaudatus*) and Chilean Mockingbirds (*Mimus thenca*), are grouped together on account of their larger size and the possession of blackish "whiskers"; they occupy non-overlapping ranges west of the Andes. Four non-whiskered species occur east of the Andes, ranging from Surinam and Brazil south to southern Argentina and, marginally, southern Chile, with some degree of sympatry. Although all are typically found in open, scrub or desert habitats, one species, the Chalk-browed Mockingbird (*Mimus saturninus*), with an extensive range in eastern South America, has isolated populations in savannas and non-forested areas of lower Amazonia.

The second large mimid genus, with one more species than *Mimus*, is *Toxostoma*. This has a radiation centred in the arid scrublands and deserts of the south-western USA and north-western Mexico. Six of the ten *Toxostoma* thrashers have ranges that either include or are restricted to this region. Some attempt has been made to determine species relationships within the genus. For example, the California Thrasher, the Crissal Thrasher (*Toxostoma crissale*) and Le Conte's Thrasher (*Toxostoma lecontei*) form a rather distinct group of plain-breasted and long-billed, basically allopatric species that are considered to be each other's nearest relatives. Le Conte's Thrasher has a population isolate in the Central Valley of southern California, and another in Baja California has been proposed as a distinct species, "*Toxostoma arenicola*". These species are distinct from congenerics that have a spotted breast and a somewhat less curved bill. With regard to the latter, close relationships are recognized among three species of eastern North America, these being the Brown Thrasher, the Long-billed Thrasher (*Toxostoma longirostre*) and the Cozumel Thrasher (*Toxostoma guttatum*), the last confined to the island of Cozumel, off Mexico's Yucatán Peninsula. The term "superspecies" has been used for these various species groups. Two other members of this genus, Bendire's Thrasher (*Toxostoma bendirei*) and the Grey Thrasher (*Toxostoma cinereum*), are allopatric and thought to be sister-species, but the affiliations of two largely Mexican species, the Curve-billed (*Toxostoma curvirostre*) and Ocellated Thrashers (*Toxostoma ocellatum*), are less clear.

Three other mimid genera, all monotypic, are of mainland distribution, apart from a few populations on near-shore islands. One contains the Sage Thrasher (*Oreoscoptes montanus*) of the Great Basin desert of the western USA, which is regarded as closer to *Mimus* than to the *Toxostoma* thrashers. The two catbird genera, *Dumetella* and *Melanoptila*, comprise species of northern and eastern temperate distribution, one ranging widely over the eastern and central parts of the USA and spending the non-breeding season south of the Mexican border, and the other restricted to the Yucatán Peninsula. The two are phylogenetically close, and the Black Catbird (*Melanoptila glabrirostris*) is sometimes placed together with its more widespread northern relative in *Dumetella*. In contrast, the two species of *Melanotis* are typical of tropical and subtropical scrub and edge habitats in Mexico.

The Blue Mockingbird (*Melanotis caerulescens*) occurs north of the Isthmus of Tehuantepec and the Blue-and-white Mockingbird (*Melanotis hypoleucus*) is found on the other side of it.

The remaining genera in the family, representing a good percentage of its diversity, consist of island taxa, presumably derivatives of mainland ancestors that successfully reached and persisted on the islands. Perhaps as a result of the propensity of mimids for living in open, edge or disturbed habitats in general, the family has demonstrated a truly remarkable ability for island colonization, and thence divergence into distinct island taxa. As a consequence, there is a notable variety of endemic genera, 45% of the family total, on islands off both the eastern and the western mainland coasts. Five genera, containing ten of the family's 34 species and 26 of its 85 accepted taxa at subspecies (or monotypic species) level, are restricted to various of these islands. If two insular species in other genera, the Bahama Mockingbird (*Mimus gundlachi*) and the Cozumel Thrasher, are taken into account, then the figures rise to twelve species and 29 subspecies, or 35% and 34% of the respective totals.

Caribbean islands are the setting for the most spectacular evolution of insular endemic mimids. A substantial radiation has resulted in a traditional taxonomy that distinguishes three genera, *Cinclocerthia*, *Margarops* and *Ramphocinclus*, containing two, two and one species, respectively. *Margarops* has a wide range in the Caribbean, extending from the Bahamas southwards through the Greater Antilles to the Lesser Antilles, and including South American islands off the north coast of Venezuela, but the other two genera are restricted to the Lesser Antilles. In contrast to the traditional taxonomy, recent molecular evidence supports recognition of the three distinct clades of *Cinclocerthia* at the species level; it also indicates that *Margarops* should be divided into two genera, with the widely distributed Pearly-eyed Thrasher (*Margarops fuscatus*) retained in that genus and the resurrection of *Allenia* for the Scaly-breasted Thrasher (*Margarops fuscus*) of the Lesser Antilles. All these genera are considered likely, again on the basis of molecular evidence, to be monophyletic with the catbird genus *Dumetella* of the North American mainland, although *Ramphocinclus* may be the product of an earlier invasion. The island forms diverged around 4 million years ago, and commonly three or four of these Caribbean endemic species co-occur on larger islands in the central Lesser Antilles.

There are two mimid genera found only on Pacific islands. These are the monotypic *Mimodes*, restricted to Socorro Island, off the west coast of Mexico, and, most notably, a radiation of species in the genus *Nesomimus* on the Galapagos Islands, west of Ecuador. Both are likely derivatives of mainland *Mimus* species. Species boundaries among the mockingbirds of the Galapagos are not well understood, but most authorities recognize four distinct species, no two of which occur on the same island, and three of which were collected by Charles Darwin. They are undoubtedly the products of a single, ancestral colonization event, perhaps by the mainland Long-tailed Mockingbird. One of the island taxa, the Galapagos Mockingbird (*Nesomimus parvulus*), is widespread. Two others, the San Cristobal Mockingbird (*Nesomimus melanotis*) and the Espanola Mockingbird (*Nesomimus macdonaldi*), are restricted to the single islands of those respective names. The fourth, the Floreana Mockingbird (*Nesomimus trifasciatus*), is confined to a few islets adjacent to Floreana, on which larger island it is now extinct, although it was common there in Darwin's time. The Galapagos mockingbirds are remarkable chiefly for their co-operative breeding habits (see Breeding). This behaviour is not known to occur among other members of the family, with the possible exception of one or two mainland *Mimus* species and the White-breasted Thrasher (*Ramphocinclus brachyurus*) on the Caribbean island of St Lucia, although it is commonly practised by mimid counterparts elsewhere, such as the Old World babblers.

Several systematic questions concerning the Mimidae remain unresolved, which leaves ambiguities in the number of acceptable genera and species. Depending on various taxonomic ideas, nine to twelve genera and 28–37 species could be recognized. Among the interesting and debatable questions in the classification involving island taxa are the following. Should the Scaly-breasted Thrasher be separated from the Pearly-eyed Thrasher and be placed in its own genus *Allenia*? Should the Tropical Mockingbird derivative on San Andrés be raised to full species status, as *Mimus magnirostris*? Does the Cozumel Thrasher deserve its current full species status or should it be merged with the mainland Long-billed Thrasher? There are similar questions relating to mainland taxa. For example, should the Black Catbird be moved to *Dumetella*, rather than being retained in a monotypic genus? Should the two *Melanotis* mockingbirds on each respective side of the Isthmus of Tehuantepec be con-



The propensity of mimids to cross large stretches of open sea has allowed them to colonize an array of oceanic islands in the Caribbean and western Pacific, where they have speciated. Indeed, within the family as a whole, as many as twelve of the 34 species are confined to islands. One of the best known radiations is found in the Galapagos, where the genus Nesomimus *has evolved and diversified from a single mainland ancestor. Of four resultant species, the* ***Galapagos Mockingbird*** *is the most widespread, occurring on dozens of large islands and associated islets.*

[*Nesomimus parvulus parvulus*, Fernandina, Galapagos. Photo: Günter Ziesler]

sidered conspecific, despite their dramatic differences in appearance? On the other hand, should the taxonomic status of the isolated population of Le Conte's Thrasher in Baja California be raised to that of a full species, under the name of *Toxostoma arenicola*?

In some of these instances, the case for enhanced nomenclatorial distinctions, or "splitting", is supported by DNA evidence that suggests only distant common ancestry and considerable differences at the genetic level. Often, however, this is offset by a lack of divergence between taxa at the morphological, ecological or behavioural levels. Where arguments for taxonomic distinction rest largely on size or bill differences, as is the case with the San Andrés mockingbird, they are tempered by consideration of the ubiquity of such morphological changes, especially in island populations, and especially in bill dimensions. Thus, there seems no compunction to regard such changes as anything other than the products of local selective regimes comprising different habitats and different suites of competitors, and not necessarily indicative of wholesale or species-level adaptations.

As discussed by E. A. Sgariglia and K. J. Burns, distributions of genealogical lineages within a given species are probably the result of complex series of ecological and historical events. These authors investigated the evolutionary history of populations of the California Thrasher by undertaking a nested-clade analysis of the variation in mitochondrial DNA among samples from different parts of the species' range. The results, in combination with other phylogeographical factors examined, suggested that the species had a southern ancestry and that an early division between northern and southern populations took place; this was followed by a northward range expansion, and a later expansion back into southern regions already inhabited by the species. In addition, the authors' identified isolation by distance, particularly in southern California, so that gene flow between different localities, although it occurs, would seem to be restricted.

Pending resolution of the uncertainties, and in some cases the probable formal recognition of the newer taxa that the molecular evidence supports, it is considered better at present to follow more traditional lines with regard to the treatment of genera and species. This somewhat conservative stance is also that taken recently by the compilers of the American Ornithologists' Union 1998 *Check-list of North American birds*. Future research is likely to shed much additional light on these complex matters.

Morphological Aspects

Mimidae is made up of relatively close-knit genera and the species are morphologically rather homogeneous, with few significant departures from the familial norms. This generalization is somewhat more compelling if one includes in it only *Mimus*, *Oreoscoptes* and *Toxostoma* and their derivatives, some 26 of the total of 34 mimid species. It is less precise if the Middle American *Melanotis* mockingbirds, and the *Dumetella* and *Melanoptila* catbirds and their Caribbean island derivatives, are included, as these are rather more divergent in habits and habitat, and therefore in morphology. Species in the former group, for example, share the characteristic of a single scute at the base of the outer toes, whereas in species of the latter group the foot scutes are divided. A further distinction is that the members of the first grouping are larger, more plainly coloured and more terrestrial species, whereas the species in the second group are smaller, more arboreal and, in tropical latitudes, rather more brightly patterned and coloured.

In size, the mimids span a modest range of some 20–30 cm in total length and about 40–120 g in weight, with the two catbirds being the smallest, and several species of *Toxostoma* and *Margarops* thrashers collectively the largest of the family. Most species exhibit little, if any, sexual dimorphism in either coloration or size. The sexes of many thrasher species are scarcely distinguishable in terms of weight, but males are on average 9% heavier than females in the case of the Curve-billed Thrasher and 8% heavier in the Northern Mockingbird. Males of the Socorro Mockingbird (*Mimodes graysoni*) weigh on average 6% more than females, but the genders are more easily separated by a combination of wing and tarsus lengths, which are longer in males. Sexual dimorphism is similarly modest in three of the four *Nesomimus* mockingbirds, males of which are about 10% heavier than females, but in the fourth, the Espanola Mockingbird, the males are 17% heavier than the females. In contrast, the weight of the female Sage Thrasher exceeds that of the male range-wide by about 10%, and the same applies also in the case of breeding Grey Catbirds (*Dumetella carolinensis*).



Catbirds are anomalous mimids with relatively plain plumage and short, straight bills. The Grey Catbird (Dumetella carolinensis) *is distributed across eastern and central parts of the USA, migrating to Central America in the non-breeding season. The* ***Black Catbird****, meanwhile, is restricted to the Yucatán Peninsula. Both species are placed in monotypic genera, though the southern form perhaps represents a sort of melanistic version of its better-known counterpart. Future research may uncover a close evolutionary relationship between the two, supporting a merger of* Melanoptila *and* Dumetella*; in such a case, the latter takes priority as the genus name.*

[*Melanoptila glabrirostris*, Cozumel Island, Mexico. Photo: Johannes Ferdinand]

A noteworthy morphological feature of several of the endemic Caribbean mimids is that females not only are larger in size than males but also, especially, have a longer bill. This situation, known as "reversed" sexual dimorphism, occurs in the Pearly-eyed Thrasher, but it is particularly striking in the Brown Trembler (*Cinclocerthia ruficauda*). In the case of the latter, the extent of the gender-related dimorphism varies among island populations, and weight dimorphism is substantially less than is that of bill length. Similar reversed sexual dimorphism is apparent in other avian groups, notably raptors such as accipitrine hawks, and owls (Strigiformes), and among factors cited as responsible for it are the female's role in egg-production and nest defence, both presumably enhanced by larger body size, and the wider range of prey available to smaller males, which are primarily responsible for early nest-provisioning to the female and chicks. It is possible that parallel arguments could be advanced to account for the phenomenon among some island mimids, along with the influences of varying food resources and variation in the incidences of other birds that compete for them. This would be an interesting topic for detailed studies, which are presently lacking.

For a majority of the Mimidae, those with the "typical" family attributes of largely terrestrial habits (see General Habits), the most conspicuous morphological features are long legs, a long tail, and often a long, robust and curved bill. The first two features are characteristic of many, unrelated birds that forage largely on the ground. As an adaptation to feeding among the accumulated plant detritus within and below shrubs, long legs elevate the bearer above the substrate, and provide some leverage and stability for "thrashing" and digging. Further, in typical mimid species, locomotion over short distances, and even much longer ones, is customarily achieved by running, rather than by flying (see General Habits). Clearly, long, strong legs are an asset to such behaviour, perhaps more from predator-evasion considerations than from foraging ones. Nestling thrashers are very noticeably "leggy" creatures, and when out of the nest they can run well before they can fly.

Long tails are traditionally thought to be an adaptation for terrestrial locomotion among ground-foraging birds, essentially providing balance. A tail held lowered when the bird is running is often elevated abruptly, as a braking aid, when it stops. The Brown and Grey Tremblers (*Cinclocerthia gutturalis*) of the Lesser Antilles are rather short-tailed, and both are arboreal; the catbirds and the tropical Blue and Blue-and-white Mockingbirds also forage largely above the ground, and likewise are not conspicuously long-tailed.

A long, strong and decurved bill is a notable feature of most of the *Toxostoma* thrashers. It is also possessed by other mimids in areas where these thrashers are absent, as demonstrated by the two tremblers and the White-breasted Thrasher on Caribbean islands, *Mimodes* on Socorro Island, and *Nesomimus* on the



The genus Melanotis *contains two mockingbird species, both of which are unusual in their bluish plumage. The* ***Blue Mockingbird*** *is endemic to Mexico, occurring north of the Isthmus of Tehuantepec, while its close relative the Blue-and-white Mockingbird* (M. hypoleucus) *occurs southward to Honduras and El Salvador. The northern form is essentially dark blue, streaked paler blue on the crown throat and chest, while the southern form is similar apart from its strikingly white underparts, from throat to belly. Both species have a diagnostic blackish mask extending from the lores to the auriculars.*

[*Melanotis caerulescens caerulescens*, Mexico. Photo: Patricio Robles Gil]



In the traditional taxonomic sequence the genus Cinclocerthia *contains two species of mimid, but recent genetic analysis suggests there may be three. The genus itself, however it is subdivided, comprises a fairly well-defined insular radiation restricted to the Lesser Antilles. Each of these Caribbean islands is occupied by a single representative, St Lucia and Martinique being home to the* ***Grey Trembler****. This species typifies the genus in its long, straight bill, its relatively short tail and its unpatterned upperparts. Likewise, it is more a bird of humid forests than most other mimids, and its lifestyle is more notably arboreal.*

[*Cinclocerthia gutturalis macrorhyncha*, Edmund Forest Reserve, St Lucia, Photo: Doug Wechsler/ VIREO]



*The **Pearly-eyed Thrasher** is another specialized inhabitant of Caribbean islands, amongst which it is quite widespread from the Bahamas to Bonaire. A large, brash, conspicuous species of dense thickets and dry forests, it currently shares the genus* Margarops *with the Scaly-breasted Thrasher* (M. fuscus), *although previous morphological analysis, backed up by recent genetic work, hints that the latter should be removed to* Allenia. *Both these species are allied to the tremblers, but, aside from the fact that they do not tremble, they differ markedly in habitat choice and bill morphology.*

[*Margarops fuscatus densirostris*, Morne Diablotin, Dominica. Photo: Roland Seitre]

Galapagos. On the small south-western Caribbean island of San Andrés, the resident subspecies of the Tropical Mockingbird, sometimes recognized as a separate species (see Systematics), is distinguished from other races by its distinctly larger and longer bill. The chief uses to which the long, curved bill is put are in foraging tactics (see Food and Feeding).

These impressive curved bills, while widespread among several mimid taxa, are absent in Bendire's Thrasher and in mainland *Mimus* mockingbirds. Characteristically, these shorter-billed species co-exist with one or another of the long-billed *Toxostoma* thrashers in the same vegetation. In a similar fashion, the two *Margarops* thrashers are sympatric on several Lesser Antillean islands, with one being conspicuously longer-billed than its congener. The Northern Mockingbird co-exists with the larger and longer-billed Pearly-eyed Thrasher, one of these *Margarops*, on Puerto Rico. In the 1970s, it also colonized Socorro Island, which it shares with the endemic Socorro Mockingbird. The two are similar in size and both are basically short-billed, but they occur in different habitats, the recent invader being found only in the disturbed and more open vegetation.

The evolution of long bills and the attendant side-swiping foraging tactics of several *Toxostoma* species has been accompanied by specialized development of the cranial structure and the jaw and neck musculature, as was described by W. Engels in 1940. Comparable structures might be looked for in other mimids that share similar bills and habits, and are expected to be present in the ecologically equivalent birds of other continents, such as some of the Old World timaliids.

In appearance, the great majority of the Mimidae are rather bland, being variously greyish or brownish in coloration above, and paler below. This modest, if not drab, mien is alleviated in a number of cases by the presence of a spotted or streaked breast, and nearly all species that are otherwise plainly coloured have black or white head, wing or tail markings that add considerable distinction. Among the *Toxostoma* species, those of the more humid regions of the eastern USA and Mexico, the Brown Thrasher and its relatives the Long-billed and Cozumel Thrashers, are brown-backed, in contrast to their basically grey-backed congeners of the south-western arid regions. The California Thrasher, a denizen of Mediterranean-climate chaparral, is markedly darker and browner-backed than its desert relatives. The *Mimus* mockingbirds are generally greyish above, but several Neotropical species, including the Chilean, Brown-backed (*Mimus dorsalis*) and White-banded Mockingbirds (*Mimus triurus*), are somewhat browner dorsally. A spotted, scaly or streaked breast is a characteristic of some thrasher groups, of some mainland and island *Mimus* and *Mimus* derivatives, and of the Caribbean *Margarops* thrashers. In the case of some mockingbirds with plain-breasted adults, such as the Socorro and Chilean Mockingbirds, the juveniles are distinguished by their breast streaking, which is lost when adult plumage is gained.



*As well as being the smallest members of the family, the catbirds are amongst the least terrestrial, as a result of which their bills and tails are unusually short for the family. At a glance they resemble diminutive, slender thrushes (Turdidae), rather than mockingbirds or thrashers. The plumage of the **Grey Catbird** is a soft slaty grey, offset by a black cap and a chestnut-brown crissum, the latter feature reappearing elsewhere in the family, most notably in the genus* Toxostoma. *One of its calls bears an uncanny resemblance to the mewling of a cat, a fact duly noted by the European settlers who gave this bird its English name.*

[*Dumetella carolinensis*, Long Island, New York, USA. Photo: Tom Vezo]



The majority of mimids live in semi-arid habitats, as illustrated biogeographically by the genus Mimus *in South America. The dry Pacific coastal zone from Ecuador to Chile accounts for two endemic species, with a third in the arid Andes of Bolivia and north Argentina. The similar dry zones of Brazil and Argentina are partitioned amongst three more species: the Patagonian Mockingbird* (M. patagonicus) *occupies the stunted shrublands of the far south; the* **White-banded Mockingbird** *occupies taller* monte *scrub and low Chaco woodland; and the Chalk-browed Mockingbird* (M. saturninus) *occupies savanna-like* cerrado, *invading Amazonia wherever large-scale deforestation occurs.*

[*Mimus triurus*, Argentina. Photo: Günter Ziesler]

Among well-studied members of the family, downy nestlings begin their very first moult in the nest, and complete it to acquire juvenile plumage, in most cases only subtly different from that of the adult, outside the nest. In general, mimids undergo an annual moult in late summer to early autumn, most North American species moulting during July–September.

The most radical departures from the usual grey-brown upperparts and paler but sometimes spotted underparts are found in the catbirds. Both are aptly named. The northern species, the Grey Catbird, is all grey with a black cap and a dark chestnut-brown crissum, and the Yucatán species, the Black Catbird, is entirely black. The two *Melanotis* mockingbirds are blue above and either blue or white below, with a black ear patch, and the White-breasted Thrasher, also black-eared, is dark above and white below.

Even in the dullest-coloured mimids, the plumage is embellished with white markings that, besides their function in intraspecific displays (see General Habits), serve as convenient field markings for the observer. The incidence of white wing patches and/or white tail markings is widespread among the species of several genera. Wing patches are a common feature of *Mimus* mockingbirds, and they may be very large and conspicuous, or smaller and fairly obscure, but they are lacking in some members of this genus. Sympatric species seem to be dissimilar in this respect, conspicuous patches being present in one species and absent in the other; examples are the Northern and Tropical Mockingbirds, sympatric in southern Mexico, and the White-banded and Chalk-browed Mockingbirds, sympatric in northern Argentina, the former in each case having the large wing patches. In addition, white tail tips and/or white outer tail feathers are common among the *Mimus* species, and are exhibited also by the Sage Thrasher and the Caribbean *Margarops* thrashers.

Dull coloration is further countered in most mimids by various facial markings. The black ear patches of the *Melanotis* mockingbirds, mentioned above, are shared with the *Nesomimus* mockingbirds in the Galapagos and the *Cinclocerthia* tremblers in the Caribbean, and white lines above the eyes, often in conjunction with adjacent black stripes, are also common. Many *Mimus* species have a white "eyebrow", or supercilium, above a dark or black eyeline. The Sage Thrasher has a white eyebrow, as does the Ocellated Thrasher, and several other thrashers have white or black malar or submalar lines below the cheek and above a paler throat.

Iris colours are often distinctive, and can add flair to an otherwise plain appearance. Among the Mimidae, the iris colour ranges from black and brown to reddish, orange, yellow and white. In some cases, the most closely related species often differ with regard to eye colour, as illustrated within the genera *Margarops* and *Toxostoma*, and this character seems therefore not to be a conservative taxonomic parameter.

The final feature of some distinction in the appearance of certain mimids is the coloration of the undertail-coverts, or crissum. This area is conspicuously coloured, in contrast to both the upperparts and the belly, in the Grey Catbird, and among the *Toxostoma* species its colour ranges from bright cinnamon-rufous to tawny-brown and to pale buff.

Habitat

All of the mainland mimids, north and south of the equator, typically live in low and rather open scrubby habitats, and less usually in the undergrowth of low woodland or in savanna. The majority of species inhabit the more arid parts of the two continents, where they occupy various sorts of desert and semi-desert vegetation. Away from the desert regions, woodland edge or scrubby second growth, or riparian vegetation in more open country, are the preferred habitats of the three common mimids of the eastern half of the USA, namely the Grey Catbird, the Northern Mockingbird and the Brown Thrasher. The same applies to the South American Chalk-browed Mockingbird at its lower tropical latitudes, which include the Amazon Basin. This species occupies open savannas and also cleared, deforested areas within the rainforest region, so long as a few bushes and low trees remain. At tropical latitudes in Mexico, the Black Catbird inhabits scrubby edge and low woodland on the Yucatán Peninsula, but it drops out to the south when the woodland becomes taller and evergreen. Found in similar habitats on the Pacific coast is the Blue Mockingbird, which follows the dense, bushy understorey of low tropical deciduous woodland well north into the north-western state of Sonora. Its allopatric congener, the Blue-and-white Mockingbird, is found in scrub, edge and second-growth habitats far-

ther south, to Honduras and El Salvador. The Tropical Mockingbird has a range entirely within tropical latitudes, but it also eschews forest and is typical of the driest, open or disturbed sites, essentially the same habitats as those exploited by its northern congener, the Northern Mockingbird, from the Isthmus of Tehuantepec all the way north to Canada.

The most significant departures from this association with open and more arid habitats are exhibited by the endemic Caribbean genera, and in particular by the *Cinclocerthia* tremblers, both of which may be found in evergreen tropical forest at higher elevations. This pattern is repeated to some extent in the Galapagos Islands, where the *Nesomimus* mockingbirds occupy not only the arid scrub of the lowlands, but also upland mesic forest on some of islands' volcanoes.

Outside desert and semi-desert habitats, with their naturally low, sparse and open vegetation, several mimids have clearly benefited, probably in terms of both geographical range and breeding density, from the clearing and opening-up of woodland and forest habitats by humans. Several non-desert species thus occupy edge and second-growth habitats where the natural vegetation cover would have precluded their presence. This is true for species equally of tropical and of temperate latitudes. Suburban parks and gardens, fitting the prerequisites for open but bushy or sparsely treed sites, provide appropriate habitat for several mimid species, which are therefore very familiar birds even to townsfolk. Indeed, the Northern Mockingbird must be one of the most widely recognized birds in the USA (see Relationship with Man). The Tropical Mockingbird is similarly ubiquitous in cities and towns of the northern Neotropics, and several other mimids of the South American temperate regions, including the Chalk-browed, White-banded and Chilean Mockingbirds, are familiar birds of agricultural landscapes and populated areas.

The number of species of any higher taxon co-occupying a habitat at a given site is known as the "α-diversity" of that taxon. For the Mimidae, the α-diversity is usually a single species, or perhaps two, with short-billed and long-billed species co-existing together, as discussed above (see Morphological Aspects). A general rule for this family is that related species either occupy different habitat types, being then termed "β-replacements" and contributing to a β-diversity component in the family's overall diversity, or occupy the same habitat but have different ranges within that of the habitat ("γ-replacements", contributing to a γ-diversity component). The northern deserts each have characteristic thrasher species that are β-replacements: the Sage Thrasher in the steppe-deserts of the Great Basin, Le Conte's Thrasher in the Mojave Desert, and the Curve-billed Thrasher in the Sonoran and Chihuahuan Deserts, often with the addition of the Northern Mockingbird or Bendire's Thrasher in taller desert scrub.

From California south to central Mexico, a dense scrub vegetation occurs between oak (*Quercus*) woodlands and lower, more open scrub of the sagebrush (*Artemisia*) type, at intermediate position on precipitation gradients. This vegetation, variously termed chaparral, *encinal* or *matorral*, is occupied by the California Thrasher in Alta and northern Baja California, by the Crissal Thrasher inland at the desert edge and in mountain foothills south to central Mexico, and by the Ocellated Thrasher in the highlands of Oaxaca adjacent to the local oak woodland there. The three species occupy similar habitat, are allopatric, and would classify as γ-replacements within chaparral vegetation, broadly construed. Similarly, the Curve-billed Thrasher occupies dry thorn-scrub, as well as deserts, throughout northern Mexico, but in the thorn-scrub of the Cape Region of southern Baja California the Grey Thrasher is the family's representative.

In central to northern Argentina, three *Mimus* species have partly overlapping ranges, but they differ with regard to the typical habitats in which they are found. In one pair of extensively sympatric species, the White-banded Mockingbird is typical of low Chaco woodland and *monte* scrub, whereas the Patagonian Mockingbird (*Mimus patagonicus*) prefers lower desert scrub and steppe. The White-banded Mockingbird is extensively sympatric also with the Chalk-browed Mockingbird to the north-east, but the latter is typical of more open, savanna-like country. A fourth species that occurs east of the Andes, the Brown-backed Mockingbird, prefers arid foothill scrub not unlike that occupied by the Patagonian and White-banded Mockingbirds farther south, but its more northerly range, extending from Bolivia south to Tucumán, in north-west Argentina, precludes much contact between it and its more southerly congeners.

General Habits

In their general comportment, the majority of typical mimids are conspicuous by dint of their striking vocalizations and frequent



*The **California Thrasher** is one of several mimids specializing on low-stature vegetation in the Californian Floral Kingdom. In Alta and northern Baja California it frequents the dense scrub formation, variously termed chaparral,* encinal *or* matorral*, that is typical of intermediate points on the precipitation gradient, between well-watered oak* (Quercus) *woodland and low-lying, dry scrub of the sagebrush* (Artemisia) *type. It also occurs, but usually at lower densities, in oak woodland with scrubby understorey, in well developed sagebrush saltbush* (Atriplex)*, in juniper scrub, and in stunted woodland of piñon pines and Joshua trees.*

[*Toxostoma redivivum*, California, USA. Photo: Dave Maslowski/ Maslowski Productions]



The association between mimids and arid or semi-arid landscapes only breaks down on a few Caribbean islands, where some members of the family tolerate, or even prefer, more humid habitats. This is especially true of the tremblers, both of which may be found in taller forests at higher elevations. The only mimid that qualifies as a true rainforest bird in most of its range is the ***Brown Trembler****, a species that usually eschews drier formations and restricts itself to humid forest. On Dominica, for example, it is common in windward evergreen forest and rainforest, but scarce in leeward dry forest, plantations and montane thickets.*

[*Cinclocerthia ruficauda tremula*, Guadeloupe. Photo: Regis Cavignaux/ Bios]

use of exposed song perches at bushtops in low, scrubby vegetation. On the other hand, many of them, owing to their unobtrusive coloration and terrestrial foraging, are difficult to observe when they are not singing. When engaged in foraging or nesting activities, many mimids are quite inconspicuous, remain in the densest cover, and are, indeed, frequently difficult to detect. This is not only because they conduct these activities often in dense vegetation on or near the ground, but also because they are in general rather retiring birds, and some of them are exceedingly elusive. The Crissal Thrasher epitomizes this description; it is notoriously difficult to observe at close quarters, and extremely effective at retreating to the far reaches of its territory without offering sight or sound of itself. California and Ocellated Thrashers are very much like the Crissal Thrasher in this respect. All three are easy enough to locate and identify when singing 50–100 m away, but it is extremely difficult to approach them or even to find them at closer distances.

Further, locomotion over short distances, and even much longer ones, is customarily achieved by running, rather than by flying. Indeed, many mimid species appear markedly reluctant to fly from a source of disturbance, and their escape to cover is readily accomplished by running. The desert thrashers of the south-western USA are noted for their abilities to streak away from the observer, running across open ground and quickly disappearing into the sparse vegetation. Some, such as the Crissal, Curve-billed and Le Conte's Thrashers, will even leave exposed song perches by slipping down through the brush to the ground, to make their escape on foot rather than by flying. Although these and other members of the family nest above the ground and sing from high points in the vegetation, access to both is often gained by climbing through the bushes, and not by flight. Such behaviour is recorded for many North American mimids, and also for South American *Mimus* species.

This combination of characteristics, involving noisy, persistent and even exuberant vocalists on strongly defended territories, but with a propensity to avoid approach and intolerant of close observation, well describes most of the better-known mimid species. In this respect, they are quite the opposite of most small and medium-sized birds, which are difficult to locate from afar but, once located, are easily approached and observed. Perhaps like many other larger passerines that spend most of their time low in dense vegetation, these catbirds, mockingbirds and thrashers seem to find ample time for quiet loafing and preening when not engaged in nesting or territorial activities. Such are the benefits of a private and retiring lifestyle.

The use of exposed songposts at the top of the vegetation is not universal among the family's members. Species that inhabit dense shrubbery and woodland-edge vegetation customarily sing from within the vegetation; the Grey Catbird of the eastern USA and the Central American *Melanotis* mockingbirds are examples of species that are rarely seen to sing from exposed positions. In low and scrubby woodlands in Argentina, Patagonian and White-banded Mockingbirds sing from perches 3–5 m above the ground, but still a half-metre or so below the treetops.

The more apparent aspects of thrasher and mockingbird behaviour are attributable to their being highly territorial species.



The ***Brown Trembler****, as its name suggests, has a diagnostic display in which its wings are drooped a couple of centimetres, then quivered for about one second, and then returned to the original position. Both sexes display regularly, usually every few seconds, but the rate increases in the presence of conspecifics. The fact that trembling is more frequent in social contexts suggests that it is an important intraspecific signal, perhaps to maintain contact between pair members. Interestingly, this species lacks a contact call.*

[*Cinclocerthia ruficauda ruficauda*, Dominica. Photo: John F. Cooper]





Some mockingbirds in the genus Mimus *often hold their wings open for anything from a split second to a few seconds. It seems clear that "wing-lifting", or "wing-flashing", has evolved to show off their gleaming white underwings, or strikingly patterned upperwings, but, in contrast to the situation in tremblers, the context is not always social. The* ***Chalk-browed Mockingbird*** *opens its wings during squabbles over food and when posturing in front of rivals or potential mates, but it also uses this display in non-social contexts. Thus an individual may flash its wings when alighting on bushtops, singing, foraging, or when challenging predators near the nest, when conspecifics are not in view. Likewise, a solitary* ***Patagonian Mockingbird*** *will use this display at seemingly random intervals when foraging on the ground. This curious behaviour is easily observed at tourist spots and coastal car-parks, where tame individuals have learnt to take scraps from picnickers. The function of wing-flashing in solitary foragers is not clear, but it probably relates to territoriality or predation, or both. It may be directed at distant conspecifics, as a signal of presence and ownership, or it may be directed at predators as a sign of vigilance, alertness and liability to escape, as is suspected of tail-flicking in Common Moorhens* (Gallinula chloropus), *and stotting in Thomson's gazelles* (Gazella thomsoni).

[Above: *Mimus saturninus frater*, Governador Valadares, Minas Gerais, Brazil. Photo: Edson Endrigo

Below: *Mimus patagonicus*, Península Valdés, Argentina. Photo: Francisco Erize]





Although there is very little on record about bathing and preening in mimids, they are popular pastimes amongst the thrashers at least, as illustrated by these fine portraits. The first shows a ***Long-billed Thrasher*** *and the second a* ***Brown Thrasher****, two very similar species in the genus* Toxostoma. *It is likely that all members of the family devote a fair proportion of time to preening, but some species live in habitats virtually devoid of fresh water, and thus must very rarely drink or bathe. Some of the Galapagos Islands, for instance, lack a permanent supply of fresh water, and the resident* Nesomimus *mockingbirds are presumably adapted to survive for long periods without access to this luxury.*

[Above: *Toxostoma longirostre sennetti*, Rio Grande Valley, Texas, USA. Photo: Tom Vezo.

Below: *Toxostoma rufum*, High Island, Texas, USA. Photo: Rob Curtis/ The Early Birder]



Most mimids are permanently territorial, pair-living, socially monogamous birds, but the situation is turned on its head in the Galapagos Islands, where three of the four species of Nesomimus *mockingbirds live in groups of up to ten individuals, all of whom co-operate to defend large territories and raise broods. Groups of* ***Espanola Mockingbirds****, for example, usually contain 7-10 adults, often comprising a single monogamous pair with helpers, and at other times containing two or more active pairs. As with all co-operative group-living species, sexual conflict is often intense, and social interactions are relatively complex.*

[*Nesomimus macdonaldi*, Española Island, Galapagos. Photo: Sam Fried/VIREO]

Since seasonal movements are limited to a minority of species living at higher latitudes and in more seasonal environments (see Movements), most mimids occupy and defend territories almost throughout the year. Such aspects of behaviour as song and visual displays are therefore prominent, and advertise the presence of the territory-holder and broadcast its residency to conspecifics and others, as well as to human observers. Furthermore, in many species, pair-members remain mated and jointly resident on territories for periods longer than a single breeding season, in some cases for many years. Conspicuous calls announce the whereabouts of one or the other partner within the territory, and as territories are often large, following from a combination of fairly large birds living in low vegetation, the calls and the songs are loud and far-carrying. Thus, even outside the breeding season, these mimids are usually quite vocal and readily identified.

On the whole, mockingbirds, thrashers and tremblers are vocal birds, often disclosing their whereabouts with a volley of calling, or a bout of song. In part because of the strength and quality of sound they produce, as well as the open landscapes they prefer, mimids are usually audible from long range. Further, many species are territorial all year round, and thus their songs are heard at all seasons, often becoming a signature for their respective habitats. The song of the ***Sage Thrasher****, an exuberant torrent of random notes and phrases, sometimes given for many minutes without pause, immediately evokes the sagebrush plains of North America.*

[*Oreoscoptes montanus*, Mono Lake, California, USA. Photo: Marie Read]

Territories are occupied in most instances by monogamously mated pairs, and, given the lack of sexual dimorphism in appearance and size (see Morphological Aspects), the sexes may yet be separable by differences in their behaviour. This, however, is not always the case, as the females of some species sing and actively join the males in territory defence, while the males assist in nest-building and in the feeding of the young. Thus, differences in gender roles may be poorly defined, as is so with, for example, the California Thrasher and several of its desert relatives. Exceptions to the rule of breeding territories being occupied and defended by breeding pairs, with young raised solely by the parents, occur most notably in the co-operatively breeding Galapagos mockingbirds *Nesomimus* and in some of the South American *Mimus* species (see Breeding).

Strong territoriality is the norm for Mimidae, and a considerable amount of information on territory choice, defence, size and function has accumulated. Territory sizes vary both with the size of the bird and with the vegetation, as is usual. In knee-high steppe vegetation of the Great Basin deserts, the Sage Thrasher occupies territories in the range of 0·4–1·7 ha, and territories of the Northern Mockingbird are similar in size. Three of the four Galapagos mockingbirds also have territories of about 1 ha on average, but those of the fourth species, the San Cristobal Mockingbird, are significantly larger, around 4 ha. Territory sizes of species such as the Brown Thrasher and the Grey Catbird, living in more mesic and productive habitat, are towards the low end of the mimid range, generally smaller than 1 ha, whereas those of the desert-dwelling thrashers are often much larger, extending to many hectares. California Thrasher territories in the chaparral of southern California cover approximately 2·5 ha, and those of the closely related and similarly sized Crissal Thrasher, which inhabits more arid scrub, are on average about twice this size.

The defence of territories is accomplished primarily by song, for the characteristics of which, such as range, quality, duration and "pyrotechnics", the family is justly famous (see Voice). Aerial





*The **Northern Mockingbird** is one of the most widely recognized and universally admired birds in Canada and the USA, a fact that derives in large part to its famously varied and uplifting song. As its scientific name suggests, this is one of nature's polyglots. The original "mockingbird", it learns the sounds produced by other species, as well as a whole range of artificial or mechanical noises, and mimics them faithfully in its own disjointed outpourings. Thus, by imitation, the repertoire of motifs and phrases that it amasses is so broad that it cannot be exhausted during a single bout of song, no matter how prolonged. Moreover, new sounds are learnt and old sounds discarded throughout the life of a territorial bird. This type of mimetic behaviour is widespread in the family, though by no means ubiquitous. More broadly, and with the conspicuous exception of parrots (Psittacidae), it is a skill confined to the oscine passerines, that large and varied group of families, the members of which possess the syringeal apparatus for producing complex notes, and the neural faculties for learning sounds.*

[*Mimus polyglottos*, Texas, USA. Photo: Tom Vezo]



The diet of mimids contains a wide variety of items, usually including a range of insects, seeds and fruits, such that they are best described as omnivores. The ***Tropical Mockingbird****, for example, eats a lot of insects and berries, but supplements this intake with larger fruits, such as ripe mangoes, as well as the eggs of birds and lizards, and whatever scraps it can find at feeders. There is virtually nothing on record about mimids eating flowers, but this individual is blatantly guzzling the petals of an ornamental bloom.*

[*Mimus gilvus tobagensis*, Tobago. Photo: Konrad Wothe]

displays may accompany song, and are particularly well developed in the *Mimus* mockingbirds. Individuals in full song will rise several metres above the perch in a leisurely and looping display-flight, singing continuously, before returning to the original perch or to another nearby. During these displays, the white wing and tail markings are shown to full advantage. The wings and tail of several *Mimus* species are mostly black or blackish in colour, and their white highlights are therefore all the more dramatic. In this genus, cocking, spreading or folding of the tail, both in flight and while perched, appear evocative of mood and intent, and reveal or conceal the lateral white flashes or terminal markings. Mockingbirds feeding on the ground will also engage in "wing-lifting", a type of behaviour that reveals the conspicuous wing markings and presumably signals the individual's presence and site-possession to other birds. Wing-flashing and tail-flashing are employed also in courtship displays, and wing-fluttering displays are well known for Sage Thrashers. The purpose of the "wing-trembling" that gives the Brown Trembler its name remains largely unknown, but it does appear to be far more frequent in social contexts than among solitary birds. It involves a perched individual repeatedly drooping its wings rapidly.

Such displays are presumably designed for conspecific receivers, but interspecific interactions with potential competitors are widely recorded. Some of these occur between confamilials, such as between the California Thrasher and the Northern Mockingbird in California, the Brown Thrasher and the Northern Mockingbird in eastern and central North America, and the Long-billed Thrasher and the Northern Mockingbird in Texas, while in the Mojave Desert Northern Mockingbirds are distinctly wary and silent around active Crissal Thrashers. In the Sonoran Desert, aggressive interactions between the Curve-billed Thrasher and the Cactus Wren (*Campylorhynchus brunneicapillus*) are commonplace, and may involve competition for both nesting and foraging sites. Many of the larger thrashers will routinely attack and displace other birds such as thrushes, shrikes (Laniidae) and large finches (Fringillidae), and show a general intolerance of other ground-foraging birds in close proximity to their foraging sites. Among those species that relocate seasonally, interspecific aggression extends also to the defence of winter territories. In South America, Chalk-browed and Tropical Mockingbirds are known to be interspecifically territorial, and Patagonian and White banded Mockingbirds show a significantly low co-occupancy of habitats that appear equally acceptable to both species.

Mimids in general have a well-deserved reputation for being noisy and aggressive, and their aggression extends beyond potential competitors and is directed also at potential nest predators (see Breeding).

Voice

Many species, certainly a majority, in the family Mimidae are generally accorded recognition as superlative singers. Somewhat whimsically, a dozen of them have gained entry to a list of "the world's most acclaimed avian songsters", even though, by other accounts, the more accomplished of the mimid species are omitted.

Throughout the family, the songs are loud and penetrating, the delivery is forceful and persistent, and the content is wonderfully varied both among and within species. Moreover, a single individual can have an extensive repertoire of individual notes and phrases, only a small portion of which may be revealed in any given song bout. Repertoire size and content are individually variable, in addition to which the content of any one Northern Mockingbird's repertoire is known to change continuously over time, as new components are added and others that were previously used are dropped. The Brown Thrasher, too, is an excellent example of this family's vocal talents. In studies of its "vocal virtuosity", the Brown Thrasher was found to have over 2000 song types.

Repertoire size is generally regarded as an index of fitness under sexual selection, and some evidence suggests that males with larger repertoires rank higher, secure better territories, and are more attractive to females. Many species are notable for their abilities to imitate the songs and calls of other bird species, and to incorporate these imitations into their own territorial song. In some cases, other noises are picked up by the vocalist and deployed to enhance its repertoire; these include, among others, dog barks, frog calls, bells, the postman's whistle, and even a





Fruit consumption is widespread amongst mockingbirds. It is perhaps especially prevalent in those species that live in the tropics, but the ***Northern Mockingbird****, a bird of temperate latitudes, is an avid frugivore nonetheless. Adults will leave their territories, sometimes flying high over those of their neighbours, to reach a fruiting tree, while juveniles, like the one pictured here, often harvest the late-summer berry crops. In both cases, small fruits are the usual target, but in the tropics the choice is broader. The lower photograph shows a* ***Chalk-browed Mockingbird*** *pecking, in thrush-like manner, at a ripe fruit far too wide to swallow whole. When even larger fruits, such as mangoes, papayas and bananas, are particularly ripe, or when their skins are opened by birds with hefty bills, the mimids take advantage of the feast.*

[Above: *Mimus polyglottos*, Ohio, USA.
Photo: S. & D. & K. Maslowski/FLPA.

Below: *Mimus saturninus*, Aquidauana, Mato Grosso, Brazil.
Photo: Edson Endrigo]

convincing imitation of the coyote's (*Canis latrans*) howl. The felicity of this vocal mimicry has received a good deal of attention and reportage. The name "mockingbird" is owed to these imitative abilities, but they are characteristic of mimids other than mockingbirds, being at least as well developed among thrashers and other members of the Mimidae.

Mimid songs are quite different from the short, discrete and relatively unvarying songs of many passerines, such as finches and parulid warblers, that are immediate and unequivocal signals of species identity. Mimid songs consist of a succession of phrases, each given once or, more usually, repeated several times. Successive phrases show a bewildering variety of forms, and follow each other rapidly, in a seamless or near-continuous string, or at a slower and more deliberate pace with measured pauses between them. The collection of phrases that comprises the song may continue for minutes on end without abating, and at the appropriate time of year and day a group of neighbouring thrashers or mockingbirds will almost completely dominate the airwaves for long periods of time. Rather unusually among songbirds, both males and females of several mimids are known to sing the typical song of the species; this has been recorded for the California and Le Conte's Thrashers and for Northern Mockingbirds.

Although the song, with its varied and unpredictable sequence of phrases and notes, is seemingly haphazard in its details, each species is nevertheless readily recognizable and distinguished by the attuned ear. In certain desert-edge sites in the south-western USA, where four or five mimids breed and sing within hearing distance of each other and the human listener, one has no problem in distinguishing one species from another, despite overall similarities in the song structures and even in some of their components. The pace of the song, its continuity or otherwise, and the nature of component phrases, whether mellow and flutier or harsher and more staccato, are the most obvious clues. The songs of locally co-existing thrushes in Europe, such as the Common Blackbird (*Turdus merula*), Song Thrush (*Turdus philomelos*) and Mistle Thrush (*Turdus viscivorus*), would be distinguished by similar interspecific differences in the quality and repetition of phrases. The spritely but rather harsh and colourless phraseology of the Northern Mockingbird's song would comprise one extreme, with the unbroken continuity of the sweeter and fast-paced Sage Thrasher song the other. In between, Crissal Thrasher phrases are slower, deeper and more deliberate, compared with which those of Le Conte's Thrasher are somewhat faster and less guttural, while Bendire's Thrasher sings flutier phrases with more continuity than the aforegoing two but, with distinct pauses, its song is slower and less interconnected than that of the Sage Thrasher. The fact that the songs of the desert thrashers are audible over many hundreds of metres is a great aid in locating and identifying these birds.

Early western naturalists vied with each other in their lyrical descriptions of the different thrasher and mockingbird songs, debated their comparative attributes, and varied in their advocacy of one or the other species as the superior vocalist. In North America, perhaps Bendire's Thrasher would win the ballot, and in South America the White-banded Mockingbird, by virtue of its superlative mimicry, would seem to be the front-runner. As the songs of all species are well represented on tapes and CDs, each listener can make his or her own judgement on their relative merits.

As many mimids are resident on their territories throughout the year (see General Habits), they correspondingly sing in all months. California, Le Conte's and Crissal Thrashers are examples of this. Nevertheless, these and other mimid species do exhibit seasonal peaks in singing activity, and also a relative cessation at other times, often during the post-breeding period. Although the California Thrasher can be heard singing throughout the year, it is rather quiet in late summer and early autumn. Singing becomes more than sporadic after the onset of winter rainfall in October and November, and builds in intensity throughout the winter months until nesting commences, in February. The Northern Mockingbird's song output is related to the stage of the breeding cycle over successive broods, reaching a peak during nest-building, slowing throughout the incubation and early nes-



As might be deduced by a comparison of their bills, the thrashers are more insectivorous than the mockingbirds. The proportion of plant material ingested is relatively small, usually around 10%, chiefly comprising small seeds found on or near the ground. Meanwhile, around 90% of food items are arthropods. These are usually captured while foraging on the ground under dense shrubs, and at this the thrashers excel. The long-billed species, such as ***Le Conte's Thrasher****, sweep their bills from side to side, vigorously displacing debris, digging small pits, and flicking fallen plant material aside. In this way they uncover hidden arthropods, including large numbers of beetles, grasshoppers, spiders and scorpions.*

[*Toxostoma lecontei lecontei*, Kern County, California, USA. Photo: Brian E. Small]



Out in the deserts of the south-western USA a few plants produce copious quantities of juicy nectar, investing much of their hard-earned supply of sugars and moisture to create an irresistible lure. Perhaps predictably, thrashers have developed a taste for the syrupy feast, and frequently ascend from their usual haunts to visit flowers. In the Sonoran Desert, the ***Curve-billed Thrasher*** *attends the flowering stalks of* Agave *plants, as well as the apical inflorescence of saguaros* (Carnegiea gigantea). *In all cases, the nectar is accessed directly, such that pale patches of pollen are daubed onto the forehead and chin, as can be seen in the accompanying photograph.*

[*Toxostoma curvirostre*, Pima County, Arizona, USA. Photo: Brian E. Small]

tling stages, then resuming as the nestlings grow and peaking again as another nest is built for the next clutch.

Vocal mimicry is widespread, although not ubiquitous, in the family. Usually it is the songs or calls of other birds, especially those of species that occur commonly in the mimic's territory, that are imitated and repeated in territorial songs. This propensity for mimicry provides for a popular ornithological diversion, that of identifying the number of calls or phrases in a mockingbird's song that are clearly derived from other birds. Occasionally, other natural sounds, including a wide variety of anthropogenic noises, are mimicked. In some species, such as the Chalk-browed Mockingbird, the song is said to be composed mostly of imitations of other birds. Other *Mimus* species, such as the Northern, Tropical, Chilean and Patagonian Mockingbirds, are accomplished mimics, and the White-banded Mockingbird is considered to be particularly outstanding in this respect. The Bahama Mockingbird, however, is not known to mimic other species. Among other *Mimus* derivatives on islands, the Socorro Mockingbird is a mimic but the Galapagos *Nesomimus* species are not. Mimicry is unknown also in some other mimids, such as the Long-billed and Crissal Thrashers, and it is occasional or weak in some of those species' close relatives, including the Brown and Le Conte's Thrashers, but well developed in others, as illustrated by the California Thrasher. The California Thrasher retains the songs of summer visitors to its habitat and mimics them in winter, long after the model has departed; it also imitates in the summertime the notes of departed wintering migrants. The same facility is reported for White-banded Mockingbirds in Argentina, which deliver in the breeding season songs learned on their northern non-breeding grounds. The Grey Catbird is a good mimic, but its Mexican relative and species in the Caribbean endemic genera apparently do not engage in vocal mimicry.

Besides their territorial songs, many mimids are equally distinguished, and distinguishable, by their calls. Loud and conspicuous calls presumably serve to maintain contact between paired individuals on territories within thick vegetation, and when the birds are not singing they can often be located by this calling behaviour. Variations on a basic call may signal sociable contact at one extreme and, at the other, high alarm. It is perhaps not inconsequential that, among related species with similar songs, the call notes are quite different. In one superspecies group that can serve as an example, the disyllabic low-intensity contact call of the California Thrasher, "churrit", becomes "pitchreee" in the Crissal Thrasher and "suweeep" in Le Conte's Thrasher, while these species' high-intensity and more monosyllabic alarm calls are correspondingly rendered as, respectively, "tschak", "choit" and "brrrrrt". The strident "chat" or "chert" calls of *Mimus* species are widely recognized, and the double "whit-whit" of the Curve-billed Thrasher, one of the pervasive sounds of the Sonoran Desert, is similarly diagnostic. Other mimids elsewhere have comparable and distinct calls.

Food and Feeding

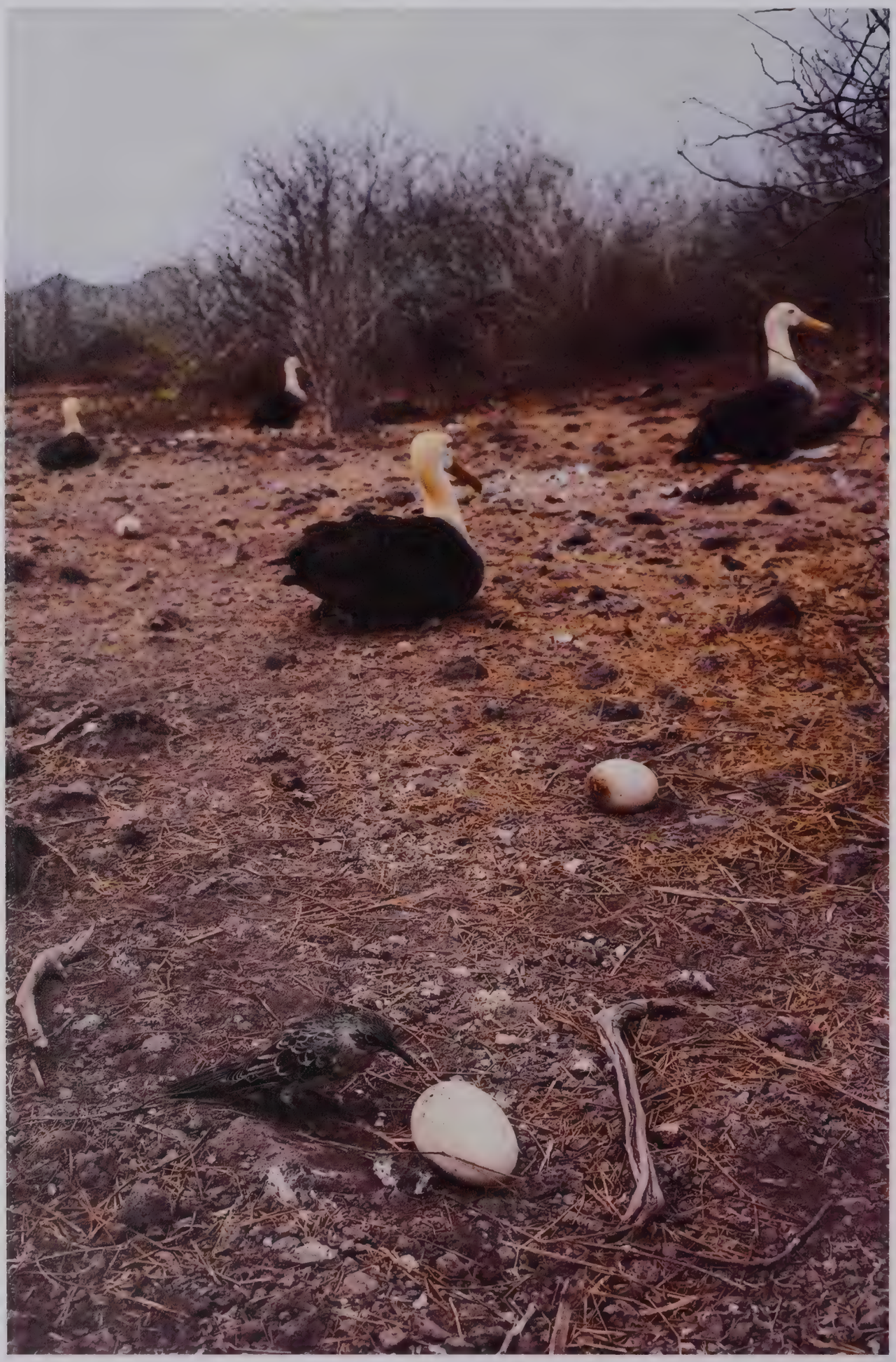
The mimids are most accurately described as omnivores, since they consume not only a variety of insect and other invertebrate prey but also many seeds and, especially, fruits. The diets of many North American members of the family are well studied, and there are extensive similarities among these. The degree of omnivory, measured as the ratio of animal matter to plant matter in the diet, varies interspecifically and intraspecifically. Thus, within a given species, it varies seasonally and also from one locality to another, as sites differ widely in terms of fruit availability. In general, the proportion of insects and other invertebrates in the diet is highest in the breeding season and lowest in the autumn and winter. The Grey Catbird, for example, consumes insects and plants in the ratio 4:1 while breeding, but the ratio is 1:4 in the autumn.

While foraging on the ground and searching in leaf litter beneath shrubs, many mimid species encounter and consume similar sorts of insects. Among the taxa well represented in their diets are, in approximate order of importance, beetles (Coleoptera), grasshoppers and crickets (Orthoptera), ants, bees and wasps (Hymenoptera) and lepidopteran larvae. The larger thrashers, such as the California and Brown Thrashers, probably take the largest invertebrates available in their habitats, and they handle with ease tough insects of 20 mm or more in length. Other invertebrates, such as spiders (Araneae), are also seasonally conspicuous in diets. Northern Mockingbirds and Brown Thrashers, in the more



In the North American deserts the fruits of a variety of cactus species, such as prickly-pears (Opuntia) *and saguaros* (Carnegiea gigantea), *provide a vital supply of nutrients and moisture for any creature capable of reaching them. Perched atop a towering spiny column, the saguaro fruit is only accessible to bats and birds, and thrashers figure prominently among the avian contingent. Both the California Thrasher* (Toxostoma redivivum) *and Bendire's Thrasher* (T. bendirei) *reap the benefits of desert fruits, as does the* ***Curve-billed Thrasher****, each of these species consuming both pulp and pips. Having played a role in pollinating cactus flowers, the thrashers now distribute the seeds, and thus their contribution to the life-cycle of these stately desert plants is quite significant.*

[*Toxostoma curvirostre celsum*, south-east Arizona, USA. Photo: Dave Maslowski/ Maslowski Productions]



Several members of the family are known to eat eggs opportunistically. Usually this involves robbing the clutches of passerines, sometimes even those of conspecifics, without any apparent systematic effort to locate active nests. Life on the Galapagos Islands, however, is a little different. The four species of Nesomimus *mockingbird live in a harsh environment, where water, fruit and insects are relatively scarce. In some cases this has given rise to extreme forms of opportunism, verging on vandalism. The mockingbirds have learnt to take advantage of serendipitous windfalls, such as that supplied by broken seabird eggs. In booby (Sulidae) colonies, egg breakages are relatively common due to the clumsiness of incubating adults, and their reckless altercations with neighbouring birds. It is possible that all* Nesomimus *species consume the contents of eggs broken in this way, but at least two, including the* ***Espanola Mockingbird****, have taken the next step: they break the egg themselves. Any egg, even that of the Waved Albatross* (Diomedea irrorata)*, can be cracked open by the sharp beaks of mockingbirds. At oceanic islands in general, and the Galapagos in particular, nesting seabirds are trusting and docile animals, allowing hungry mimids to invade their colonies with impunity.*

[*Nesomimus macdonaldi*, Punta Cevallos, Española Island, Galapagos. Photo: Tui de Roy/ The Roving Tortoise]

mesic habitats of the eastern USA, are known to dig up and eat worms, and in southern Texas the Long-billed Thrasher depends on a large helping of snails in its diet. Marine arthropods are routinely taken from the shorelines of the Galapagos islands by the *Nesomimus* mockingbirds living there. Other animal food taken includes small vertebrates such as lizards, frogs and snakes, which are probably seized in a purely opportunistic fashion, and for no species do they constitute a large component of the diet.

Several members of the family are known to eat the eggs of other bird species, even those of conspecifics, but this behaviour does not appear to be regular for any of them. By far the most bizarre feeding habits observed relate to the Galapagos Mockingbird, one individual of which was seen to steal food from a 20-cm centipede (Chilopoda) that was foraging for crickets in cracks in the lava; the mockingbird successively took two large crickets from the centipede and ate these. Even more startling is the blood-drinking behaviour of Galapagos Mockingbirds. Such behaviour was reported earlier from the islands and involved Sharp-beaked Ground-finches (*Geospiza difficilis*), but its occurrence among the mockingbirds was documented more recently. It is apparently not unusual there, as Espanola Mockingbirds were seen to drink blood from beached and wounded bull sea-lions (*Zalopus californianus*), and from placentas on sea-lion nursery beaches. This same mimid drinks blood from small wounds in the tails of marine iguanas (*Amblyrhynchus subcristatus*), perhaps a by-product of its practice of gleaning ticks (Acarina) from the skin of these large lizards. These mockingbirds are also egg predators, in addition to which they seize fish brought to booby (*Sula*) chicks by the parents, and even kill and eat the newly hatched boobies. More usually, and as with the ground-finch, mockingbirds drink blood from the neck and head wounds of Masked Booby (*Sula dactylatra*) chicks that have been attacked by neighbouring adult boobies in the nesting colonies. These mockingbirds were even interested in the blood running down scratched human legs. Such bold behaviour is apparently not without risk, as the presence of several dead mockingbirds in the booby colony attested.

Commonly, one third to one half of the diet of a wide variety of mimids consists of fruit or other plant material, and even higher percentages are typical in the non-breeding season. In Caribbean woodlands, the Scaly-breasted Thrasher is thought to be predominantly frugivorous, and fruit consumption is likely more prevalent among the mimids of tropical latitudes. Northern Mockingbirds, too, are avid frugivores, and will leave their territories, flying high over those of neighbours, in order to visit fruiting trees.

In general terms, small, soft berries are the usual fruit consumed, and, as an extremely wide range of plant species provides this element of the diet, there are few other generalities other than berry size. Nevertheless, a few items do recur in the diets of different mimids in several different habitats; these include elderberries (*Sambucus*), both wild and domestic grapes (*Vitis*), huckleberries (*Vaccinium*), figs (*Ficus*) and berries of poison oak and poison ivy (*Toxicodendron*). In the south-western USA, the succulent fruits of several cactus species are eaten, both for the pulp, a handy moisture source in the desert habitats, and for the seeds. Prickly-pears (*Opuntia*) and saguaro (*Carnegiea gigantea*) supply such foods, and the Curve-billed, Bendire's and California Thrashers are known to make use of them. Galapagos mockingbirds also depend heavily on cactus fruits. In the Sonoran Desert, the Curve-billed Thrasher often visits the flowering stalks of *Agave* plants, presumably making use of the copious supplies of nectar that they produce, and another source of water in an otherwise arid habitat. Dry fruits are also widely consumed by mockingbirds and thrashers, and their stomachs often contain various grains, some taken from birdfeeders and some from the field. Larger and tougher fruits are not ignored. Acorns are eaten by both California and Brown Thrashers, and the birds will lodge the item in a crevice on the ground while hammering away at the shell. Walnuts (*Juglans*) are handled in a similar way. Some mimids consume large, soft fruits, and regurgitate the large and inedible seeds.

When foraging for arthropods, rather than berries, mockingbirds and thrashers do the majority of their feeding on the ground, as is clearly indicated by their general morphology (see Morphological Aspects). Typically, the search for terrestrial arthropods is conducted in dense cover in the litter and accumulated plant material beneath shrubs. In this situation, the long-billed species employ a technique known as "bill-sweeping", in which the bill is flicked from side to side in order to displace the litter and uncover the food items. These birds rarely, if ever, use their feet and legs to scratch in litter but, rather, the bill is deployed to pick



Once an egg has been successfully broken, an ***Espanola Mockingbird*** *consumes the contents much as it would glean nectar from a flower. It inserts its bill into the aperture, and drinks the liquid yolk and albumen. The amount of nutritious food contained within a seabird egg is considerable, enough to provide a meal for an entire co-operative group of mockingbirds. Several birds often gather round the egg, taking turns to gorge themselves, the precedence of one individual over another governed by dominance hierarchies established within the group.*

[*Nesomimus macdonaldi*, Punta Cevallos, Española Island, Galapagos. Photo: Tui de Roy/ The Roving Tortoise]



The avifauna of the Galapagos Islands is depauperate, allowing the few successful colonists to expand their ecological niches. In this environment, species such as the ***Espanola Mockingbird*** *find themselves rather high up the food chain. A reduction in competition, and an increase in prey, has led them to adopt a more predatory lifestyle than their mainland counterparts. They routinely harvest marine arthropods, and capture lizards, frogs and snakes if the opportunity presents itself. It is possible that they kill turtle hatchlings from time to time, but the individual pictured here was probably attracted to carrion.*

[*Nesomimus macdonaldi*, Galapagos. Photo: Pete Oxford/ Nature Picture Library]

through the leaves and twigs, to probe and to expand the cracks and crannies, and often to dig small pits. These activities are often undertaken with considerable vigour, and a foraging thrasher, for example, will energetically displace rocks and fallen branches of a considerable size.

The catbirds, and their relatives and derivatives, are less terrestrial, and forage largely above the ground, gleaning insects from the vegetation. The most arboreal of the mimids seem to be the Caribbean tremblers and thrashers in the genera *Cinclocerthia* and *Margarops*, which are omnivores and search for insects in leaf clusters, vine tangles and epiphytes. The third endemic genus in these tropical woodlands, *Ramphocinclus*, is, however, largely terrestrial. It shares the Lesser Antillean islands of Martinique and St Lucia with four other mimid species, comprising three in the above-mentioned two genera and the Tropical Mockingbird. It is perhaps not surprising that some of the co-existing species have evolved arboreal foraging habits.

Breeding

Typical mimids are monogamous, territorial birds, this basic breeding system being common to the majority of temperate landbird species. Further, in most members of the family, the sexes



One of the more bizarre foraging adaptations in Nesomimus *species is "vampirism". This macabre habit seems to be restricted to the* ***Espanola Mockingbird****, which drinks blood from beached and wounded bull sea-lions* (Zalophus californianus)*, as well as from placentas on sea-lion nursery beaches. Opportunistic individuals are also regularly seen sipping at the head-wounds of nestling boobies (Sulidae), those perennial victims of neighbourhood hostility, and they even attempt to glean blood from humans whose calves have been scratched in the unforgiving scrubland.*

[*Nesomimus macdonaldi*, Española Island, Galapagos. Photo: D. Parer & E. Parer-Cook/Auscape]

seem to take a nearly equal role in the tasks associated with reproduction, including territorial defence, nest-building, incubation of the eggs and feeding of the young.

The breeding season is generally long, and often indicative of multiple broods. Several temperate-zone mimids are known for their early start to breeding, as early as late winter in some coastal species such as the California Thrasher, which then extends through the summer. Several of the mimids living in drier habitats initiate breeding after the onset of the rainy season, and species such as the Galapagos Mockingbird make use of high-rainfall "El Niño years" for greatly extended breeding opportunities. Some tropical members of the family, of which the Tropical Mockingbird is a good example, have been found breeding in virtually all months of the year.

Mimids have a variety of displays, many of these used throughout the year (see General Habits). It is worth mentioning here that wing-flashing and tail-flashing, in particular, are widely employed also in courtship displays.

For the most part, these are open-nest species, constructing a rough and large twiggy nest low down in dense vegetation. Desert thrashers customarily choose the spiniest of shrubs for their nests, which they often place in cacti. Nests are usually built by both members of the pair, although apparently only by females in the case of the Grey Catbird, and are variously lined with finer materials, such as grass and rootlets, fur, feathers, moss and other fibrous matter. As exceptions to the general rule, the Sage and Brown Thrashers occasionally nest on the ground, and the arboreal Caribbean tremblers construct a domed nest with a side entrance, often in a cavity or niche in a tree trunk. Also in the Caribbean, the Pearly-eyed Thrasher is commonly a cavity-nester, and on Mona Island, near Puerto Rico, it is known to nest in caves.

Clutch sizes of mimids are generally around 3–4 eggs at intermediate latitudes in the deserts, chaparral and other arid scrublands, but they follow the usual trend for higher clutch size at higher latitudes, both within and among species, and lower clutch size in the tropics. Breeding at the highest latitudes, the Sage Thrasher lays up to seven eggs and the Patagonian Mockingbird up to six eggs. Clutches of two eggs are typical of the Central American mockingbirds and the Black Catbird, and two or three eggs are the norm for the Caribbean endemics. The cooperatively breeding Galapagos mockingbirds, however, despite living at equatorial latitudes, lay four or five eggs per clutch. It is likely that strong seasonality on the Galapagos Islands, coupled with dramatic variation in conditions from one year to another, will select for higher clutch sizes.

The eggs of mockingbirds and their relatives are rather heavily blotched, those of the *Toxostoma* thrashers more lightly so, but the catbirds and their Caribbean derivatives have clear and unspotted blue to greenish-blue eggs. An interesting exception is the unspotted eggs of the Crissal Thrasher. This is apparently unrelated to exposure to brood parasites such as cowbirds (*Molothrus*), as both this and the related Le Conte's Thrasher reject cowbird eggs and, moreover, Le Conte's Thrasher's own eggs are spotted. Incubation, generally lasting for 12–14 days, is typically undertaken by both males and females, again with the exception of the Grey Catbird, in which only the female sits; the males of some mimid species develop a passable brood patch. Both parents feed the young.

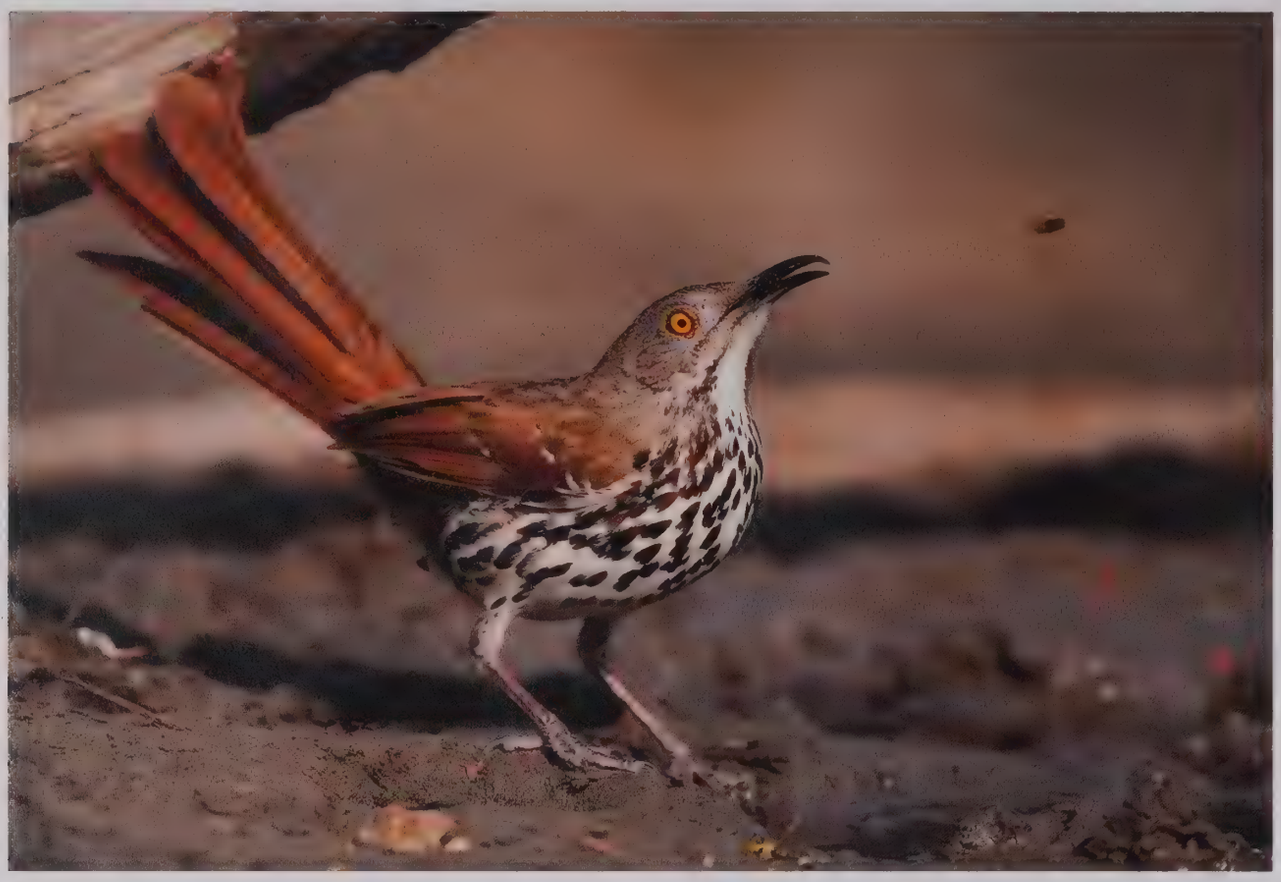
The number of broods raised per year varies among species. While a single brood is usual at higher latitudes, two or more are typical elsewhere. Following wet "El Niño years" in the Galapagos, up to eight broods are reared by the Galapagos mockingbirds in a breeding season that can last for up to eight months.

Nest predation is a major source of mortality for many mimid species, the open nests of which are vulnerable to a wide range of predators. Snakes, corvids, tree squirrels and ground squirrels figure prominently among these. For example, Brown Thrashers lose many nestlings to American Crows (*Corvus brachyrhynchos*), and California Thrashers lose many of theirs to Western Scrub-jays (*Aphelocoma californica*). On Socorro Island, the local subspecies of the Red-tailed Hawk (*Buteo jamaicensis*) is a major nest predator, as are introduced feral cats, and in mainland areas these and other mammals, such as foxes (*Vulpes*) and raccoons (*Procyon*), take a similar toll of the young birds. Thrashers, mockingbirds and catbirds will variously attack animals perceived as threats, including snakes, rats (*Rattus*), squirrels, dogs and cats, and not infrequently human beings. The California Thrasher is extremely pugnacious in defending its nest against the Western Scrub-jay, an inveterate nest-robber, and these encounters have been known to result in the death of the jay. Both Le Conte's and Curve-billed Thrashers are known to defend their nests vigorously against nest-robbing Greater Roadrunners (*Geococcyx californianus*). Such anti-predator behaviour is frequently accompanied by alarm calls, wing-raising and tail-flashing, which sometimes attract to the defenders' aid birds of other species, as in the mobbing of owls or hawks perched within a territory.



One of the most famous inhabitants of the Galapagos archipelago is the marine iguana (Amblyrhynchus subcristatus). *Mockingbirds on a variety of islands do these placid and pokerfaced lizards a considerable favour by gleaning the ticks (Acarina) with which they are often infested. Perhaps as a by-product of this activity, the* ***Galapagos Mockingbird*** *has learnt to pull sections of loose skin away from the body of basking iguanas. Judging by the amount of time it spends perched on these reptiles, lizard lice and sheets of lizard skin are its favourite snacks.*

[*Nesomimus parvulus*, Fernandina Island, Galapagos. Photo: Tui de Roy/ The Roving Tortoise]



*There is scarcely anything written about drinking in mimids, but it may be reasonable to predict that the highest rate of drinking will be in the insectivorous species of hot and relatively dry environments. The **Long-billed Thrasher** fits this bill quite neatly, and is seen here visiting a pool of water in the Rio Grande Valley of southern Texas. Like other passerines, drinking mimids dip their bills into standing water, then raise their heads to let the liquid trickle back down their throats. This portrait aptly captures the long, strong legs and ample tail of thrashers, classic adaptations to a cursorial lifestyle.*

[*Toxostoma longirostre sennetti*, Rio Grande Valley, Texas, USA. Photo: Tom Vezo]

Probably in response to the heavy level of nest predation, mimids have evolved the characteristic of rapid chick growth and early fledging. The young leave the nest generally after 12–14 days, many days before they can fly, and at well below adult weight. In some instances, they are no more than two-thirds the weight of the adults.

A marked divergence from the typical breeding system, in which young are raised by a mated pair working alone, is that in which the pair has "helpers at the nest". In such co-operative breeding systems, the young are fed also by conspecifics, these helpers often being the young of previous broods of the parents that they assist, although that is apparently not always the case. The adaptive advantages of helping to raise younger siblings are clearly a product of kin selection, but, when their genetic relatedness is more distant, the advantages to the helpers are less obvious. There are numerous examples of such systems, which recur predominantly in tropical latitudes, in low-productivity regions such as Australia, and among certain taxonomic groups, such as the Old World babblers and starlings and the New World jays (Corvidae), among many others. In the Mimidae, however, they are exceptional. Indications of co-operative breeding have been noticed in the case of several *Mimus* mockingbirds and, recently, the White-breasted Thrasher, but the behaviour has been most elaborately developed by the Galapagos *Nesomimus* mockingbirds, to which most studies relate. In those *Mimus* species for which helpers have been reported, they are apparently the exception rather than the rule. In one long-term study of Chalk-browed Mockingbirds in Argentina, helpers were seen to feed nestlings in two separate years, and, in the one case in which the parentage of the helper was known, it was assisting birds other than its own parents. There is suggestive evidence of helpers at the nests of Long-tailed Mockingbirds in Ecuador and of Tropical Mockingbirds in Venezuela. With the latter species, the young of previous broods remain in their parents' territory while subsequent broods are reared, and they may assist in the process.

The Galapagos mockingbirds are also strictly territorial, but in three of the four species the territory is occupied by social groups of up to ten or more individuals, rather than by pairs, that collectively defend fixed areas and participate in co-operative breeding. Studies have revealed that each group consists of a dominant male and female, which are generally monogamous, but on the larger group territories up to four breeding females are present. Usually each female lays eggs in her own nest, but sometimes eggs are jointly contributed to a single nest. The nestlings are fed by their parents and by helpers in the group, although not all members of the group assist in feeding the brood. Most helpers are adults, and males are significantly more likely than females to help at the nest; both sexes are more likely to assist if the brood's parents are also their own parents. Nevertheless, un-



*In most mimids studied to date both sexes contribute to nest construction, and this is the case in the **Sage Thrasher**. In common with* Toxostoma *species of semi-arid landscapes, breeding pairs build a bulky, cup-shaped structure of twigs, usually placing it out of reach in the thorniest location available. Unlike other mimids, they sometimes nest on the ground, but always well concealed under dense vegetation. The coarse outer structure is always lined inside with softer materials, such as grass, rootlets, feathers and moss. This individual is carrying what looks like animal fur precisely for this purpose.*

[*Oreoscoptes montanus*, Mono County, California, USA. Photo: John Gerlach/DRK]



The mockingbirds are typical of the family in building large, open-topped nests low down in dense vegetation. Compared to the tightly woven or firmly mud-moulded nests of thrushes (Turdidae), mockingbird nests tend to look hastily cobbled together. The structure is made up of chunky twigs, loosely assembled, and the lining is often rudimentary. One outcome of this open nest-design is that it renders mimids vulnerable to brood parasites. Indeed, the ***Chalk-browed Mockingbird*** *is one of the main hosts of the Shiny Cowbird* (Molothrus bonariensis)*, with up to 80% of its nests parasitized.*

[*Mimus saturninus frater*, Minas Gerais, Brazil. Photo: Anita Studer]

related helpers are not uncommon. Helpers have not been recorded at nests of the San Cristobal Mockingbird, the population density of which is much lower than that of mockingbirds on other islands, and the territories much larger and occupied by mated pairs only. Elsewhere, larger groups occupy larger territories, and nests with three helpers produce more than twice as many young as do nests with no helpers.

Movements

A large majority of the Mimidae are residents. They either are sedentary, remaining on fixed territories throughout the year, or engage in very local post-breeding movements as new recruits are incorporated into the population and territories subsequently re-established.

In North America, four species have breeding distributions that reach north to Canada. Two of these, the Northern Mockingbird and the Grey Catbird, range from the Pacific coast east to the Atlantic seaboard, while the Brown Thrasher breeds in the eastern and central states and the Sage Thrasher in the west. The first-mentioned is largely sedentary, although some individuals that breed at higher latitudes may shift to different territories in winter or partially vacate the northern extremities of the breeding range. It does, however, retain a presence at its northern outposts throughout the winter months. The Brown Thrasher is a summer visitor to the northern two-thirds of its breeding range, a year-round resident in the south-eastern states of the USA, and a winter visitor to central Texas, south-west of and beyond the breeding range. It also occurs as an occasional winter vagrant farther west, from New Mexico to California, and southwards in states in the northern third of Mexico, as well as in the Caribbean from the Bahamas south to Cuba.

The remaining two northern species migrate to winter ranges wholly or largely separate from the breeding ranges. The Sage Thrasher moves south from the Great Basin Desert to spend the winter months in the more southerly Mojave, Sonoran and Chihuahuan Deserts, while the Grey Catbird vacates all of its broad range except for strictly coastal areas of the USA from Massachusetts south to Florida. Grey Catbirds winter around the Gulf of Mexico and in Central America south to Panama, as well as on islands in the Greater Antilles; they have been recorded as vagrants in Colombia. This species, which has the longest migration of any mimid, appears to display "leapfrog" migration: individuals in the extreme south-west of the wintering range, in Panama, had been ringed in the extreme north-east of the breeding range, in Nova Scotia. Grey Catbirds in Altimira, in Panama, exhibited site-fidelity over several successive winters.

One other North American mimid is a partial migrant. Bendire's Thrasher lives in desert-scrub habitats from south-eastern California, southern Nevada, Utah and Colorado south to southern Sonora, in Mexico. It leaves the northern half of this range after breeding, and the northern birds apparently join southern conspecific residents to spend the non-breeding season in the region from southern Arizona and southern New Mexico southwards to the extreme of the breeding range.

A similar picture of seasonal movements is found among the Neotropical members of the genus *Mimus*. The two species with more southerly ranges east of the Andes, the Patagonian and White-banded Mockingbirds, spend the non-breeding season to the north and partially outside their breeding ranges. The former occupies much of northern Argentina in the austral winter, while the latter moves over longer distances from its central Argentine breeding range to encompass much of Bolivia, Paraguay, Uruguay and parts of southern Brazil. The extent to which the breeding ranges of these two species remain occupied in the winter period is uncertain, but it appears that many individuals remain at or near local breeding sites.

Several members of the family have been recorded as vagrants on the eastern side of the Atlantic Ocean. Not surprisingly, these involve the three migratory species with breeding ranges that include the eastern parts of North America. The Grey Catbird has reached Europe on at least five occasions, the most recent in October 2001, when an individual was found on Anglesey, off north Wales; in addition, one was discovered on Tenerife, in the Canary Islands, in November 1999. Northern Mockingbirds have crossed the Atlantic three or four times, and there are two European records of the Brown Thrasher.

In this connection, there are a number of instances of mimids landing on ocean-going vessels while at sea. One of the most





Breeding in mimids is an egalitarian enterprise. In most species both sexes share the tasks in equal measure at all stages of the nesting cycle, and thus males invest roughly the same amount of effort in territorial defence, nest-building, incubation of eggs and feeding of young as do females. This is certainly the case in the ***Brown Thrasher****, the simultaneous arrival of this pair to feed a brood providing a fitting symbol of their close collaboration. The allocation of duties in the* ***Curve-billed Thrasher*** *is slightly less democratic, with females contributing rather more than males in terms of incubation and provisioning. The upper image shows a thrasher nest placed on the ground, a rare sight in most* Toxostoma *species, while the lower image shows one cradled deep in the unwelcoming arms of a cholla cactus* (Opuntia)*, a much more typical placement. By making use of the plant's defensive armoury, Curve-billed Thrashers, and other desert-dwelling mimids, virtually assure their brood of a safe passage through the incubation and nestling phases. In both these species the young are fed a diet of insects, with a small amount of fruit, and take anything between 11 and 16 days to leave the nest.*

[Above: *Toxostoma rufum*, Presque Isle County, Michigan, USA. Photo: John Gerlach/DRK.

Below: *Toxostoma curvirostre*, Green Valley, Arizona, USA. Photo: Tom Vezo]



*As if to accentuate the thrush-like impression it conveys, this **Grey Catbird** is carrying an earthworm (Oligochaeta) to its brood. This particular prey item is rare in the diet of most mimids, chiefly because they live in drier habitats where worms are scarce, or difficult to dig for. This generalization does not apply to the Grey Catbird, which tends to nest in damp undergrowth, as this photograph attests. This species is also unusual for a mimid in that the male contributes little to nest construction, and never, or rarely, incubates. He does feed the nestlings, however, which helps them to develop quickly: they fledge after about 12 days.*

[*Dumetella carolinensis*, Sirdar, British Columbia, Canada. Photo: S. Roberts/Ardea]

interesting cases concerned a Grey Catbird that, in October 1998, joined a Europe-bound cruise liner sailing from New York. When the ship called in at the port of Southampton, on the south coast of England, the catbird remained on board, having presumably learnt to enjoy an easy life on the handouts provided by the passengers and crew.

Relationship with Man

A number of mimids have a rather close relationship with humans, to the extent that they find acceptable living conditions in suburban gardens, city parks and plazas, and in the disturbed, open vegetation associated with habitat clearance and agriculture. Several North American members of the family are among the perhaps half-dozen bird species familiar to the more observant urban dweller. Indeed, the Northern Mockingbird must be one of the most widely recognized birds in the USA, especially with its propensity for nocturnal singing, and it is the "official bird" of no fewer than five states; the Brown Thrasher serves in that capacity for the state of Georgia. This contact with the bulk of the populace, together with an appreciation of these birds' conspicuous and often quirky behaviour, renders them akin to suburban icons. Tropical Mockingbirds extend this familiarity through the lower latitudes, while the various South American *Mimus* species are equally effective ambassadors, between their taxa and ours, from Brazil and Ecuador south through most of Chile and Argentina.

A few of the species are locally regarded as mild pests for their habit of feeding on agricultural grains and on orchard fruit and nut crops. In the Caribbean, for example, the omnivorous Pearly-eyed Thrasher is sometimes considered a very unwelcome visitor, as it consumes commercial crop fruits such as papaya and bananas. Generally, however, mimids are not persecuted to an excessive degree by humans.

In the early part of the twentieth century, some Northern Mockingbird populations were decimated by the cagebird trade in a bid to satisfy customers eager to possess these talented songsters. Fortunately, however, these negative effects were short-lived. Indeed, it was the release by disgruntled shippers of caged birds destined for domestic markets that enabled Tropical Mockingbirds to colonize Panama in the 1930s; this species was thereby able to fill in a natural hiatus in its range, between Costa Rica and Colombia. The colonists have thrived, and are still expanding their range in that country. Members of this family are still kept as cagebirds throughout Central and South America, but trapping for this purpose is not thought to be having any significant effect on their wild populations.

It is perhaps of interest to add here an anecdote, relating to the describer of the genus *Dumetella*, as an example of ornithological detection. S. L. Olson's detailed investigation of this matter, published in 1989, is summarized below.



*Intensive provisioning by both parents, accelerated growth of chicks, and truncated fledging periods are features common to most mimids. A young **Bendire's Thrasher** spends roughly 12 days in the nest, an incredibly brief period for a bird of its size. In effect, thrasher chicks leave the nest prematurely, when they are only two-thirds of adult weight, and many days before they can fly. This unusual strategy has probably arisen in response to high rates of predation. Flightless fledglings are vulnerable, but at least they are scattered in dense undergrowth, raising the likelihood that some individuals will survive to adulthood.*

[*Toxostoma bendirei*, Mexico. Photo: Patricio Robles Gil]



Ever since Darwin's day, Galapagos wildlife has been famous for its fearlessness. The endemic Nesomimus *radiation is no exception, as illustrated by this cameo of the* ***Espanola Mockingbird*** *in its natural habitat. The energetic curiosity of these birds sets them apart from most local fauna, and endears them to many visitors. In reality, their fascination with human beings stems from the discovery that most large reptiles and mammals, not least the modern-day tourist, are a reliable source of tasty treats.*

[*Nesomimus macdonaldi*, Española Island, Galapagos. Photo: Andy & Gill Swash]

The "Cat Bird" referred to by M. Catesby in the first half of the eighteenth century served as the type of Linnaeus's "*Muscicapa carolinensis*". Over a century later, when the species was first placed in its own monotypic genus, separate from *Mimus*, it was given the name *Galeoscoptes*, proposed by J. Cabanis in 1850. For several decades thereafter, the Grey Catbird was widely referred to under the name *Galeoscoptes carolinensis*. In the early years of the twentieth century, however, C. W. Richmond advised that a certain "S.D.W." had applied the name *Dumetella* to this species in a journal entitled *The Analyst*, and in 1907 W. Stone proposed that this generic name be substituted for *Galeoscoptes*. Three years later, the American Ornithologists' Union, in the third edition of its *Check-list of North American Birds*, adopted this suggestion, since when the Grey Catbird has borne the scientific name of *Dumetella carolinensis*. It seems, however, that nobody had ever attempted to identify the full name of "S.D.W.", the original author of the new generic name.

The Analyst was a London-based English publication, described as a "journal of science, literature, natural history, and the fine arts". It survived for only a short period, from 1834 to 1840. Many of its contributors gave only their initials or pseudonyms, or pseudonymous initials, as was the general practice in those days. The original description of the genus *Dumetella* appears in the preamble to an 1837 article entitled "The fishes (Pisces) of Britain, systematically arranged"; previous issues of the journal contain similar lists of British birds and mammals, and several discourses on ornithological nomenclature, by the same author. "S.D.W." appears as a vigorous proponent of a highly idiosyncratic system of nomenclature and orthography. One of his basic beliefs was that the genus should be reflected not only in the scientific name of an organism but also in its English name, a proposal that had already been advanced by N. Wood in the same journal, and he made extensive arbitrary changes to both. In 1908, Richmond listed all the proposed new generic names of birds, and attributed them all to "S.D.W.". About 20 years earlier, at least one of S.D.W.'s names, "*Densirostra*", was listed in an index of avian genera by F. H. Waterhouse, who gave the author's name as "Wood". This provides the first clue to the identity of "S.D.W.". Neville Wood was the fourth son of Charles Thorold Wood, both of whom published books on ornithology in the years 1835–1836. C. T. Wood, in *The Ornithological Guide*, repeated one of S.D.W.'s papers in *The Analyst* almost in its entirety, stating that it accorded with his own views of nomenclature, and N. Wood, in *The Ornithologist's Text Book*, was extremely favourable in his reviews of some of S.D.W.'s contributions. Both express a very high opinion of *The Analyst* as a journal. From the character and tone of their writing, and from the inference in Waterhouse's 1889 index, there is no doubt that S.D.W. is either C. T. Wood or his son.

From the circumstantial evidence, the former is immediately the more likely. His son, Neville, put his own name to his contributions in *The Analyst* and, furthermore, referred to articles by "S.D.W." in such a way as to indicate that they were penned by somebody other than himself. Moreover, C. T. Wood, writing in *Magazine of Natural History*, stated that he had "altered the name" of a species listed in two articles in *The Analyst* that are signed "S.D.W.". Further corroboration that "S.D.W." is a pseudonym of C. T. Wood is found in his son's book *British Song Birds*. In this, the names of several birds are attributed directly to C. T. Wood, in each case with the reference cited as either "*Analyst* 13" or "*Analyst* 14"; in these issues of the journal, the names in question appear only in the lists signed "S.D.W". It is quite clear from this evidence, there-



Although it occupies a restricted range entirely within the borders of Chile, the ***Chilean Mockingbird*** *is common, and its long-term future appears to be secure. It occupies a wide range of semi-arid habitats from sea-level to 2000 m, but reaches peak abundance in maquis or matorral-type habitat on the lower slopes of coastal ranges. Elsewhere it occurs, but at lesser densities, in semi-desert, succulent coastal scrub, and disturbed habitats such as successional vegetation in the vicinity of settlements. Most of these habitats seem very unlikely to be at risk within the foreseeable future.*

[*Mimus thenca*, Yelo-Dam, Región 5, Chile. Photo: Johannes Ferdinand]



*The total global population of the **Espanola Mockingbird** currently stands at 1000-2500 individuals, all of which reside on the Galapagos island of Española, and the tiny adjacent islet of Gardner. Because its range is permanently limited, and because its numbers could at any point be smashed by a single disaster, natural or otherwise, this species is listed as Vulnerable. For the moment, however, it appears to be thriving in the arid littoral scrub and thorny woodland of its island home. The most crucial conservation measure is to ensure that Española remains free of introduced mammalian predators, especially rats.*

[*Nesomimus macdonaldi*, Española Island, Galapagos. Photo: Josep del Hoyo/ Lynx Edicions]

fore, that the identity of S.D.W., the describer of the genus *Dumetella*, is C. T. Wood.

Status and Conservation

As the majority of mimid species live in arid and scrubby vegetation unsuitable for intensive agriculture, and others thrive in disturbed areas at the edges of woodland or in even closer proximity to man and his activities, these birds have, by and large, escaped the wholesale and often devastating negative effects of habitat clearance and fragmentation. In *Threatened Birds of the World*, published in 2000, BirdLife International nevertheless listed five of the 34 species in the family as globally threatened and one as Near-threatened.

Among the North American mainland species, the Crissal, Le Conte's and Bendire's Thrashers, three desert-dwelling mimids, are designated as "species of special concern" by the State of California. This perhaps signifies that these thrashers, with their naturally rather discontinuous ranges, may be sensitive to disturbances such as off-road vehicle traffic, habitat degradation, and sprawl around desert urban centres. Similarly, a fourth species, the Sage Thrasher, is of concern in the State of Washington, where its preferred sagebrush habitat has been reduced by one third to three-quarters of its pre-settlement levels in some regions of the state. Its status at the extreme northern edge of its range, in British Columbia, is more precarious. Here, only a few hundred hectares of suitable terrain remain in the several southern valleys of the province that provide breeding habitat, and the species is under consideration for "Endangered" status.

While the Black Catbird is reasonably common in some parts of its range in the Yucatán Peninsula, it is often regarded as rare and local. Over much of the upper portion of the peninsula it is uncommon to rare, and possibly only seasonal in its occurrence. It is similarly rare in the south of its range, in north Guatemala. In the core area of its distribution on the eastern side of the peninsula, including Cozumel Island and the Belize cays, much habitat loss and fragmentation has resulted from tourism-related developments and the conversion of scrubby woodland and forest to coconut plantations. In Belize, the Siwa Ban Reserve was established in 1998, with the express purpose of protecting the Black Catbird population on Caye Caulker. Whether this initiative has been effective is, however, uncertain. Because of the continuing loss of habitat to which this species is subjected, it is currently placed in the conservation category of Near-threatened.

In a family that shows extraordinary capabilities for colonizing islands, it is not surprising that the major conservation challenges are found among several of its island populations. Perhaps the one at greatest risk of extinction is the Cozumel Thrasher, confined to the island of that name off the north-east coast of the Yucatán Peninsula. This species was reasonably common until, in September 1988, a major hurricane hit the island. This clearly had a massive effect on the species' numbers, for this thrasher suddenly became very rare; indeed, only three individuals were found during the ensuing seven years, all mist-netted during the course of survey work. In 1995, the island was lashed by another big hurricane, after which, and despite annual surveys, the thrasher was not seen again and was feared by some to be extinct. It was a great surprise, therefore, when a single Cozumel Thrasher was discovered in June 2004, the first for almost nine years. Although it has been assumed that the two hurricanes were

*The **White-breasted Thrasher** is restricted taxonomically to a monospecific genus, and geographically to two Lesser Antillean islands. Once common, its population crashed in the twentieth century, and now comprises some 150 pairs, 40 on Martinique and the rest on St Lucia. These last pairs suffer the usual litany of threats to island fauna: habitat loss; introduced predators; and alien competitors. Given its precarious situation, it is classified as Endangered.*

[*Ramphocinclus brachyurus sanctaeluciae*, Anse la Sourciere, St Lucia. Photo: Doug Wechsler/ VIREO]





By far the rarest species of Nesomimus, *the* ***Floreana Mockingbird****, is now extinct on Floreana itself, perhaps as a result of nest predation by introduced rats. It survives on two tiny satellite islets, one of 0·8 km² and the other just 0·1 km². Its combined population lies in the region of 150–250 individuals. With so few individuals surviving in such a minute range, this species is vulnerable to an array of critical factors, including meteorological fluctuation, accidental mammalian introductions, inbreeding and disease. It is listed as Endangered.*

[*Nesomimus trifasciatus*, Campeón Island, Galapagos. Photo: Tui de Roy/ The Roving Tortoise]

responsible for the demise of this mimid, it is worth pointing out that Cozumel, because of its geographical location, must have suffered from these devastating meteorological events at relatively frequent intervals over an extremely long period of time prior to 1988. One would have expected the thrasher to have become adapted to this situation and to have evolved the means of surviving the huge damage wrought by such events. This species is currently listed as Critical, but it should be borne in mind that, not many decades ago, as many as 10,000 Cozumel Thrashers lived on the 480-km² island. Although this mimid was earlier reported to inhabit scrubby woodland and dense undergrowth, and the edges of tropical forest, the three individuals found in 1994 and 1995 were well away from scrub, two in deciduous forest and the third in semi-deciduous forest. A thorough investigation of its ecology may help to provide some further explanation for its exceedingly rapid decline.

A second species resident on a Mexican island is also classed as Critical. This is the Socorro Mockingbird, the sole representative of its genus, which is restricted to a single island of 132 km² in the Revillagigedo Archipelago, some 600 km off Mexico's north-western coast. At least one endemic landbird, the Socorro Dove (*Zenaida graysoni*), and possibly a second, the local subspecies of the Elf Owl (*Micrathene whitneyi*), are already extinct there. The total population of the Socorro Mockingbird numbered about 350 individuals in 1994, a drastic decline from the levels found a half-century earlier. Three primary causes are suggested as being responsible for this: predation by feral cats, habitat alteration caused by sheep grazing, and competition from a new colonist, the Northern Mockingbird, which arrived on Socorro between 1971 and 1978. Various studies have revealed little evidence that predation is a serious problem, and the Northern Mockingbird is thought unlikely to be an important competitor, as it is smaller than the Socorro Mockingbird and differs from it ecologically. The most probable reason for the latter's decline is intensive grazing by sheep, which has already destroyed a great deal of the species' habitat. A conservation programme aimed at removing both sheep and cats from the island has already started.

Similar concerns surround the status of the White-breasted Thrasher, another species in a monotypic genus. This globally threatened Caribbean mimid has a narrow range, restricted to the two Lesser Antillean islands of Martinique and St Lucia, where it was formerly common and widely distributed. By the middle of the twentieth century, however, it was thought to have become extinct, but subsequent fieldwork revealed that the thrasher was still present, although in greatly reduced numbers. Its current population is thought to total approximately 150 pairs. The nominate race, on Martinique, consists of 40 or more pairs, while the St Lucia population, *sanctaeluciae*, estimated at 46 pairs in 1992, was believed to number about 120 pairs in a survey carried out three years later. More recently, a global population of no more than 250 individuals has been suggested. The decline in this species was brought about initially by habitat clearance, subsequently accelerated by predation by rats and mongooses (*Herpestes*) and further degradation of low woodland and scrub-forest. Although Martinique and St Lucia are comparatively large islands, with respective surface areas of 1080 km² and 600 km², the White-breasted Thrasher is found in just two areas totalling little more



The ***Soccoro Mockingbird****, sole representative of the genus* Mimodes, *lives on a single island in the Revillagigedo Archipelago, some 600 km off Mexico's north-western coast. By 1994, its population had declined to around 350 individuals, probably as a result of predation by feral cats and overgrazing by introduced sheep. The rate and scale of decline suggests that this species is in a precarious situation, and thus it is listed as Critical. A programme aimed at removing both sheep and cats from the island (now a biosphere reserve) has begun.*

[*Mimodes graysoni*, Monte Evermann, Socorro Island, Mexico. Photo: Juan Cornejo]



Another island endemic listed as Critical, the ***Cozumel Thrasher****, is perhaps the mimid closest to extinction. Its population numbered around 10,000 birds until, in 1988, a hurricane hit the Mexican island of Cozumel. This wreaked havoc with native habitat, and the thrasher almost vanished. Only three were found in the next seven years, and none at all after 1995, when a second storm devastated the island. It was rumoured to be extinct, and news of another sighting, in June 2004, was greeted with surprise and relief. As it happens, this enigmatic mimid is possibly safer than history suggests, as large areas of habitat remain very poorly surveyed.*

[*Toxostoma guttatum*, Mexico. Photo: John S. Dunning/ VIREO]

than about 20 km². Its nests, eggs and juveniles are preyed on by mongooses, rats and snakes, and also by Pearly-eyed Thrashers. On St Lucia, competition from the the Spectacled Thrush (*Turdus nudigenis*), a recent colonist, is an additional factor cited as responsible for the decline. The White-breasted Thrasher is "officially" placed in the conservation category of Endangered, but it is hoped that efforts to control its predators will lead to some recovery in its numbers. A conservation initiative has been started on St Lucia, with the aim of determining the species' true population size, its precise distribution and ecological requirements, and the impact of predation and human disturbance on its breeding success. Of particular interest is the fact that this species has recently been found to breed co-operatively.

The remaining two globally threatened species are found in the Galapagos Islands. The Floreana Mockingbird was once common on the large island of that name, previously known as Charles Island, and it was observed there by Charles Darwin in 1835, but it had disappeared some 50 years later. It now survives on two small satellite islets off Floreana, where its combined population is probably of the order of 150–250 individuals. The species is listed as Endangered. Introduced black rats (*Rattus rattus*) have been implicated in this mimid's extinction on the main island; whereas other islands of the Galapagos had, or have, native rats, Floreana had no rats whatever until the introduction of this nest predator to a naive mockingbird population. The survival of the two extant populations is not assured, either. Some scientists are concerned that, in the absence of immigration from Floreana itself, the birds on these tiny islets, one of which is 0·8 km² in size and the other just 0·1 km², may have already lost a significant amount of genetic diversity, rendering them more vulnerable to fatal diseases. Furthermore, this species is greatly influenced by weather events, extreme conditions causing substantial fluctuations in its numbers.

Although listed as globally threatened, and placed in the conservation category of Vulnerable, the Espanola Mockingbird appears to be still common. It inhabits arid littoral scrub, low thorny mesquite (*Prosopis*) scrub and scrubby woodland with scattered trees. Its current population, estimated to be between 1000 and 2500 individuals, lives on Española, formerly called Hood Island, and on one tiny adjacent islet. There is no evidence that either has been populated by rats. The primary conservation concern over this species stems from the fact that it is confined to two small islands on which its population trends are not known. It seems quite possible that extreme weather events in the Galapagos could have effects on this species similar to those known to be suffered by the Floreana Mockingbird. In addition, any accidental introduction of alien predators to Española or Gardner-near-Española would almost certainly have major adverse consequences for these islands' only mimid inhabitants.

Several other island mimid populations give cause for concern or, in some cases, are beyond recovery. For example, the Pearly-eyed Thrasher is known to have disappeared from the small Venezuelan island of Horquilla, at the southern edge of its extensive east Caribbean range southwards from the Bahamas, although it persists not far away to the west, on Bonaire. Its congener, the Scaly-breasted Thrasher, is thought to be lost from several islands that it previously occupied within its more limited Lesser Antillean range.

While the extinction of any unique island taxon is irreparable, and rightly perceived as a conservation failure with moral overtones, a biogeographical view of the colonization and extinction dynamics of island populations regards both components as inexorable parts of the evolutionary process. The term "taxon cycle" was coined by E. O. Wilson to describe, originally in respect of Melanesian ants, the cycle of broad-ranging and generalized species that colonize depauperate islands, evolve there through stages of increasing taxonomic distinction from their ancestors, and eventually succumb to extinction as the pressure of newly arriving colonists drives the cycle. Thus, the loss of island endemics is inevitable over the longer term; average lifespans in the Lesser Antillean avifauna are estimated at about 2 million years. Notwithstanding this, in virtually every historical instance of island extinction witnessed over the last century or so, human actions, both direct and indirect, have clearly accelerated the taxon cycle and pushed older, endemic species closer to the brink.

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PLATE 45

inches 4
cm 10

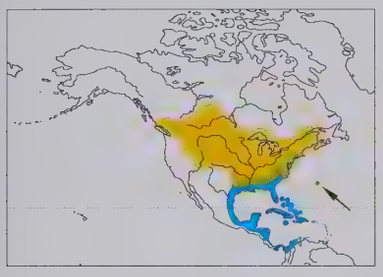
Genus *DUMETELLA* C. T. Wood, 1837

1. **Grey Catbird**

Dumetella carolinensis

French: Moqueur chat **German**: Katzenvogel **Spanish**: Pájaro-gato Gris
Other common names: Common/Northern Catbird

Taxonomy. [*Muscicapa*] *carolinensis* Linnaeus, 1766, Virginia, USA.
Closely related to *Melanoptila glabrirostris*, and these two species are sometimes considered closely enough related to be lumped in the same genus; in such an arrangement, present genus has priority. In past, present species was commonly isolated in genus *Galeoscoptes*, but *Dumetella* subsequently shown to be the older name (see page 474). Proposed races *ruficrissa* (W parts of range), *meridiana* (C & S) and *bermudiana* (Bermuda) appear to be too weakly defined to be reliably distinguishable. Monotypic.
Distribution. Breeds S Canada (British Columbia E to Nova Scotia) and C, E & SE USA (E Washington and E Oregon SE to Utah and Texas, E to Atlantic coast, also on Bermuda; non-breeding extreme S & SE USA, N Caribbean islands, and Atlantic coastal areas of Central America S to Panama and Colombia.



Descriptive notes. 21–24 cm; 23–56 g. This and related *Melanoptila* are the smallest mimids; has wings short and rounded, tail rather long. Plumage is uniform dark grey, with black forehead, crown and tail; under-tail-coverts chestnut (usually not conspicuous); iris dark brown; bill black, legs dull fleshy brown to dusky or blackish-brown. Sexes alike. Juvenile is brownish-grey, mottled below, iris grey. VOICE. Long series of varied, deliberate repeated phrases, variously harsh, squeaky, or more musical and mellow, typically with less repetition than other mimids; male and female known to duet. Typical calls distinctive, including harsh and rapid "chek-chek-chek", soft and low-pitched "whirt", and cat-like mewing; mimics other bird species to varying degrees, also mechanical sounds and frog calls.
Habitat. Inhabits dense shrubbery and second growth, hedgerows and windbreaks, and well-vegetated residential areas; uncommon in forest and in conifers. Utilizes low, often successional habitats during migration. Winters in similar edge habitat and scrub in tropical zones, generally below 1000 m.
Food and Feeding. Generalized omnivore, feeds on insects and fruits; predominantly frugivorous in late summer, on migration, and in wintering sites in tropics. Known to destroy eggs of other species. Nestling diet almost exclusively small insects. Gleans insects from foliage, usually within 2–3 m of ground, occasionally higher; often feeds on ground, where searches for insects by flicking aside litter with the bill. Sexes defend separate territories in winter.
Breeding. Season varies with latitude; egg-laying begins late Apr in SE USA, Jun in S Canada; two broods typical, possibly three in SE of range. Nest, built mostly by female, a bulky open cup made of grasses, bark, small twigs and rootlets, lined with finer material, placed typically 1–2 m above ground in dense cover of shrub; strongly territorial around nest, territory c. 0·2–0·4 ha, sometimes excludes other species, including nest-parasitic Brown-headed Cowbird (*Molothrus ater*), from territory. Clutch 3–4 eggs, occasionally up to 6, clutch size larger towards NW extremity of range, smaller in later part of season, eggs unspotted turquoise-green; incubation by female, period 12–15 days, mostly 13 days; chicks fed by both parents, nestling period up to 12 days.
Movements. Migratory. Winters in SE USA, N Mexico, on islands in Caribbean and along Caribbean coast of Central America as far S as Colombia. Present in C part of breeding range early May to late Aug; non-breeders in Central America early Oct to mid-Apr. Site-fidelity in successive years noted on both breeding and wintering territories. Vagrants recorded in Venezuela, also in E Atlantic (Tenerife, in Canary Is) and several times in Europe.
Status and Conservation. Not globally threatened. Common throughout most of breeding range; sporadic at edge of range, e.g. NE Wyoming (EC USA). Mid-term variation in population density apparent, e.g. overall 3–5% decrease in SE USA during 1966–1991, but increased density in same area 1966–1979, and strong declines (1–10%) 1982–1991. Probably benefits from forest clearance, planting, shelterbelts, and other human activities that have modified pre-settlement landscapes in North America. As non-breeding migrants in Caribbean and Central America use largely scrub and second-growth habitats, likely not so sensitive to habitat clearance in those areas as are other Neotropical migrants.
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Genus *MELANOPTILA* P. L. Sclater, 1858

2. **Black Catbird**

Melanoptila glabrirostris

French: Moqueur noir **German**: Glanzkatzenvogel **Spanish**: Pájaro-gato Negro

Taxonomy. *M[elanoptila] glabrirostris* P. L. Sclater, 1858, Omoa, Honduras.
Sometimes placed in genus *Dumetella*, to which present species certainly appears to be closely related. Separation of populations on Cozumel I (off NE Yucatán Peninsula) as race *cozumelana* appears unwarranted. Monotypic.
Distribution. Yucatán Peninsula S to S Campeche (Mexico), N Guatemala and N Belize, including Cozumel I and other nearby Caribbean reefs.



Descriptive notes. 19–20·5 cm; 31·6–42 g, average 36·3 g. This and *Dumetella* are the smallest mimids; has wings short and rounded, tail somewhat long. Plumage is uniform glossy blue-black; iris dark reddish; bill and legs black. Sexes alike, female slightly less heavy than male. Juvenile is brownish-grey, mottled below, iris grey. VOICE. Repeated phrases of harsh, scratchy to warbled, fluty notes. Call notes a nasal "chrrh", harsh "rriah", and grating "tcheeu;" not known to mimic other species.
Habitat. Scrub, deciduous thorn-scrub, woodland edges and low deciduous woodland with dense shrub understorey; on Yucatán Peninsula, drops out to S when woodland becomes taller, more open beneath canopy. Abundant in thickets and low woodland edge on Cozumel I. Habitat generally similar to that occupied by *Dumetella carolinensis* in SE USA. At low elevations.
Food and Feeding. No detailed studies. Forages low down; gleans insects in dense, shrubby vegetation. Superficially similar to *Dumetella carolinensis* in foraging habits.
Breeding. Nest building starts in early May, in Belize; small young in nest in mid-Aug, at Cancún. Nest an open cup of twigs, lined with finer material, placed low in dense shrub. Clutch 2 eggs, uniform greenish-blue. No other information.
Movements. Largely resident; may move S seasonally from drier N parts of Yucatán Peninsula in late summer to early winter.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Relatively common in some parts of mainland range, but often regarded as rare and local; common on Cozumel I; common to uncommon on other offshore reefs in Mexico and Belize. Uncommon to rare over much of upper Yucatán Peninsula; rare in Petén area of N Guatemala. Not recorded in Honduras since the type specimen was collected there, at Omoa, in 1850s; was apparently rare at Omoa when first discovered. In E parts of range, has suffered much loss and fragmentation of habitat through tourism-related developments and the conversion of scrubby woodland and forest to coconut plantations. In Belize, the Siwa-Ban Reserve was established in 1998, with the express purpose of protecting the population on Caye Caulker; it is uncertain whether this initiative has been effective. Continuing loss of habitat gives cause for concern over this species' prospects.
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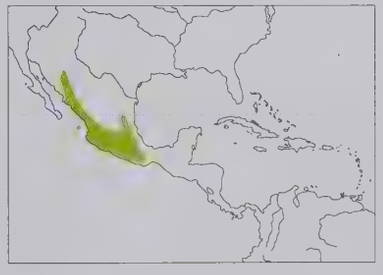
Genus *MELANOTIS* Bonaparte, 1850

3. **Blue Mockingbird**

Melanotis caerulescens

French: Moqueur bleu **German**: Blauspottdrossel **Spanish**: Mulato Azul

Taxonomy. *Orpheus caerulescens* Swainson, 1827, Mexico.
Probably forms a superspecies with *M. hypoleucus*; was in the past sometimes considered conspecific, but this view based on aberrant specimens of race *longirostris*. Proposed race *effuticus* (from W Mexico) generally regarded as indistinguishable from nominate. Two subspecies recognized.
Subspecies and Distribution.
M. c. caerulescens (Swainson, 1827) – W, E & S Mexico (Sonora and SE Chihuahua S to Oaxaca, and SW Tamaulipas S to Puebla and W Veracruz).
M. c. longirostris Nelson, 1898 – Tres Marías Is, off W Mexico.



Descriptive notes. 24–26·5 cm; 50–69 g. Medium-sized mimid with short, rounded wings and long tail. Plumage is overall deep blue, streaked paler blue on crown, throat and chest; contrasting black mask from bill back to ear-coverts; iris red; bill and legs black. Differs from *M. hypoleucus* in having blue, not white, underparts. Sexes alike, female slightly smaller. Juvenile overall dull grey, bluish tints in wings and tail, iris dull. Race *longirostris* is somewhat paler than nominate by dint of few silvery-edged feathers, also wing and tail shorter, bill longer. VOICE. Unmistakable song, usually from dense cover, an extended string

On following pages: 4. Blue-and-white Mockingbird (*Melanotis hypoleucus*); 5. Brown Trembler (*Cinclocerthia ruficauda*); 6. Grey Trembler (*Cinclocerthia gutturalis*); 7. White-breasted Thrasher (*Ramphocinclus brachyurus*); 8. Pearly-eyed Thrasher (*Margarops fuscatus*); 9. Scaly-breasted Thrasher (*Margarops fuscus*).

of repeated phrases of richly varied notes, mellow to harsh and guttural; distinct from that of other mimids in its slow, deliberate note repetition. Calls varied, including harsh, mewing "meearrh", loud, mellow "cheeoo" notes, and many others.
Habitat. Brushy riparian areas in arid Pacific-coast lowlands; tall, variously dense thorn-scrub, low tropical deciduous woodland and forest edge, especially in SW of range; edge and thick understorey of taller oak (*Quercus*) woodland, humid pine–oak–fir (*Pinus–Quercus–Abies*) forest in highlands. Common in heavy forest on Tres Marías Is (race *longirostris*). Generally to 3000 m in highlands, but to coastal plain, and foothills (Oaxaca); down to sea-level on Pacific slope in Nayarit.
Food and Feeding. Omnivorous, though probably largely insectivorous in breeding season. Feeds low in vegetation or on ground; forages energetically in leaf litter, flipping aside leaves with the bill.
Breeding. Apr–Jul on mainland and Jun–Aug on Tres Marías Is; no information on number of broods per season. Nest an open cup of coarse, loose twigs, lined with rootlets and other fine material, placed 1–2·5 m above ground in dense shrub or leafy tree. Clutch 2 eggs, unspotted deep turquoise-blue. No other information.
Movements. Resident; no routine seasonal movements documented, although vagrants recorded in SW USA, several hundred km outside known breeding range.
Status and Conservation. Not globally threatened. Common to fairly common. Routinely encountered in preferred habitat from Sonora S to Oaxaca; common in Nayarit, Jalisco and Colima. Race *longirostris* common in forest on Tres Marías Is, but has become more restricted there with logging of forest, and with habitat degradation following browsing by introduced deer and goats.
Bibliography. Anon. (1998b), Binford (1989), Brewer (2001), Corcuera & Butterfield (1999), Forcey (2002), González-García *et al.* (2004), Hellmayr (1934), Howell & Webb (1995), Hunn *et al.* (2001), Kaufman (1996a), van Rossem (1945), Rowley (1966, 1984), Schaldach (1963), Selander & Giller (1959), Stager (1957), Stotz *et al.* (1996).

4. **Blue-and-white Mockingbird**

Melanotis hypoleucus

French: Moqueur bleu et blanc **German**: Lasurspottdrossel **Spanish**: Mulato Pechiblanco

Taxonomy. *Melanotis hypoleucus* Hartlaub, 1852, Guatemala.
Probably forms a superspecies with *M. caerulescens*; was in the past sometimes considered conspecific, but this view based on aberrant specimens of race *longirostris* of latter. Monotypic.
Distribution. SE Mexico (Chiapas) E to Honduras and N El Salvador.



Descriptive notes. 24–28 cm; 60–64 g. Medium-sized mimid with short, rounded wings and long tail. Plumage is deep blue with silvery sheen above, streaked paler blue on crown; contrasting black mask from bill back to ear-coverts; entirely white below, except for dark blue-grey flanks and vent; iris red; bill and legs black. Sexes similar, female slightly smaller than male. Juvenile is overall dark grey, bluish on wings and tail, bill light grey, iris dull, underparts mottled; moult to first-year plumage completed by end of Aug. Voice. Striking and distinctive song, given intensely Mar–May, a string of repeated phrases of richly varied, often alternately high and low, notes, and trills, similar to that of *M. caerulescens*. Calls are many and various, including loud, mellow "cheeoo" notes as well as abrupt, harsher scolding, clucking or growling calls, e.g. "ahrrr-took-took-took-took". Sometimes imitates other species.
Habitat. Humid highlands to semi-arid vegetation at lower elevations. Thorny scrub and second growth, low scrubby woodland, and forest edge, thick undergrowth in pine–oak (*Pinus–Quercus*) woodland. At 900–3000 m; mainly 2000–2500 m in NE Guatemala, mainly 1000–2000 m in Mexico (Chiapas).
Food and Feeding. Largely insectivorous; also small fruits, within and outside breeding season. Forages chiefly on ground, also low in vegetation; secretive, shy, wary of intruders. Feeds in ground litter; rarely uses feet, displaces fallen leaves by making side swipes with bill. Adults and immatures may consort in loose groups or be found singly outside breeding season.
Breeding. Breeds late Apr to mid-Jul at higher elevations, and May–Sept at lower elevations in Guatemala; incubation from mid-May. Territorial. Nest, built by female, a shallow cup lined with rootlets, supported by platform of coarse, long twigs, placed 1–4·5 m above ground in dense shrubbery. Clutch 2–3 eggs, the larger number reported at lower elevations, eggs unspotted glossy light blue; incubation by female alone, period unknown; chicks fed by both parents, nestling period 14–15 days.
Movements. Resident.
Status and Conservation. Not globally threatened. Restricted-range species: present in the North Central American Highlands EBA. Common in interior and highlands of Chiapas (S Mexico) and Guatemala. No known threats. May benefit from forest clearance and degradation, which create wider availability of edge and brush habitats.
Bibliography. Álvarez del Toro (1954), Anon. (1998b), Brewer (2001), Dickey & van Rossem (1938), González-García (1993), Hellmayr (1934), Howell & Webb (1995), Komar (2002), Komar & Domínguez (2001), Komar & Thurber (2003), Land (1970), Monroe (1968), Salvin & Godwin (1879), Skutch (1950), Stotz *et al.* (1996).

Genus *CINCLOCERTHIA* G. R. Gray, 1840

5. **Brown Trembler**

Cinclocerthia ruficauda

French: Trembleur brun **German**: Braunzitterdrossel **Spanish**: Cocobino Pardo

Taxonomy. *Stenorhynchus ruficauda* Gould, 1836, locality unknown = Dominica.
Genus may be most closely related to *Margarops*; contrary to earlier opinion, appears not to be close to *Ramphocinclus*. Probably forms a superspecies with *C. gutturalis*, and previously considered conspecific. Race *tremula* possibly merits treatment as a separate species; proposed races *pavida* (St Kitts) and *sola* (Montserrat) considered indistinguishable from that race. Three subspecies recognized.
Subspecies and Distribution.
C. r. tremula (Lafresnaye, 1843) – N Lesser Antilles (Saba, Barbuda, St Kitts, Nevis, Montserrat, Guadeloupe).
C. r. ruficauda (Gould, 1836) – Dominica, in C Lesser Antilles.
C. r. tenebrosa Ridgway, 1904 – St Vincent and Grenada, in S Lesser Antilles.



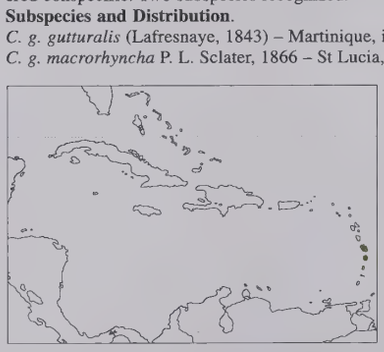
Descriptive notes. 23–26 cm; 43–71 g. Large forest mimid with very long, slightly downcurved bill, relatively short tail often cocked over back; wings often drooped and jerkily shaken. Nominate race is rufous-brown above, more reddish-brown towards rump and on tail and wings; throat pale greyish-buff, becoming greyish-brown on chest; lower underparts buffy brown; iris yellow; bill black; legs brownish-black. Distinguished from *C. gutturalis* by more rufous coloration above, darker underparts. Sexes similar, female somewhat smaller than male but with noticeably longer bill. Juvenile has faint dusky-grey spotting on chest. Race *tremula* is like nominate but longer-billed and c. 10% larger, also sexual dimorphism more marked (female weighs up to 20% less than male, but has exposed culmen up to 20% longer); *tenebrosa* is intermediate in overall size, darker above, chest more strongly and extensively suffused greyish, and shows less sexual dimorphism in bill length (9% longer in female) and weight (male on average 3% heavier). Voice. Full song, from mid-Mar, a series of loud and varied notes and phrases, harsh to melodious, at measured intervals of c. 2 seconds; also a quiet "subsong" 5 seconds long, and a rapid and jumbled "excitement" song during territorial disputes. Rasping "yeeak" call.
Habitat. Humid forest (from rainforest to montane forest), occasionally plantations, on most islands within range. On Dominica, rather more common in windward evergreen forest in lowlands and in rainforest than in leeward dry forest in lowlands and montane thickets, but generally distributed throughout island.
Food and Feeding. Diet includes variety of large arthropods, among them scorpions (Scorpiones), spiders (Araneae) and various insects, e.g. beetles (Coleoptera), cockroaches (Blattodea) and orthopterans; also seed, pulp and capsules of various fruits. Small vertebrates (such as tree-frogs) and snails also taken. Smaller fruits, e.g. melastomes, swallowed whole and undigestible parts regurgitated. Chiefly arboreal in foraging habitats (unlike most mimids); forages throughout vegetation, up to forest canopy (c. 40 m above ground). Searches vegetation tangles, especially epiphytes such as bromeliads orchids and ferns, also trunks, branches, crotches and hollows of trees, for invertebrate prey; long bill presumably an adaptation for epiphyte-searching. Also seen to forage terrestrially; hops between foraging spots, pecks and probes at leaf litter and into ground.
Breeding. Breeds Mar–Apr. Thoughht to be a territorial breeder; loose groups of up to six individuals consort in single tree before breeding season. Nest an open cup of small twigs and roots, lined with fibre material and dead leaves, placed in tree cavity, hollow in tree-fern, palm, or crotch of tree, also reported as domed with side entrance; nestbox sometimes used. Clutch 2–3 eggs, greenish-blue and unspotted; no information on incubation and fledging periods, nor on roles of sexes.
Movements. Generally sedentary. Occasional records of vagrants on several of Virgin Is (e.g. St Eustacius, St Thomas) and Antigua, near N edge of Lesser Antilles.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Lesser Antilles EBA. Status varies among the different islands, ranging from common to rare; this variation may be a function of competition with other mimids, or availability of its preferred wet-forest habitats.
Bibliography. Anon. (1998b), Arendt *et al.* (2004), Bond (1985), Brewer (2001), Diamond (1973), Faaborg (1985), Hellmayr (1934), Hunt *et al.* (2001), Keith (1997), Lack (1976), Markowsky *et al.* (1994), Raffaele *et al.* (1998, 2003), Ricklefs & Bermingham (1997), Steadman *et al.* (1980), Storer (1989), Stotz *et al.* (1996), Zusi (1969).

6. **Grey Trembler**

Cinclocerthia gutturalis

French: Trembleur gris **German**: Grauzitterdrossel **Spanish**: Cocobino Gris

Taxonomy. *R[amphocinclus] gutturalis* Lafresnaye, 1843, Martinique, Lesser Antilles.
Genus may be most closely related to *Margarops*; contrary to earlier opinion, appears not to be close to *Ramphocinclus*. Probably forms a superspecies with *C. ruficauda*, and previously considered conspecific. Two subspecies recognized.
Subspecies and Distribution.
C. g. gutturalis (Lafresnaye, 1843) – Martinique, in C Lesser Antilles.
C. g. macrorhyncha P. L. Sclater, 1866 – St Lucia, in SC Lesser Antilles



Descriptive notes. 23–26 cm; 65–76·2 g. Large forest mimid with very long, slightly downcurved bill, relatively short tail often cocked over back; wings often drooped, and tail jerkily shaken. Nominate race is warm grey-brown above, lores and ear-coverts darker, wings more dusky-coloured; dull to buffy white on throat and median portions of breast and abdomen; sides of breast, flanks and thighs plain brownish-grey to greyish-brown, flanks more markedly brown or olivaceous; undertail-coverts greyish-brown more or less margined with whitish; iris pale yellow; bill blackish; legs dark. Differs from *C. ruficauda* mainly in greyer, less rufous, coloration, paler underparts. Sexes alike in plumage, but female c. 3% smaller than male in most linear dimensions but with bill 18% longer. Juvenile is browner, with mottled chest. Race *macrorhyncha* has underparts dull buffy whitish to pale greyish-buff, undertail-coverts and flanks pale cinnamon to wood-brown, sides tinged olive-greyish, female bill averages 16% longer than male's. Voice. Repeated notes and phrases, harsh to melodic, quavering whistles; distinct from voice of *C. ruficauda*.

Habitat. Mature wet forest, less so in drier scrub and open woodland, mostly on leeward sides of islands. Less restricted to rainforest habitats than is *C. ruficauda*. Some evidence for segregation of tremblers into wetter, more closed forest habitats than drier, more open vegetation typical of *Ramphocinclus brachyurus*.
Food and Feeding. No detailed studies of diet; various invertebrates, especially insects, also fruits in season. Mainly arboreal, but feeds at all heights in vegetation, and also on ground. Long bill used to tear open vegetation tangles, and to probe into epiphyte clusters. Foraging habitats apparently like those of *C. ruficauda*.
Breeding. Breeds Mar–Apr. Nest apparently domed, of grassy materials, placed in palm, or in crotch or hollow of tree. Clutch 2–3 eggs, unspotted greenish-blue. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Lesser Antilles EBA. Fairly common throughout Martinique and St Lucia. Occurs at all elevations in wide variety of habitats. Some qualitative evidence that race *macrorhyncha* is more restricted to rainforest habitats on St Lucia than it was a century ago, this possibly related to presence of *Ramphocinclus brachyurus* in lower, drier habitat. No threats to populations known, other than those implicit in its very restricted geographical range.
Bibliography. Anon. (1998b), Arendt *et al.* (2004), Benito-Espinal & Hautcastel (1988), Bond (1985), Brewer (2001), Danforth (1935), Diamond (1973), Faaborg (1985), Hellmayr (1934), Hunt *et al.* (2001), Keith (1997), King (1978/79), Lack (1976), Markowsky *et al.* (1994), Raffaele *et al.* (1998, 2003), Ricklefs & Bermingham (1997), Steadman *et al.* (1980), Storer (1989), Zusi (1969).

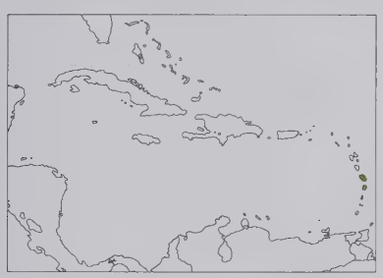
Genus *RAMPHOCINCLUS* Lafresnaye, 1843

7. White-breasted Thrasher

Ramphocinclus brachyurus

French: Moqueur gorge-blanche **Spanish**: Cuitlacoche Pechiblanco
German: Weißbrust-Spottdrossel

Taxonomy. *Turdus brachyurus* Vieillot, 1818, Martinique, Lesser Antilles.
Was in the past sometimes placed in genus *Cinclocerthia*, but the two genera may not be closely related. Race *sanctaeluciae* considered a separate species by some authors. Two subspecies recognized.
Subspecies and Distribution.
R. b. brachyurus (Vieillot, 1818) – Martinique, in C Lesser Antilles.
R. b. sanctaeluciae (Cory, 1887) – St Lucia, in SC Lesser Antilles.



Descriptive notes. 20–23 cm; nominate averages 48·2 g, *sanctaeluciae* 59·9 g. Medium-sized mimid of distinctive appearance, with rather long, slightly decurved bill; droops and flicks wings. Nominate plumage is dark brown above, faint white supercilium, whitish scalloping on head, lores to ear-coverts blackish, greyish-white edging on scapulars; throat and underparts plain white, vent brown; iris red; bill blackish; legs dark. Sexes alike in plumage, female very slightly smaller in all linear dimensions, including bill. Juvenile is brown below, becoming white-breasted with age. Race *sanctaeluciae* is darker and more uniform, c. 10% larger in linear dimensions than nominate, sexual size dimorphism also greater, male c. 3% larger than female (sexes of nominate nearly equal in size). Voice. Repeated short, mellow and varied phrases, each of several syllables. Call notes, on Martinique "chek-chek-chek", on St Lucia "tschhhhhhh".
Habitat. Dry woodland, coastal thickets, wooded stream valleys, scrub-forest on windward coast at lower elevations, with little or no ground cover but abundant leaf litter. Present in transitional zone between dry coastal woodland and interior rainforest, but absent from true rainforest; may be excluded by *Cinclocerthia gutturalis*.
Food and Feeding. Terrestrial arthropods; also small fruits, berries; small vertebrates, such as lizards (*Gymnopthalmus pleei*, *Anolis luciae*) and frogs (*Eleuthrodactylus johnstonei*), sometimes taken. Forages mainly on ground, searching leaf litter for prey; also ascends to several metres in vegetation. Relatively longer legs and shorter bill than *Cinclocerthia*, thus more adapted to terrestrial foraging than to arboreal probing.
Breeding. Breeds Apr–Aug. Co-operative breeding recently discovered on both St Lucia and Martinique; on St Lucia, roughly a third of nests have helpers, which are mainly or exclusively retained offspring. Nest a rough, bulky cup of twigs and leaves, lined with grass and rootlets; on Martinique, placed 2–8 m above ground, on St Lucia 0·5–3 m (averages 1·5 m), in shrub or sapling. Clutch 2 eggs, unmarked greenish-blue; incubation 14 days; nestling period 12 days; fledged young dependent on parents, spend most of their time on ground. Two or more successful broods may be raised in a year. Nesting success on St Lucia 44% in 1997, 29% in 2001, and 38% in 2002–2004; predators of nests and juveniles include mongooses (*Herpestes*), opossums (*Didelphis*), rats (*Rattus*), snakes and *Margarops fuscatus*.
Movements. Sedentary.
Status and Conservation. ENDANGERED. Restricted-range species: present in the Lesser Antilles EBA. Current global population thought to total c. 1300–2600 breeding adults, of which 200–400 on Martinique (nominate race) and 1100–2200 on St Lucia (*sanctaeluciae*) in 2004; latter population estimated at only 46 pairs in early 1990s, but since then a major new site for the species has been discovered further S on E coast of St Lucia. Although Martinique and St Lucia are large islands (1080 km² and 600 km², respectively), this species is found in only two narrowly confined areas, the Caravelle Peninsula (519 ha) on Martinique and a limited stretch of E coast of St Lucia, totalling little more than c. 20 km². Was common and widespread in 19th century; by first half of 20th century was believed extinct, but subsequent fieldwork revealed that it was still present, in greatly reduced numbers. The most important factor responsible for its decline is habitat loss; other possible factors include predation of nests, eggs and juveniles by mongooses, opossums rats and snakes, as well as by *Margarops fuscatus*, and perhaps competition from a recent colonist, the Spectacled Thrush (*Turdus nudigenis*). On St Lucia, a tourist resort currently under development threatens up to 23% of the overall population. There are no protected areas for the species on St Lucia; on Martinique, most of the remaining habitat is protected, either within the Caravelle Nature Reserve or under other forms of designation.
Bibliography. Anon. (1998b, 2005), Anthony (2001), Babbs *et al.* (1988), Benito-Espinal & Hautcastel (1988), Bond (1957, 1985), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Danforth (1935), Diamond (1973), Faaborg (1985), Hellmayr (1934), Hunt *et al.* (2001), Ijsselstein (1992), John (1995), Keith (1997), King (1978/79), Lack (1976), Raffaele *et al.* (1998, 2003), Revel *et al.* (1996), Ricklefs & Bermingham (1997), Stattersfield & Capper (2000), Storer (1989), Stotz *et al.* (1996), Temple (2005), Zusi (1969).

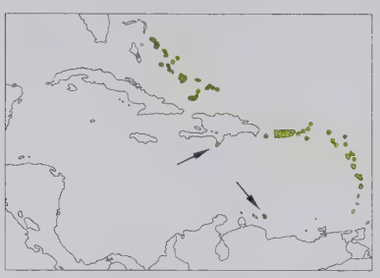
Genus *MARGAROPS* P. L. Sclater, 1859

8. Pearly-eyed Thrasher

Margarops fuscatus

French: Moqueur corossol **German**: Perlaugen-Spottdrossel **Spanish**: Cuitlacoche Chucho

Taxonomy. *Turdus fuscatus* Vieillot, 1808, Puerto Rico.
Four subspecies recognized.
Subspecies and Distribution.
M. f. fuscatus (Vieillot, 1808) – Bahamas (S from Eleuthera I), Turks and Caicos Is, Beata I (off S Hispaniola), Mona I, Puerto Rico, Virgin Is and N Lesser Antilles (Antigua).
M. f. densirostris (Vieillot, 1818) – Lesser Antilles (Montserrat and Guadeloupe S to Martinique).
M. f. klinikowskii Garrido & Remsen, 1996 – St Lucia, in SC Lesser Antilles.
M. f. bonairensis Phelps, Sr & Phelps, Jr, 1948 – Bonaire I, in Netherlands Antilles.



Descriptive notes. 28–30 cm; 75–142 g, average 102·6 g. The largest mimid, with streaky-brown appearance, robust bill; noisy and conspicuous. Nominate race has crown and upperparts brown with darker feather centres, sides of head and face mottled darker, uppertail-coverts with small whitish centres and tips; wings and tail blackish-brown, outer webs of secondaries edges rufous, tertials tipped whitish, outer rectrices with broad whitish tips; throat and underparts whitish, streaked brown, belly less marked; iris pale grey-white; bill yellowish; legs brown to pinkish or greyish-flesh. Distinguished from *M. fuscus* by larger size, longer and yellow bill, somewhat paler coloration, especially on wings and tail, less scaly-looking breast, no wingbar. Sexes similar in appearance, female generally somewhat larger and heavier than male. Juvenile resembles adult. Race *densirostris* is larger than nominate, darker above and more broadly streaked below; *klinikowskii* is largest race, has breast markings more contrastingly dark brown and white, more extensive white tips on wings and tail; *bonairensis* is more greyish-olive than brownish. Voice. Song, often from elevated perch, heard day and night, a slow series of whistled phrases, 1–3 syllables, lengthy pauses between segments, rambling; harsh, raucous call notes, e.g. "craw-craw", "chook-chook".
Habitat. Dense scrub and thickets, woodland and forest, including palm groves and mangroves; also disturbed and agricultural settings, and settlements, including urban and suburban areas. In Puerto Rico, density increases with size of habitat patch. Occurs at all elevations; commoner above 250 m in wetter forest on Dominica.
Food and Feeding. Omnivorous; feeds on variety of arthropods, berries and fruits, also vertebrates. Volumetric analysis indicates that plant food constitutes two-thirds of diet, with remainder divided equally between insects and vertebrates. Many types of fruits taken, including *Cecropia*, *Agave* nectar, and crop fruits such as papaya and bananas. Preys on eggs and nestlings of many other birds, including pigeons and doves (Columbidae), parrots (Psittacidae) and other mimids, and even adult birds taken; also eats lizards, tree-frogs, land crabs. Large items sometimes cached and later retrieved. Often forages in groups. Largely an arboreal forager, mainly at middle levels up to canopy, to 5 m, mostly above 1·5 m; infrequently terrestrial.
Breeding. Extended season when considered overall, Dec–Sept; timing varies over islands, e.g. breeds Jun in Bahamas (San Salvador); multiple broods. Aggressively territorial; will kill birds and destroy nests of potential competitors, e.g. Red-legged Thrush (*Turdus plumbeus*), and will also pirate nest materials. Nest is a bulky construction of twigs and dry grass, often placed in a tree cavity or nestbox, occasionally as open cup in tree or shrub; sites also include buildings, porches, and (Mona I) caves. Clutch 2–3 eggs (reports of 4–6 require confirmation), 27 clutches reported from Mona I were all of 2 eggs; egg colour glossy deep blue-green; hatching asynchronous, incubation period 14–15 days; nestling period 19–21 days. Nestlings susceptible to botfly (*Philornis*) parasitism.
Movements. Resident; some wandering indicated by records of vagrants in Jamaica and Barbados, well outside breeding range.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Bahamas EBA, Hispaniola EBA, Puerto Rico and the Virgin Islands EBA and Lesser Antilles EBA. Generally common on most islands within range; often especially abundant on smaller islets, e.g. Mona and other islets around Puerto Rico, St John (Virgin Is), St Eustacius (N Lesser Antilles). Uncommon on Martinique. Has recently extended N in Bahamas. S Caribbean race *bonairensis*, confined to Bonaire I, was earlier found also farther E, on La Horquilla I (in Hermanos Group, off N Venezuela), but now extinct there (last reported in 1908). Range discontinuous; conspicuously absent from Cuba, Jamaica and mainland Hispaniola, although present on Beata I (off S coast of Hispaniola). Adaptable, successful species; indeed, on Puerto Rico, where it occurs in locally high densities, it is considered a liability because of its predation on nests of the Puerto Rican Amazon (*Amazona vittata*), currently classed as Critical. Regarded as a pest of crop fruits in some regions.
Bibliography. Adolph & Roughgarden (1983), Anon. (1998b), Arendt (1980, 1985a, 1985b, 1997a, 1997b, 2000, 2004), Arendt & Arendt (1986), Arendt *et al.* (2004), Biaggi (1983), Bond (1985), Buden (1987, 1990), Diamond (1973), Faaborg (1985), Faaborg & Arendt (1995), Garrido & Remsen (1996), Hellmayr (1934), Hilty (2003), Hunt *et al.* (2001), John (1992), Keith (1997), Keith *et al.* (2003), Lack (1976), McLaughlin & Roughgarden (1989), Raffaele *et al.* (1998), Ricklefs & Bermingham (1997), Ridgely & Tudor (1989), Robertson (1962), Snyder & Taapken (1978), Snyder *et al.* (1987), Stotz *et al.* (1996), Uhazy & Arendt (1986), Wetmore (1927), Wetmore & Swales (1931), Zusi (1969).

9. Scaly-breasted Thrasher

Margarops fuscus

French: Moqueur grivotte **German**: Schuppenspottdrossel **Spanish**: Cuitlacoche Oscuro

Taxonomy. *Muscicapa fusca* Statius Muller, 1776, Martinique.
Sometimes placed in a monotypic genus *Allenia*; such treatment supported also by recent mtDNA work, but further research needed. Listed delimitations of races uncertain, and not congruent with recent mtDNA data; further study required. Five subspecies recognized.
Subspecies and Distribution.
M. f. hypenemus Buden, 1993 – N Lesser Antilles from St Martin, Saba and St Barthélémy S to Guadeloupe and Marie-Galante.
M. f. fuscus (Statius Muller, 1776) – C & S Lesser Antilles (Dominica, Martinique and, disjunctly, Grenada).
M. f. schwartzi Buden, 1993 – St Lucia, in SC Lesser Antilles.
M. f. vincenti Kratter & Garrido, 1996 – St Vincent, in S Lesser Antilles.
M. f. atlanticus Buden, 1993 – Barbados.
Descriptive notes. 23 cm; 53–98 g, average 67·1 g, *vincenti* mean 59·8 g, *schwartzi* mean 62·7 g, *hypenemus* (from St Kitts) mean 74·4 g. Large brownish mimid, rather short bill only slightly decurved, and reminiscent of a thrush (Turdidae). Nominate race has crown and upperparts dark grey-brown, feathers with darker centres, rump somewhat more rufescent, uppertail-coverts with small whitish spots central spots and tips; wings brownish-black, outer webs of secondaries edged rufous, tertials pale-tipped, greater wing-coverts tipped whitish (single wingbar); tail brownish-black, outer retrices conspicuously white-tipped; chin and throat whitish, streaked brown; underparts rather variable, generally whitish, especially in median portion, densely covered with bold, grey-brown scale-like markings; iris pale yellow; bill black; legs blackish-brown. Differs from *M. fuscatus* mainly in smaller size, shorter and black bill, darker plumage especially on wings and tail, obvious wingbar, narrower white tail markings, more scaly-looking breast. Sexes similar. Juvenile is like adult, but eye dark. Races vary primarily in size and in depth of colour of upperparts: *hypenemus* is largest, paler than nominate; *schwartzi* in intermediate in size, has more white in tail; *vincenti* is smallest, with darker plumage overall, narrower white margins on flank feathers; *atlanticus* is more reddish-brown above, with less white in tail. Voice. Series of varied notes and phrases, somewhat *Mimus*-like but softer, slower, less forceful.



Habitat. Found in range of habitats, from forest to semi-open woodland, also around settlements. More restricted to forest than is *M. fuscatus*; outnumbered latter in rainforest sites in mist-net surveys on St Lucia, Montserrat and St Kitts.
Food and Feeding. Omnivorous, feeding on range of arthropods, fruits, berries; apparently more frugivorous and less omnivorous than related mimids. Largely arboreal; forages high in canopy on Dominica and Guadeloupe, but much lower on Montserrat and St Kitts (which have fewer forest-bird species). On Dominica, forages in same trees and on same fruits as confamilial (longer-billed) *Cinclocerthia ruficauda* and *M. fuscatus*, and Forest Thrush (*Cichlherminia lherminieri*).
Breeding. May–Jun. Nest cup-shaped, placed in bush or tree. Clutch 2–3 eggs, unmarked greenish-blue. No other information available.
Movements. Resident; some wandering, as vagrants recorded in Grenadines.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Lesser Antilles EBA. Common to fairly common in most of N & C Lesser Antillean range and on St Vincent; rare and local on Grenada. Status on St Eustatius and Barbuda uncertain; previously rare, and possibly now extinct. Race *atlanticus*, confined to Barbados, probably extinct; small numbers found in 1920s, and one observed in 1987, but none found in 1998. Race *hypenemus* has recently extended its range N; colonized St Martin in or just before 2002, during which year at least 32 were found during search of a 20-ha study area.
Bibliography. Anon. (1998b), Arendt *et al.* (2004), Bond, J. (1963, 1985), Brewer (2001), Brown & Collier (2003), Buden (1993), Diamond (1973), Faaborg (1985), Faaborg & Winters (1979), Hellmayr (1934), Hunt *et al.* (2001), Keith (1997), Kratter & Garrido (1996), Lack (1976), McLaughlin (1990), Raffaele *et al.* (1998, 2003), Ricklefs & Bermingham (1997), Stotz *et al.* (1996), Terborgh *et al.* (1978), Zusi (1969).

PLATE 46 ➤



PLATE 46

inches 4
cm 10

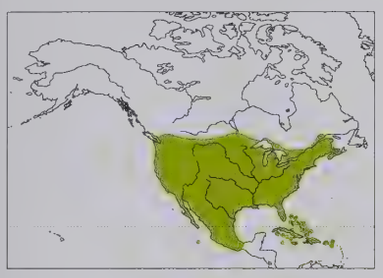
Genus *MIMUS* Boie, 1826

10. Northern Mockingbird

Mimus polyglottos

French: Moqueur polyglotte **German**: Spottdrossel **Spanish**: Sinsonte Norteño
Other common names: Common Mockingbird

Taxonomy. [*Turdus*] *polyglottos* Linnaeus, 1758, Virginia, USA.
Forms a superspecies, and sometimes considered conspecific, with *M. gilvus*; apparent hybrids between the two reported in S Mexico. Reported as interbreeding, probably rarely, with *M. gundlachii* in Caribbean. Race *leucopterus* sometimes merged with nominate. Proposed races *elegans* and *delinificus* (both from Bahamas), described largely on basis of whiter underparts, and *dominicus* (Haiti), supposedly with more white in wings, considered better treated within *orpheus*. Three subspecies recognized.
Subspecies and Distribution.
M. p. leucopterus (Vigors, 1839) – extreme SW Canada (S British Columbia E to S Manitoba) and W USA (E to Nebraska and Texas) S to S Mexico (rarely, to Isthmus of Tehuantepec), including Socorro I (off W Mexico) and many other offshore islands in Pacific Ocean and Gulf of California.
M. p. polyglottos (Linnaeus, 1758) – extreme SE Canada and E USA.
M. p. orpheus (Linneaus, 1758) – Bahamas S to Greater Antilles, Cayman Is and Virgin Is.



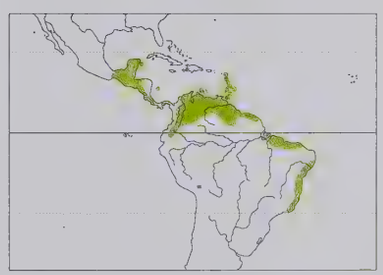
Descriptive notes. 23–28 cm; 36–56 g, average 48·5 g. Distinctive mid-sized mimid. Has dusky lores, greyish side of head with obscure whitish supercilium; crown and upperparts plain brownish-grey, upperwing-coverts tipped whitish (two narrow wingbars); base of primaries white (conspicuous white wing flashes in flight); tail blackish-grey, outer retrices white, adjacent two pairs with white inner webs; chin and throat whitish, greyish-brown submalar streaks; upper breast grey, buffier on sides and flanks, belly white, undertail-coverts buffy white; underwing pale, seen in upraised "wing-flashing" typical of genus; iris yellowish; bill blackish; legs dusky. Sexes similar, male on average c. 8% heavier than female. Juvenile is lightly streaked above and below, has legs paler, iris greyish. Races vary only little: *leucopterus* is slightly larger, paler, and relatively shorter-tailed than nominate; *orpheus* is paler than typical nominate, and smaller in Bahamas and Dominican Republic (but similar to nominate in average weight on Cuba, Jamaica and Puerto Rico). Voice. Loud, conspicuous and persistent song (accompanied by visual displays) familiar to many, a sustained, disjointed delivery of harsh to mellow notes and short phrases, of remarkably great diversity but little musicality; often sings nocturnally. Calls include short, explosive "chack" and "cheert" notes; a well-known mimic of other species.
Habitat. Wide range of low, rather open, often scrubby and disturbed vegetation. In E, typical of woodland edge and second growth, and parkland; common in suburbs, around gardens and lawns. In W, common in arid scrubland, as in Sonora, Mojave and Chihuahuan Deserts. In S, e.g. Oaxaca (S Mexico), inhabits thorn-scrub, open tropical deciduous and low oak (*Quercus*) woodland and edge, and low, open chaparral.
Food and Feeding. Omnivorous, feeds nearly equally on insects, e.g. beetles (Coleoptera), hymenopterans and orthopterans, and small, soft fruits. Arthropod prey predominates in breeding season, fruit in winter. Nestling diet initially only small arthropods, later with more fruit. Fruits from wide variety of shrubs and trees taken; smaller fruits plucked from shrubs and trees, larger ones often torn open; fallen fruit eaten on ground. Forages mostly on ground for animal prey; runs and hops on ground, usually in open situations; occasionally pounces on prey from elevated perch, hawks for flying insects, or flies briefly after prey disturbed on ground. Defends winter territory, often small, e.g. around dense fruiting rose (*Rosa*); aggression often directed against other bird species (including other mimids) that are food or foraging-site competitors.
Breeding. Mar–Aug, beginning earlier in S of range; 2–3 broods typical throughout range. Normally monogamous, but polyandry and bigamy reported uncommonly; partners may remain together beyond a single season. Aggressively territorial, defence by both sexes against potential nest predators, e.g. corvids, squirrels (Sciuridae), domestic cats; territory 0·5–2·5 ha (smaller territories often winter ones). Nest construction initiated by male as an open cup made from twigs, this lined with grass and completed by female; nest usually in dense shrub, typically low down (1–3 m), but height extremely variable depending on habitat, recorded to 19 m, and rarely nest placed in cavity or building. Clutch 2–6 eggs, mean number varies latitudinally on mainland, clutch size 3 in Puerto Rico (race *orpheus*); egg colour light to dark greenish-blue with brown to reddish blotch markings, denser at large end, occasionally unmarked; incubation by female, period 12–13 days; chicks brooded by female only, fed by both parents, leave nest after 10–15 days (average 12 days), at 60–70% of adult weight; young become competent in flight after 8 days, fed by parents for up to 3 weeks after departure from nest, during which adults begin renesting for next brood.
Movements. Largely sedentary over most of range. Some populations at N limits of range withdraw S after breeding, and elsewhere considerable local movements made between habitats with differing seasonal resources, i.e. breeding and wintering territories, sometimes even covering hundreds of kilometres. In S Mexico (Oaxaca), permanent resident above 900 m, but also winters down to sea-level. Some long-distance wandering occurs; occasional records well N of normal range in Canada, to islands in Hudson's Bay, and a few vagrants have crossed Atlantic Ocean to reach Europe.
Status and Conservation. Not globally threatened. Common and conspicuous throughout range. During 20th century, this species extended its range N along E coast of USA into E Canadian provinces; also colonized Socorro I, off W Mexico, in late 1970s/early 1980s. Appears to have been favoured by much recent habitat clearance, suburban growth, and expanded agricultural activity. Has spread with suburban growth into previously chaparral-covered hillsides in SW USA. Caribbean range recently expanded E to Virgin Is, towards Lesser Antilles. Nevertheless, population declines documented for most areas of USA over period 1966–1987; these are unexplained and thought not likely to be sustained in long term.
Bibliography. Adkisson (1966), Allen (1947), Amos (1991), Anon. (1998b), Arnold (1980), Baicich & Harrison (1997), Balat & de las Pozas (1981), Barrows (1978), Barrows *et al.* (1980), Bent (1948), Biaggi (1983), Biedenweg (1983), Binford (1989), Blom (1997), Bock & Bock (1988), Borror & Reese (1956), Brackbill (1951), Bradley (1985), Brazier (1964), Breitwisch (1987, 1988), Breitwisch & Gottlieb (1992), Breitwisch & Whitesides (1987), Breitwisch, Díaz, Gottlieb *et al.* (1986), Breitwisch, Díaz & Lee (1987), Breitwisch, Gottlieb & Zaias (1989), Breitwisch, Merritt & Whitesides (1984, 1986), Breitwisch, Ritter & Zaias (1986), Buden (1987), Burhans (2000), Burnett (1978), Campbell *et al.* (1997), Castrale & Donaldson (1986), Chamberlaine (1992), Clark (2001), Cobb *et al.* (1996), Conner (1978), Cyr & Larivée (1995), David *et al.* (1990), Derrickson (1985, 1987a, 1987b, 1988, 1989), Derrickson & Breitwisch (1992), Emlen (1977), Ficken & Ficken (1982), Fischer (1981b), Fisk (1973), Fulk *et al.* (1987), Gander (1931a, 1931b), Garrido & Kirkconnell (2000a), Hailman (1960a, 1960b), Hatch (1967), Hayslette (2003), Hedrick & Woody (1983), Hellmayr (1934), Hersek & Derrickson (1998), Horwich (1966), Howard (1974), Howell & Webb (1995), Hughes & Deloach (1997), Igl & Martin (2002), Joern & Jackson (1983), Johnsgard (1979), Justice (1996, 2000), Justice & Justice (1998), Justice & Logan (1995), Kale & Jennings (1966), Kaufman (1996a), Keith *et al.* (2003), Kirkconnell & Berovides (2000), Kochenberger (1984), Lanyon (1976), Laskey (1933, 1935, 1936, 1941, 1944, 1962), Lever (1987), Logan (1983, 1985, 1987, 1988, 1991, 1992, 1994a, 1994b, 1997), Logan & Derrickson (1996), Logan & Donaghey (1997), Logan & Fulk (1984), Logan & Hyatt (1991), Logan & Rulli (1981), Logan, Budman & Fulk (1983), Logan, Hyatt & Gregorcyk (1990), Mayfield (1934), Means (1974), Means & Goertz (1983), Merritt (1980, 1985), Michener, H. & Michener (1935), Michener, J.R. (1951, 1953), Miller (1938), Miskell & Justice (2001), Mitchell *et al.* (1996), Moore (1978), Mueller & Mueller (1971), Musante-Miller & Rothstein (1998), Peck & James (1987), Peer *et al.* (2002), Price *et al.* (1995), Root (1988), Roth (1979), Safina & Utter (1989), Selander & Hunter (1960), Shaver & Walker (1930), Simpson (1978), Small (1994), Smith (1986), Stewart (1980), Stiles (1982), Stotz *et al.* (1996), Sutton (1946), Taylor (1976), Thomas (1946), Thorn (1995), Utter (1971), Utter *et al.* (1983), Veals (1979), Visscher (1928), Werschkul (1978), Wetmore & Swales (1931), Whitaker (1957), Wiedenfeld *et al.* (1992), Wildenthal (1965), Zaias & Breitwisch (1989, 1990).

11. Tropical Mockingbird

Mimus gilvus

French: Moqueur des savanes **German**: Tropenspottdrossel **Spanish**: Sinsonte Tropical
Other common names: San Andres/St Andrew/Large-billed Mockingbird (*magnirostris*); Blue-grey Mockingbird (*antelius*)

Taxonomy. *Turdus gilvus* Vieillot, 1808, French Guiana.
Forms a superspecies, and sometimes considered conspecific, with *M. polyglottos*; apparent hybrids between the two reported in S Mexico. Race *magnirostris* sometimes treated as a separate species; *antelius* may also merit elevation to full species level. Population of *tolimensis* in Pacific lowlands of Central America (El Salvador S to Panama) originates largely from escaped cagebirds imported from Colombia. Ten subspecies currently recognized.
Subspecies and Distribution.
M. g. gracilis Cabanis, 1851 – S Mexico (E from E Veracruz and E Oaxaca) S to Honduras and El Salvador.
M. g. leucophaeus Ridgway, 1888 – Yucatán Peninsula, Cozumel I and other offshore islands.
M. g. magnirostris Cory, 1887 – San Andrés I, in SW Caribbean (off E Nicaragua).
M. g. rostratus Ridgway, 1884 – S Caribbean islands (Aruba E to Blanquilla).
M. g. antillarum Hellmayr & Seilern, 1915 – Lesser Antilles S from Antigua.
M. g. tolimensis Ridgway, 1904 – E El Salvador S to Costa Rica and C Panama, and W & C Colombia S to extreme N Ecuador.
M. g. melanopterus Lawrence, 1849 – N & NE Colombia, most of Venezuela (including Margarita I and Los Testigos), Guyana and N Brazil (Roraima).
M. g. tobagensis Dalmas, 1900 – Trinidad and Tobago.
M. g. gilvus (Vieillot, 1808) – Suriname and French Guiana.
M. g. antelius Oberholser, 1919 – coastal NE & E Brazil (S to Rio de Janeiro).



Descriptive notes. 23–25·5 cm; 88 g (*tolimensis*), means 58·4 g (*melanopterus*), 46·4 g (*antillarum*), 45·5 g (*rostratus*). Dull greyish mimid with short, straight bill. Nominate race has whitish supercilium, darker grey lores; crown and upperparts uniform grey, upperwing-coverts narrowly tipped whitish; wings and tail blackish, outer retrices with broad whitish tips; chin to vent whitish, breast tinged grey; whitish underwing (displayed in wing-flashing); iris colour varies, both geographically and individually, in nominate form typically dull yellowish, sometimes more olive, orange or brownish; bill and legs blackish. Differs from *M. polyglottos* in slightly larger size, no white in wing, less prominent tail markings. Sexes alike, female c. 5% smaller and lighter than male. Juvenile is browner, chest and flanks streaked dusky, eyes dark brown. Races vary mainly in plumage tone, extent of pale markings and size: *antelius* is longer-tailed than nominate, paler grey above, with flanks streaked, reduced white tips on rectrices; *antillarum* is darker above, with little grey on breast, wider but less sharply defined white on wing-coverts, iris commonly dark reddish-brown; *tobagensis* differs from previous in more extensive white tips on lateral rectrices, thicker (stouter but not longer) bill, iris commonly orange-brown; *melanopterus* is larger, paler above, almost pure white below, with more extensive white on outer rectrices, iris orange-brown to olivaceous; *rostratus* is similar to previous, but heavier-billed; *tolimensis* is also similar, but larger, with longer wings and tail; *gracilis* differs in browner upperparts, buffy-grey chest, and white (rather than grey) tips of wing-coverts; *leucophaeus* differs from previous in being more clear grey above, with narrow and grey edgings on wing-coverts, more extensive white on lateral rectrices; *magnirostris* is distinctive, much larger in size, also obviously heavier-billed than other races. Voice. Song, often heard at night, a varied and long-continued sequence of diverse mellow to harsh notes, trills, with considerable repetition of phrases, similar to song of *M. polyglottos*; pauses between phrases give song a discontinuous, staccato quality. Typical

On following pages: 12. Bahama Mockingbird (*Mimus gundlachii*); 13. White-banded Mockingbird (*Mimus triurus*); 14. Brown-backed Mockingbird (*Mimus dorsalis*); 15. Chalk-browed Mockingbird (*Mimus saturninus*); 16. Patagonian Mockingbird (*Mimus patagonicus*); 17. Chilean Mockingbird (*Mimus thenca*); 18. Long-tailed Mockingbird (*Mimus longicaudatus*); 19. Floreana Mockingbird (*Nesomimus trifasciatus*); 20. Espanola Mockingbird (*Nesomimus macdonaldi*); 21. San Cristobal Mockingbird (*Nesomimus melanotis*); 22. Galapagos Mockingbird (*Nesomimus parvulus*).

call a resonant "pree-ew", alarm a harsh "chuck" or "chek". Said to mimic only rarely, although certain individuals apparently accomplished mimics, even (only captives?) learning music, such as Brazilian national anthem.
Habitat. Generally open, scrubby, edge and savanna habitat, and arid coastal scrubland; common in disturbed habitat, around parks, farmland, habitations, including suburban gardens. Open savanna in N Venezuela; confined to sparse coastal *restinga* scrub in E Brazil, where *M. saturninus* common inland. Avoids closed forest and mangroves. Lowlands and middle elevations; reaches c. 2500 m in Central America and N Andes, occasionally to 2600 m in Colombia, and recently found as high as 3100 m in N Ecuador.
Food and Feeding. Broadly omnivorous. Diet comprises wide variety of arthropods, small fruits and berries, also larger crop fruits such as mango, sapodilla. Known to take bird and lizard eggs; also various birdfeeder offerings. Forages on ground or low in vegetation; hawks swarming termites in air.
Breeding. Extended season, e.g. Jan–Sept in Venezuela and in all months except Aug and Dec in Trinidad, but generally in late dry season to early wet season; at least three broods. Monogamous; co-operative breeding recorded in Panama and Venezuela, young of previous brood help in feeding subsequent brood and in territory defence, up to five adults and subadults found on a territory. Aggressively territorial; repels conspecifics and other species, as well as potential predators. Nest, built by both sexes, of coarse twigs lined with finer material, usually low down (mostly 1–4 m) in shrub or low tree, often not well concealed. Clutch 3 eggs, sometimes 2 or 4, blue-green, spotted or blotched reddish-brown; incubation by both sexes but predominantly by female, period 13–15 days; chicks fed by both parents, nestling period 12–15 days, occasionally to 19 days; young fed by parents after leaving nest, and some remain on territory during raising of later broods.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common and conspicuous nearly throughout range; less common in newly colonized areas, such as recently cleared highlands, and on Guadeloupe (in Lesser Antilles). First recorded in Ecuador in 1996. San Andrés race *magnirostris*, possibly a separate species, reportedly still common in 1989, despite development on island. Has recently spread N through Lesser Antilles; range has also expanded within some islands, such as Trinidad. Some expansion of range due to individuals escaping from captivity; this apparently the origin of several populations in lowlands of Central America. Benefits from forest clearance and other human activity, as it particularly favours disturbed areas and habitations of all sorts.
Bibliography. Anon. (1998b), Arendt *et al.* (2004), Binford (1989), Bond (1950), Brewer (2001), Chapman (1917), Cisneros-Heredia & Henry (2004), Dickey & van Rossem (1938), ffrench (1985, 1991), Fjeldså & Krabbe (1990), Friedmann & Smith (1950), Haverschmidt (1953), Haverschmidt & Mees (1994), Hellmayr (1934), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995), Keith (1997), Land (1970), Lee Jones (2004), Lever (1987), Maciel & da Costa (1997), Monroe (1968), Morton *et al.* (2004), Paredes (1998), Portecop (1985), Raffaele *et al.* (1998), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Sick (1993, 1997), Skutch (1968, 1985b), Snyder (1966), Stotz *et al.* (1996), Terborgh *et al.* (1978), Tostain *et al.* (1992), Tye & Tye (1991), Voous (1955), Wetmore *et al.* (1984), Wiedenfeld *et al.* (2001), Wunderle (1985).

12. Bahama Mockingbird

Mimus gundlachii

French: Moqueur des Bahamas **Spanish**: Sinsonte de Bahamas
German: Gundlachspottdrossel
Other common names: Gundlach's Mockingbird

Taxonomy. *Mimus Gundlachii* Cabanis, 1855, Cuba.
Possibly an island derivative of *M. polyglottos*, with which interbreeding reported but probably rare. Two subspecies recognized.
Subspecies and Distribution.
M. g. gundlachii Cabanis, 1855 – Bahamas, Camagüey Archipelago (N coast of Cuba) and Turks and Caicos Is.
M. g. hillii March, 1863 – S Jamaica.



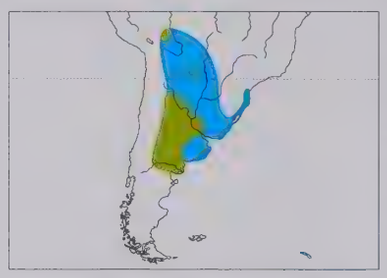
Descriptive notes. 28 cm; 57–85 g, average 66·8 g. Large brownish mockingbird with long tail. Has dark lores, mottled face, pale supercilium; brownish-grey above, dark streaks from crown to lower back, upperwing-coverts obscurely pale-tipped; outer retrices tipped whitish; throat white, dark malar stripe; underparts light grey, upper breast lightly streaked, flanks distinctly streaked; iris variable, dull yellow to brick orange; bill and legs blackish. Sexes similar, female slightly smaller and shorter-tailed than male. Juvenile is more densely spotted below. Race *hillii* has more prominent streaking on back, larger white tips on tail (mainly inner webs). Voice. Loud series of abrupt, varied notes and phrases, with repetition; reportedly less varied and more musical than song of *M. polyglottos*; males on adjacent territories sing antiphonally. Not known to mimic other species.
Habitat. Coastal strand, semi-arid scrub, open woodland, grassy areas with scattered trees, palmettos, plantations around habitation. Confined to arid scrubby woodland of limestone hills on S coast of Jamaica (race *hillii*). Tends to prefer denser, taller vegetation than that used by *M. polyglottos*; little overlap in Jamaica, where latter species occurs nearby in more open areas. Where sympatric with *Margarops fuscatus*, occupies scrub and woods away from settlements.
Food and Feeding. Omnivorous. Diet varied, from various terrestrial invertebrates to caterpillars, *Agave* nectar, and many small fruits such as figs (*Ficus*), *Bursera*, *Capparis*; also preys on small lizards. Forages mostly on ground, but also to 6 m within vegetation; more arboreal than *M. polyglottos*. On ground, searches leaf litter, turning litter and small stones with bill; extracts snails from shells. Interspecific aggression over food resources common; tends to exclude *M. polyglottos* from preferred feeding sites.
Breeding. Season Feb–Jul, from Apr in Cuba. Monogamous. Aggressively territorial, defends territory by vigorous song; territories overlap with those of *M. polyglottos*. Nest, built by both sexes, a rough open cup of twigs, lined with softer fibres, generally placed low down, range 0·5–4·5 m, in bush, occasionally on ground. Clutch 2–3 eggs, creamy to pinkish-white, with reddish-brown spots and blotches mostly at broad end; no information on incubation and nestling periods.
Movements. Resident; occasional wandering, and vagrants recorded in SE USA (S Florida).
Status and Conservation. Not globally threatened. Restricted-range species: present in Cuba EBA, Bahamas EBA and Jamaica EBA. Widespread and common in Bahamas, but absent from some NW islands; common in restricted range in S Jamaica (Hellshire Hills region). In Cuba, confined to Camagüey Archipelago, in N coast; common on some cays (Cruz, Guillermo), but rare and vulnerable on others. May be declining in parts of range as human habitations, and subsequent spread of *M. polyglottos*, expand on islands, e.g. San Salvador (EC Bahamas).
Bibliography. Aldridge (1984), Anon. (1998b), Bond (1985), Brewer (2001), Buden (1990), Downer & Sutton (1990), Emlen (1977), Garrido (1985), Garrido & Kirkconnell (2000a), Hellmayr (1934), Kaufman (1996a), Kirkconnell & Berovides (2000), Lack (1976), Miller (1978), Mlodinow & O'Brien (1996), Plockelman (1986), Raffaele *et al.* (1998, 2003), Steadman *et al.* (1980), Stotz *et al.* (1996).

13. White-banded Mockingbird

Mimus triurus

French: Moqueur à ailes blanches **Spanish**: Sinsonte Trescolas
German: Weißbinden-Spottdrossel

Taxonomy. *Turdus triurus* Vieillot, 1818, Paraguay.
Thought most closely related to, and perhaps forming a superspecies with, *M. dorsalis*. Monotypic.
Distribution. Breeds W Bolivia, W Paraguay and E Argentina (Salta S to N Río Negro); distribution poorly known, apparently patchy in N of range. Non-breeding E to S & SE Brazil.



Descriptive notes. 20–23·5 cm; 49–54 g, average in Brazil 51·5 g. Medium-sized mockingbird with distinct white wing patches. Has greyish crown, white supercilium, blackish line through eye, speckled ear-coverts; upperparts smoky grey, rump rufous-cinnamon; tail mostly white, black on central feather pairs, increasing amounts of white towards outer rectrices, wings blackish, prominent white patch on secondaries and coverts forming elongated band from shoulder to tips of outer secondaries (white in wing and tail conspicuous in flight, also in male display); whitish below, sides and flanks with cinnamon-brown wash, vent buffier, underwing white; iris sepia brown to yellow-orange; bill and legs blackish. Differs from *M. dorsalis* in having more white in wing, rufous rump. Sexes similar, female slightly smaller than male. Juvenile has less white in wing, and apparently has spotted breast. Voice. Superlative songster, the most outstanding of genus; song, often from exposed perch (average height 4·3 m in *monte* woodland), given throughout year, a long, loud and extended stream of melodic notes and phrases; also excellent mimic, S breeders reported as mimicking species apparently heard in non-breeding quarters in N.
Habitat. Low woodlands of *chaco* and *monte*, savannas; in *cerrado* scrubby woodland in Paraguay; open brushy country and steppe. Occurs around habitations. Generally less prevalent in lower, more open scrub favoured by *M. patagonicus* and *M. dorsalis*; overlaps with former in arid woodlands (*Geoffroya*, *Prosopis*) in SE Argentina, where avoids low *Larrea* scrub occupied by that species. Mainly lowlands below 500 m, but breeds to 2600 m in N Argentina; non-breeders at higher elevations in Bolivia and Chile.
Food and Feeding. Little information available. Probably largely insectivorous in breeding season.
Breeding. Nov–Dec. Displaying male runs along ground, jumps up while holding wings and tail open (white areas conspicuous), also performs song flights above vegetation. Nest is open structure of twigs, lined with plant fibres, flowers and rootlets, placed low in vegetation, often in thorny bush. Clutch 4 eggs, occasionally 3, greenish-blue with reddish-brown spots, thicker at large end; no information on incubation and nestling periods. Frequent host of Shiny Cowbird (*Molothrus bonariensis*).
Movements. Partially migratory, at least in S; non-breeders wintering birds found N to Bolivia and S & SE Brazil in austral winter. Non-breeding range not known precisely. Numerous records in Chile (S to Los Lagos) presumed to refer to vagrant, but possibly a regular non-breeding visitor in that country.
Status and Conservation. Not globally threatened. Common to fairly common throughout most of range. Precise distributions at various seasons not known; breeding records from Bolivia, Paraguay and N Argentina widely spaced, may represent disjunct populations, persistence of which may therefore be somewhat more precarious. Recent report from S Peru (L Titicaca) during breeding season (Dec) requires confirmation.
Bibliography. Araya & Chester (1993), Belton (1985), Brewer (2001), Canevari *et al.* (1991), Chebez *et al.* (1999), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Gambarotta (1985), Gochfeld (1978), Gyldenstolpe (1945), Harris (1998), Hayes (1995), Hellmayr (1934), Jaramillo (2003), Johnson (1967), Klimaitis & Moschione (1987), Marín (2004), Narosky & Yzurieta (1993), Ochoa de Masramón (1975), Olrog (1959), de la Peña (1987, 1989), Ridgely & Tudor (1989), Shardlow & Shardlow (2004), Short (1975), Sick (1993, 1997), Stotz *et al.* (1996), Tobias *et al.* (1993).

14. Brown-backed Mockingbird

Mimus dorsalis

French: Moqueur à dos brun **German**: Braunrücken-Spottdrossel **Spanish**: Sinsonte Castaño

Taxonomy. *Or[pheus] dorsalis* d'Orbigny and Lafresnaye, 1837, Cochabamba, Bolivia.
Thought most closely related to, and perhaps forming a superspecies with, *M. triurus*. Monotypic.
Distribution. W & S Bolivia (S from La Paz) and NW Argentina (S to Tucumán).



Descriptive notes. 21–25·5 cm; 52–65 g, average 58·7 g. Medium-sized brownish mockingbird. Has prominent whitish supercilium, dusky lores and ear-coverts; crown and upperparts chestnut-brown, brightest on rump, crown with darker streaks; upperwing-coverts tipped narrowly white (two narrow white wingbars), primary coverts white; flight-feathers and tail blackish, bases of primaries white and outer 3–4 rectrices white (conspicuous white wing and tail markings in flight); whitish below, tinged buff on chest, sides and flanks; iris brownish; bill and legs black. Differs from *M. triurus* in slightly

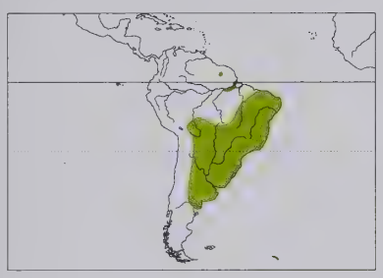
larger size, heavier bill, browner back, less white in wing. Sexes similar, but female slightly smaller than male. Juvenile has dusky spotting on breast. VOICE. Song is a series of repeated harsh notes and chuckles; reportedly much inferior in vocal array and melodic quality to that of *M. triurus*.
Habitat. Arid montane scrub in higher foothills and upper Andean slopes, 1700–4200 m, mostly 2300–3500 m. Inhabits brush, open desert shrubs and hedgerows; commonly found near habitations.
Food and Feeding. Feeds largely on ground, holding tail cocked. No information on diet or foraging behaviour.
Breeding. Breeds Nov–Mar. Cup-shaped nest of twigs, often placed in cactus, sometimes in bush. Clutch 4 eggs, light green with chestnut and grey spots. No other information.
Movements. Resident; report of vagrant in Chile (Arica) apparently questionable.
Status and Conservation. Not globally threatened. Poorly known. Apparently common wherever suitable habitat is to be found. No known threats to persistence of populations.
Bibliography. Brewer (2001), Canevari *et al.* (1991), Chebez *et al.* (1999), Darrieu & Camperi (1993), Dunning (1993), Fjeldså & Krabbe (1990), Flores & Capriles (1998), Gyldenstolpe (1945), Hellmayr (1934), Hennessey *et al.* (2003), Marín (2004), Meyer de Schauensee (1982), Narosky & Yzurieta (1993), Olrog (1959), de la Peña (1987, 1989), Ridgely & Tudor (1989), Stotz *et al.* (1996).

15. Chalk-browed Mockingbird

Mimus saturninus

French: Moqueur plombé **German**: Camposspottdrossel **Spanish**: Sinsonte Calandria

Taxonomy. *Turdus saturninus* M. H. K. Lichtenstein, 1823, Pará, Brazil.
Thought most closely related to, and perhaps forming a superspecies with, *M. patagonicus*. Four subspecies recognized.
Subspecies and Distribution.
M. s. saturninus (M. H. K. Lichtenstein, 1823) – S Suriname and N Brazil (lower Amazon in Pará).
M. s. frater Hellmayr, 1903 – C & E Bolivia and C Brazil (E to Ceará, W Bahia and Rio de Janeiro, S to Mato Grosso and Santa Catarina).
M. s. arenaceus Chapman, 1890 – NE Brazil (Paraíba S to E Bahia).
M. s. modulator (Gould, 1836) – SE Bolivia and Paraguay S to C Argentina, extreme SE Brazil (Rio Grande do Sul) and Uruguay.



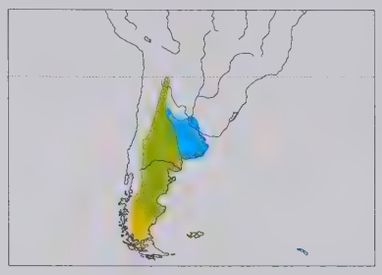
Descriptive notes. 23·5–26 cm; 55–73 g. One of the largest *Mimus* species, brownish, with long legs, long graduated tail held semi-erect. Nominate race has dark crown, conspicuous broad white supercilium, blackish line from lores through eye to top of ear-coverts; upperparts brownish with darker striations, rump more buffish-tinged, upperwing-coverts tipped white (rather obscure white wingbars); flight-feathers and tail blackish, conspicuous white tips on all except central rectrices, outer webs white-sided; white below, breast greyer, sides tinged buffy, flanks faintly streaked darker; iris yellow; bill black; legs blackish. Sexes similar, female slightly smaller than male. Juvenile is browner than adult, underparts buffier, dark streaks on breast. Races exhibit minor variation in body size, bill length and plumage: *frater* is more brownish above than nominate, with no buff tinge on rump; *arenaceus* is similar to previous but larger-billed; *modulator* is also very similar, distinguished by more blackish-brown spotting on crown and upper back, lack of grey suffusion on chest, and flanks with decidedly paler buffy tinge and less conspicuous streaks or even unstreaked. VOICE. Loud, varied series of notes, trills, phrases; call note a characteristic, sharp and penetrating "tshrip", alarm a "snorting sha-sha-sha". Habitually mimics other species, including Roadside Hawk (*Buteo magnirostris*) and American Kestrel (*Falco sparverius*), but not known for any degree of virtuosity.
Habitat. Broad variety of non-forest habitat: savannas, forest edge, low open woodland, scattered trees in pastures, *cerrado* bushland in Paraguay and Brazil, also *caatinga* scrub in Brazil, and palm swamp in Suriname. Common around rural settlements, also urban parks and gardens. Inhabits relictual savannas in lower Amazonia (nominate race) and NE Brazil (*arenaceus*). Lowlands; to c. 2500 m in Argentina (near Tucumán).
Food and Feeding. Omnivorous; diet includes insects, e.g. orthopterans and beetles (Coleoptera), also spiders (Araneae), worms, small fruits, seeds, berries. Larger seeds and stones (or pits) of drupes regurgitated. Occasional predator on eggs and nestlings of other birds. Forages largely on ground.
Breeding. Breeds Sept–Jan. Monogamous. Helpers at nest recorded in Brazil and Argentina, in some cases young of previous brood, in other cases verified as unrelated to breeding pair, assist in territorial defence, nest-guarding and brood-feeding. Territorial; territory 6–20 ha in very open habitat, less than 1 ha in optimal habitat; defended also against *M. gilvus*. Nest built over period of 5 days, a loosely constructed, shallow cup, often with old nest used as base, lined with finer materials, placed in crown of low tree, or in dense, often spiny, shrub, 0·5–6·5 m above ground, mostly 1·3–3 m (average 1·9 m at Argentina study site). Clutch 3–4 eggs, pale greenish-blue with dense reddish-brown spots and blotches, especially at larger end; hatching asynchronous; incubation period reported as 12 days in Brazil, also 13–15 days in Argentina; chicks fed by both parents, also by any helpers present, nestling period 15 days in Brazil, 12–14 days in Argentina; nestlings susceptible to botfly (*Philornis*) infestation; young fed by parents for c. a week out of nest, remain on parental territory through subsequent non-breeding season. Common host of Shiny Cowbird (*Molothrus bonariensis*), especially in S (c. 80% of nests parasitized); accepts spotted version of dimorphic cowbird eggs, rejects unspotted version.
Movements. Mostly resident; southern populations (e.g. in SE Brazil) appear to be partially migratory.
Status and Conservation. Not globally threatened. Very common throughout much of range. Occurs in several protected areas, e.g. Serra da Canastra National Park, in Brazil, and Costanera Sur Ecological Reserve, in Argentina. No perceived threats, although nesting losses due to cowbird parasitism are considerable.
Bibliography. Argel de Oliveira (1991), Brewer (2001), Canevari *et al.* (1991), Chebez *et al.* (1999), Chikilian & Bee de Speroni (1985), Couve & Vidal-Ojeda (2003), Darrieu & Camperi (1993), Fjeldså & Krabbe (1990), Fraga (1979, 1985), Gyldenstolpe (1945), Haverschmidt & Mees (1994), Hayes (1995), Hellmayr (1934), Klimaitis & Moschione (1987), Maciel & da Costa (1997), Mason (1985, 1986), Narosky & Yzurieta (1993), de la Peña (1987, 1989, 1995), Ridgely & Tudor (1989), do Rosário (1996), Salvador (1984), Scott & Brooke (1985), Short (1975), Sick (1985, 1993, 1997), da Silva *et al.* (1997), Stotz *et al.* (1996), Tobias *et al.* (1993).

16. Patagonian Mockingbird

Mimus patagonicus

French: Moqueur de Patagonie **German**: Patagonienspottdrossel **Spanish**: Sinsonte Patagón

Taxonomy. *Or[pheus] patagonicus* d'Orbigny and Lafresnaye, 1837, Río Negro, Argentina.
Thought most closely related to, and perhaps forming a superspecies with, *M. saturninus*. Monotypic.
Distribution. NW, C & S Argentina and S Chile (Aisén, Magallanes) S to Strait of Magellan; casual in Tierra del Fuego.



Descriptive notes. 22–25 cm; male 44·4–61·8 g, female 43·8–65·4 g. A smaller, shorter-tailed version of *M. saturninus*. Has brown crown, whitish supercilium extending back from eye, blackish line through eye; upperparts unstreaked greyish-brown, rump buffier, upperwing-coverts with pale tips (two narrow wingbars); wings and tail blackish, flight-feathers edged white, whitish tips of retrices except central pair, narrow white edge on sides of outer rectrices; buffy grey below, throat and belly lighter; iris sepia brown; bill and legs black. Differs from *M. saturninus* in smaller size, shorter tail, shorter and narrower supercilium. Sexes similar, female slightly smaller than male. Juvenile has breast spotted blackish. VOICE. Song, from exposed perch or within vegetation, a warbling series of varied notes and phrases, said to resemble that of *M. thenca* but more melodious, delivered continuously for lengthy periods; mimics other species.
Habitat. Low and open desert shrublands, from scrubby *Larrea* in N part of range, and *Geoffroyia* (*chañar*) open *monte* woodland and *Prosopis* bushland in C region, to Patagonian steppe in S; sea-level to 1800 m. In SE Argentina (Río Negro) occupies low woodland with *M. triurus*, but at lower density than latter and uses lower song perches (3·2–3·6 m) in vegetation.
Food and Feeding. Mainly insectivorous during breeding; also takes fruits and berries (e.g. *Berberis*) outside breeding season. Feeds largely on ground. Conspicuous and tame in some regions, shy in others.
Breeding. Breeds Jan in N Argentina (Tucumán) and Oct–Dec in S Chile. Monogamous; consorts in family groups beyond breeding season. Apparently territorial. Nest an open twiggy cup, lined with soft materials, built low in vegetation. Clutch 3–6 eggs, greenish with brownish spots and blotches; no details available on incubation and nestling periods.
Movements. Resident in N. Migratory in S Argentina and Chile; absent from Patagonian breeding grounds Apr–Sept.
Status and Conservation. Not globally threatened. Relatively common throughout most of range; not common in Chile, but tends to keep to thick cover there and possibly overlooked. No known threats to populations.
Bibliography. Araya & Chester (1993), Bernath (1965), Brewer (2001), Canevari *et al.* (1991), Chebez *et al.* (1999), Contreras & Roag (1976), Couve & Vidal-Ojeda (2003), Darrieu & Camperi (1993), Fjeldså & Krabbe (1990), Gochfeld (1978), Harris (1998), Hellmayr (1934), Humphrey *et al.* (1970), Jaramillo (2003), Johnson (1967), Narosky & Yzurieta (1993), Navas & Bó (1986), Ochoa de Masramón (1975), Olrog (1959), de la Peña (1987, 1989), Ridgely & Tudor (1989), Short (1975), Stotz *et al.* (1996).

17. Chilean Mockingbird

Mimus thenca

French: Moqueur du Chili **German**: Chilespottdrossel **Spanish**: Sinsonte Tenca

Taxonomy. *Turdus thenca* Molina, 1782, Chile.
Most closely related to *M. longicaudatus*, with which forms a superspecies; both appear closest to genus *Nesomimus*. Monotypic.
Distribution. C Chile (W Atacama S to Valdivia).



Descriptive notes. 28–29 cm; 66 g. Large brownish mockingbird with long tail, long, thick bill. Has broad whitish supercilium; brownish-grey above, darker streaks on head, neck and back, rump browner (N birds apparently paler, more grey and less brown); upperwing-coverts with whitish tips (two narrow wingbars); wings and tail blackish, tail feathers (except central pair) tipped white, outer rectrices white-edged; throat whitish, brownish-black malar stripe at side; lighter brownish-grey below, becoming dirty white on belly, flanks buffy brown with elongated blackish markings; iris yellowish olive-brown to sepia brown; bill and legs black. Differs from *M. longicaudatus* in shorter bill, much shorter tail, more black in wing. Sexes alike, female somewhat smaller than male. Juvenile is more streaked and buffier below. VOICE. Song, given throughout year, a series of sweet, variable notes and phrases; lacks harsher and more disjointed quality of *M. polyglottos* song; excellent mimic of other bird species.
Habitat. Wide range of habitats, from sea-level to 2200 m. Breeds in semi-desert and low, succulent coastal scrub, *Bahia* scrubland, interior savanna bushland (*Acacia caven*, *Prosopis*), and dense evergreen *matorral*; reaches highest density in *matorral* on foothill slopes of coast ranges. Occurs on edge and in shrubby patches within relictual low woodland patches (e.g. Bosque Fray Jorge National Park). Also in disturbed habitats, successional scrub and, more rarely, around habitations and in urban areas. Absent from *Nothofagus* and *Cryptocarya* woodland in S; also avoids alien pine (*Pinus*) plantations in C Chile.
Food and Feeding. No details on diet; assumed omnivorous, taking insects and fruits. Forages largely on ground, but also in vegetation to 3 m or more. In dense *matorral* 2 m tall, foraging times spent in three height categories (ground, ground to 1 m, and 1–2 m) were 55%, 28% and 17%, respectively; corresponding figures for 2-m open *Acacia* bushland 92%, 7% and 1%, and for 1-m low coastal scrub 85%, 15% and 0%. Time on ground includes periods spent in turning leaf litter, and digging around plant stems and under fallen branches; time spent above ground includes searching of vegetation for insects. Also perches on telephone poles and utility wires.

Breeding. Nesting from Nov. Monogamous; territorial, presumably throughout year; territory in optimal *matorral* habitat c. 1 ha, larger in *algorrobles* of *Acacia/Prosopis*, and larger still in low coastal scrub. Nest of twigs, some thorny, lined with wool or moss, usually low in vegetation, often in cactus, well protected from approach by thorny or spiny branchesClutch 2–4 eggs, usually 3, blue-green with heavy reddish and purplish markings; no information on incubation and nestling periods.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Central Chile EBA. Common throughout range; occurs in several protected areas, e.g. La Campana and Bosque Fray Jorge National Parks. No known threats to populations.
Bibliography. Araya & Chester (1993), Araya & Millie (1986), Brewer (2001), Cody (1975), Cody & Mooney (1978), Cornelius *et al.* (2000), Couve & Vidal-Ojeda (2003), Fjeldså & Krabbe (1990), Goodall *et al.* (1957), Hellmayr (1932, 1934), Jaramillo (2003), Johnson (1967), Marín (2004), Martínez del Río *et al.* (1996), Ridgely & Tudor (1989), Rozzi *et al.* (1996), Stotz *et al.* (1996).

18. **Long-tailed Mockingbird**

Mimus longicaudatus

French: Moqueur à longue queue **Spanish**: Sinsonte Colilargo
German: Langschwanz-Spottdrossel

Taxonomy. *M[imus] longicaudatus* Tschudi, 1844, Peru.
Most closely related to *M. thenca*, with which forms a superspecies; both appear closest to genus *Nesomimus*. Nominate race and *albogriseus* appear to intergrade in NW Peru. Race *maranonicus* doubtfully distinct from nominate. Four subspecies tentatively recognized.
Subspecies and Distribution.
M. l. albogriseus Lesson, 1844 – SW Ecuador (S from C Manabí).
M. l. platensis Chapman, 1924 – I de la Plata, off W Ecuador (SW Manabí).
M. l. longicaudatus Tschudi, 1844 – W Peru.
M. l. maranonicus Carriker, 1933 – La Libertad (upper Marañón Valley), in NW Peru.



Descriptive notes. 27–29·5 cm; 54–79 g, average 66·6 g. Large greyish mockingbird with very long, graduated tail. Nominate race has prominent white supercilium, black eyestripe from lores to upper ear-coverts, connecting to rear with black patch on lower ear-coverts; white cheeks, narrow black malar stripe; crown and upperparts brownish-grey, streaked darker, upperwing-coverts pale-tipped, white patch on primary coverts; flight-feathers and tail dusky brown, primary bases whitish, white tips of outer rectrices (both wing and tail patches conspicuous in flight); throat, belly and vent whitish; breast dull brown, feathers with blackish centres at breast sides, and dull buff margins elsewhere; flanks tinged buffy brown, with some blackish streaks; iris sepia brown to yellow; bill and legs dark. Sexes alike, female slightly smaller than male. Juvenile has streaky chest. Race *albogriseus* is somewhat smaller than nominate, also greyer, with larger white tail tips; *platensis* resembles previous but larger, and longer billed; *maranonicus* is very similar to nominate. Voice. Song, to be heard throughout day, is a loud, persistent, continued string of chuckling notes and phrases; not known to mimic other bird species.
Habitat. Found in desert scrub and arid woodland within coastal zone, in brush, hedgerows and tree groves in cleared country and agricultural areas. Recorded to 1900 m in Ecuador (Loja); race *maranonicus* at 2450 m in Marañón Valley (Peru), and perhaps non-breeding to 2950 m (Huaytará).
Food and Feeding. Diet broad, including terrestrial and marine invertebrates, fruits, berries. Forages largely on ground; hops with tail elevated, glides between foraging sites with spread wings and tail. Occurs in loose groups outside breeding season.
Breeding. Late Dec to Jul; season c. 5–6 months in SW Ecuador (Santa Elena Peninsula), source of most information on breeding. Generally monogamous, but two females may lay in one nest. Territorial; extra birds noted on territory, may be young from previous brood. Nest a rough cup of thorny twigs, lined with fine rootlets, other plant material and hair, placed in interior of dense, spiny bush or cactus at height of 0·5–5 m (average 1·67 m); nest-site reused, but new nest built for successive broods. Clutch 3–4 eggs, average 3·9 (clutch size 3 before seasonal rains, averaging close to 4 after rains), colour greenish and more or less heavily spotted and blotched reddish-brown (variable); incubation period 12–13 days; hatching more or less synchronous, nestling period 12–14 days; young fed by parents after leaving nest. Common host of Shiny Cowbird (*Molothrus bonariensis*). Success varies between years, depending on rainfall amount.
Movements. Resident; possible vagrant reported from extreme N Chile.
Status and Conservation. Not globally threatened. Common. Distribution patchy, restricted to discontinuous habitat in barren Peru coast region; range has recently expanded to S. Race *platensis* is the only endemic bird species on I de la Plata, 30 km off Ecuador coast; island protected as part of Machalilla National Park. Race *maranonicus* also has small range, confined to upper Marañón Valley of NW Peru.
Bibliography. Brewer (2001), Butler (1979), Chapman (1926), Clements & Shany (2001), Fjeldså & Krabbe (1990), González & Málaga (1997), Hellmayr (1934), Marchant (1959, 1960), Meyer de Schauensee (1982), Parker *et al.* (1995), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Ridgely *et al.* (1998), Rodner *et al.* (2000), Stotz *et al.* (1996), Walker (2002), Zimmer (1930).

Genus *NESOMIMUS* Ridgway, 1890

19. **Floreana Mockingbird**

Nesomimus trifasciatus

French: Moqueur de Floreana **German**: Floreanaspottdrossel **Spanish**: Sinsonte de Floreana
Other common names: Charles/Three-banded/Santa Maria Mockingbird

Taxonomy. *Orpheus trifasciatus* Gould, 1837, Floreana Island (formerly Charles Island), Galapagos Archipelago.
Genus considered most closely related to, and putatively derived from, mainland *Mimus longicaudatus*; hybridization between latter and present species recorded in captivity. Forms a superspecies with *N. macdonaldi*, *N. melanotis* and *N. parvulus*; all previously considered conspecific. Birds on Campeón somewehat smaller than those on Gardner-near-Floreana, but difference considered insufficient to warrant naming of geographical races. Monotypic.
Distribution. Islets of Gardner-near-Floreana and Campeón (near Floreana), in S Galapagos Is.



Descriptive notes. 25–26 cm; male 65·7 g, female 59·8 g. Large greyish mimid with rather long, somewhat decurved bill. Has pale eyeline, dark-mottled buffish ear-coverts; crown and upperparts greyish-brown, minimally streaked, upperwing-coverts tipped white (two wingbars); whitish below, dark patch on side of breast, a few obscure spots across breast and on flanks; iris dark brown; bill and legs blackish. Sexes similar, female smaller than male. Juvenile is more streaked than adult. Voice. Loud, melodious song; does not mimic other species.
Habitat. Desert and semi-desert scrub with a few trees and arborescent cacti; low littoral vegetation.
Food and Feeding. Omnivorous, primarily insectivorous. Food includes carrion (seabirds, lizards), probably also seabird eggs. Forages mainly on ground, but also at all heights in vegetation, depending on food resource (e.g. cactus fruit).
Breeding. Oct–Apr; two broods. Co-operative breeder, 4–5 adults per territorial group, group size correlates positively with territory size; territory size averages c. 2 ha; one breeding female per group. Nest a cup of twigs, lined with finer material, placed nearly exclusively in cactus, occasionally in other shrub. Clutch 2–4 eggs; no other information. Most females disperse from natal territory and breed at younger age than males; males tend to inherit parental territory, are older at first reproduction attempt.
Movements. Sedentary.
Status and Conservation. ENDANGERED. Restricted-range species: present in Galapagos Islands EBA. Once abundant on Floreana, where became extinct since before 1888; now restricted to two small adjacent islets. Estimated global population fewer than 300 individuals; population crashes routine during dry "La Niña years". Numbers on Campeón (10 ha) varied from 24 to 53 individuals between 1980 and 1991; 150–200 or more estimated on larger Gardner-near-Floreana (80 ha). Reasons for disappearance from Floreana debated, but probably nest predation by introduced black rats (*Rattus rattus*); as Floreana, unlike other islands of Galapagos, lacks native rats, introduced ones a novelty. Habitat degeneration from browsing goats possibly also a contributory factor. Some concern that, in absence of immigration from Floreana, the birds on these tiny islets may have lost a significant amount of genetic diversity, rendering them more vulnerable to fatal diseases.
Bibliography. Abbott & Abbott (1978), Bowman & Carter (1971), Brewer (2001), Castro & Phillips (1996), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Curry (1986a, 1986c, 1987, 1989), Curry & Anderson (1987), Curry & Grant (1990), Granizo (2002), Grant, N. (1983), Grant, P.R. *et al.* (2000), Harris (1968, 1982), Hellmayr (1934), King (1978/79), Stattersfield & Capper (2000), Stotz *et al.* (1996), Swarth (1931), Wege & Long (1995).

20. **Espanola Mockingbird**

Nesomimus macdonaldi

French: Moqueur d'Espanola **German**: Españolaspottdrossel **Spanish**: Sinsonte de Española
Other common names: Hood (Island) Mockingbird

Taxonomy. *Nesomimus macdonaldi* Ridgway, 1890, Española Island (formerly Hood Island), Galapagos Archipelago.
Genus considered most closely related to, and putatively derived from, mainland *Mimus longicaudatus*. Forms a superspecies with *N. trifasciatus*, *N. melanotis* and *N. parvulus*; all previously considered conspecific. Monotypic.
Distribution. Española and adjacent Gardner-near-Española, in SE Galapagos Is.



Descriptive notes. 26·5–28 cm; male average 76·1 g, female average 64·8 g. Largest of genus, bill very long and decurved. Has obscure thin pale supercilium, black lores, blackish ear patch, faint black malar trace; crown greyish-brown, somewhat streaked; feathers of upperparts with blackish-brown centres and grey to brownish-grey margins, giving streaked or scalloped appearance, the dark centres obscure on hindneck, margins browner on rump; upperwing-coverts tipped off-white; flight-feathers blackish with white tips, remiges and greater coverts with tawny edges, tail dark brown; whitish below, indistinct brown markings on breast, streaky flanks; iris yellow-brown; bill blackish; legs black. All blackish feathers become paler and browner in worn plumage. Differs from congeners in larger size, longer bill, less white in tail, less distinct facial patterning. Sexes similar, female smaller than male. Juvenile is more streaked below than adult. Voice. Loud, strident song ; does not mimic other species.
Habitat. Arid littoral scrub, low thorny mesquite (*Prosopis*) scrub, scrubby woodland with scattered trees (*Bursera*) and arborescent cacti.
Food and Feeding. Omnivorous; wide range of food items, from insects, and fruits and berries, to marine arthropods, small vertebrates, and scavenged items from seabird and hawk nests. Eats carrion from carcasses of seabirds, lizards, sea-lions (Otariinae); readily eats damaged seabird eggs, can open others with powerful bill. Habitually drinks blood, especially in dry season. Forages mainly on ground, but also in vegetation, depending on food resource (e.g. cactus fruits). Occurs in groups of up to 40 individuals outside breeding season. Removes and eats ticks (Acarina) from marine and land iguanas (*Conolophus*). Blood taken from wounds in living sea-lions, from sea-lion placentas, marine iguanas (*Amblyrhynchus*), nestling boobies (*Sula*), from site of Galapagos Hawk (*Buteo galapagoensis*) kill of iguana, even from wounds on legs of humans. Blood-drinking habit peculiar to this one member of genus; possibly facilitated, at least in origin, by consequences of hawk predation.

Breeding. Mar–Apr; timing highly synchronized. Co-operative breeder; often just one breeding pair per group, sometimes more ("plural" breeding groups); generally 7–10 adults per territorial group, group size correlates positively with territory size; territory size averages c. 1·5 ha. Nest a cup of twigs lined with finer material, placed in cactus, occasionally in other shrub. Clutch usually 2–4 eggs, sometimes 1; no information on incubation and fledging periods; young in nest fed by several adults (up to four recorded).
Movements. Sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Galapagos Islands EBA. Common within its tiny range of Española (58 km²) and one adjacent islet. Global population in the range 1000–2500 individuals; total numbers vary among years. Lives at higher densities than others of genus, up to 16 adults/ha. Primary conservation concern over this species stems from the fact that it is confined to two small islands on which its population trends are not known. Extreme weather events in the Galapagos could possibly have adverse effects on this species similar to those suffered by *N. trifasciatus*. No evidence that either Española or Gardner-near-Española has been populated by rats; accidental introduction of alien predators would have major adverse consequences for this species.
Bibliography. Abbott & Abbott (1978), Bowman & Carter (1971), Brewer (2001), Burtt *et al.* (1994), Castro & Phillips (1996), Curry (1987, 1989), Curry & Anderson (1987), Curry & Grant (1990), Granizo (2002), Grant (1983), Harris (1968, 1982), Hatch (1965, 1966), Heinzel & Hall (2000), Hellmayr (1934), Stattersfield & Capper (2000), Stotz *et al.* (1996), Swarth (1931), Swash & Still (2000).

21. San Cristobal Mockingbird

Nesomimus melanotis

French: Moqueur de San Cristobal **Spanish**: Sinsonte de San Cristóbal
German: San Cristobal-Spottdrossel
Other common names: Chatham (Island) Mockingbird

Taxonomy. *Orpheus melanotis* Gould, 1837, San Cristóbal Island (formerly Chatham Island), Galapagos Archipelago.
Genus considered most closely related to, and putatively derived from, mainland *Mimus longicaudatus*. Forms a superspecies with *N. trifasciatus*, *N. macdonaldi* and *N. parvulus*; all previously considered conspecific. Monotypic.
Distribution. San Cristóbal I, in E Galapagos Is.



Descriptive notes. 25–26 cm; male average 53·2 g, female average 48 g. A smaller *Nesomimus*, intermediate in appearance between *N. macdonaldi* and *N. parvulus*, with decurved bill comparatively short. Has obscure narrow whitish supercilium, prominent black lores and blackish ear patch, narrow black malar stripe; crown and upperparts greyish-brown, somewhat streaked, upperwing-coverts tipped whitish (two wingbars); flight-feathers and tail dark brown, outer three rectrices with off-white tips; whitish below, sometimes slightly buff-tinged on throat, breast side with tiny dark spots, flanks with blackish-brown streaking; iris amber to dark reddish-brown; bill and legs blackish. Sexes similar, female c. 10% smaller than male in linear dimensions. Juvenile is more streaked below than adult. VOICE. Loud, melodious and disjointed territorial song typical of genus.
Habitat. Occupies a wide range of habitats, from lowlands up to island summit at 715 m: found in low and open arid scrub in lowlands, also mangroves, to low scrubby woodland with scattered trees (*Bursera*) and arborescent cacti (*Opuntia*), and taller *Bursera* and *Piscidia* woodland patches; also low woodland of introduced guava (*Psidium guajava*). Not all available habitat on island occupied; avoids dense lowland forest, taller, wetter woodland, *Bursera*-dominated scrub, and grassland.
Food and Feeding. Feeds on terrestrial arthropods, including crickets and grasshoppers (Orthoptera); also takes fruits and berries. Occasionally picks ticks (Acarina) off marine iguanas (*Amblyrhynchus*), but not known to drink blood. No evidence of feeding on seabird eggs (perhaps owing to low availability). Forages mostly on ground, searches litter for arthropods; also low in vegetation for fruits.
Breeding. Jan–Apr, later at higher elevations. Territorial, often with additional adult; 25–50% of pairs had extra, subordinate male, but no evidence that latter assists in nest-building, nest defence, or feeding of young; territory 3–5 ha or more, considerably larger than in congeners, territory size increases with group size. Nest, built by both sexes, a bulky structure of twigs, lined with grasses, placed 4–5 m up in crotch of tree. Clutch 2–5 eggs, usually 4, greenish with reddish-brown spots and blotches; incubation by female alone, nestlings fed by both parents; no information on incubation and nestling periods.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Galapagos Islands EBA. Considered to be common on the single, large island of San Cristóbal (552 km²). Overall density is rather low, at 0·5–0·7 individuals/ha. No perceived threats to population or status, but introduced black rats (*Rattus rattus*) and feral cats on island might pose problems in the future.
Bibliography. Abbott & Abbott (1978), Bowman & Carter (1971), Brewer (2001), Castro & Phillips (1996), Curry (1987, 1989), Curry & Anderson (1987), Curry & Grant (1990), Grant (1983), Harris (1968, 1982), Heinzel & Hall (2000), Hellmayr (1934), Hundley (1963), Stotz *et al.* (1996), Swarth (1931), Swash & Still (2000), Venables (1940).

22. Galapagos Mockingbird

Nesomimus parvulus

French: Moqueur des Galapagos **Spanish**: Sinsonte de Galápagos
German: Galapagosspottdrossel
Other common names: Black-eared/Salvador/Abingdon Mockingbird (*personatus*); Isabela/Albemarle Mockingbird (*parvulus*)

Taxonomy. *Orpheus parvulus* Gould, 1837, Isabela Island (formerly Albemarle Island), Galapagos Archipelago.
Genus considered most closely related to, and putatively derived from, mainland *Mimus longicaudatus*. Forms a superspecies with *N. trifasciatus*, *N. macdonaldi* and *N. melanotis*; all previously considered conspecific. Race *personatus* has sometimes been treated as a separate species; described race *bindloei* (from Marchena I) considered indistinguishable from aforementioned. Six subspecies recognized.
Subspecies and Distribution.
N. p. hulli Rothschild, 1898 – Darwin (Culpepper) I.
N. p. wenmani Swarth, 1931 – Wolf (Wenman) I.
N. p. personatus Ridgway, 1890 – islands of Pinta (Abingdon), Marchena (Bindloe), Santiago (James) and Rabida (Jervis).
N. p. bauri Ridgway, 1894 – Genovesa (Tower) I.
N. p. parvulus (Gould, 1837) – islands of Isabela (Albemarle), Fernandina (Narborough), Daphne, Santa Cruz (Indefatigable) and nearby islets.
N. p. barringtoni Rothschild, 1898 – Santa Fe (Barrington) I.



Descriptive notes. 25–26 cm; male average 56·2 g, female average 51·2 g. Smallish *Nesomimus*, slightly decurved bill relatively shorter and less robust than most others. Nominate race has whitish stripe behind eye, blackish-brown lores and prominent ear patch, obscure malar streak; crown blackish-brown, upperparts greyish-brown, back with darker, brownish streaks, upperwing-coverts tipped whitish (two wingbars); flight-feathers and tail dark brown, remiges edged pale on outer webs, outer rectrices tipped whitish; whitish below, broad whitish collar on sides of neck, few brownish streaks on breast side and flanks; iris yellowish; bill and legs blackish. Sexes similar, female c. 6–8% smaller than male in linear dimensions. Juvenile is more streaked below than adult. Races exhibit minor variations in overall size, coloration and markings: *personatus* is larger than nominate, bill longer, sides and flanks more strongly tinged brown; *wenmani* has paler upperparts, wider wingbars; *hulli* is similar to nominate, but with distinct blackish malar streak, much broader whitish terminal margins of remiges; *bauri* differs from previous in slightly more distinct streaks or spots on back, darker grey crown, more heavily streaked flanks; *barringtoni* has shorter wing than last. VOICE. Loud, melodious territorial song typical of genus; calls harsh, strident. Does not mimic other species.
Habitat. Range of habitats, from low, arid coastal scrub to low *Bursera* woodland with scattered, emergent cacti and scrubby understorey; also mangroves on Genovesa I (where all available habitat was occupied).
Food and Feeding. Omnivorous. Diet largely arthropods, including caterpillars, orthopterans, centipedes (Chilopoda); also fruit and nectar from cactus and other shrubs and trees (*Lantana*, *Bursera*); some vertebrates (lizards) taken. Nestling fed largely with insect larvae. Takes and eats unattended seabird eggs; preys on nestling birds; cleans ticks (Acarina) off land iguanas (*Conolophus*). Incidence of blood-drinking low or zero in most races; carrion-feeding widespread. Observed to steal orthopteran from a large centipede. Forages largely on ground and low in vegetation.
Breeding. Oct–Apr, occasionally to Jul; on Genovesa (race *bauri*) egg-laying normally begins Jan, after first rains of season; normally double-brooded, second attempt after 12-day break. Mostly monogamous, but polygyny occurs in 7% of males and 33% of females (Genovesa). Co-operative breeder, in groups of up to 24 individuals (average about six on Genovesa), which may comprise several breeding pairs (up to four breeding females, each laying in separate nest; known as "plural breeding") and several helpers, latter mostly male offspring of previous broods, others may be failed breeders; territory defined by single dominant male, defended by group throughout year; average territory size c. 2·5 ha (Genovesa), increases with group size, but smaller per breeding pair in "plural groups". Nest of twigs, lined with finer materials, placed low down (up to c. 1 m) in tree or cactus, higher (to 6 m) in taller vegetation. Clutch 4 eggs, occasionally 2 or 3, greenish with reddish-brown spots; incubation period 12–13 days; chicks fed by both parents, assisted by one or more helpers, nestling period 11–17 days. Breeding success higher in wetter "El Niño years"; also, nests with helpers produced average 1·9 fledglings, 20% more than those without helpers; success of nests of subordinate pairs in territory reduced by interference by dominant pair.
Movements. Sedentary; vagrants recorded from Pinzón (Duncan) I, the only island in Galapagos with no breeding mockingbird population.
Status and Conservation. Not globally threatened. Restricted-range species: present in Galapagos Islands EBA. Common, even abundant, on most islands of its range; somewhat less numerous on largest island, Isabela, where perhaps more habitat disturbance and introduced nest predators. The most widespread and the best-studied of the Galapagos mockingbirds; much of the work on this species conducted on Genovesa (17·4 km²), where race *bauri* very common.
Bibliography. Abbott & Abbott (1978), Bowman & Carter (1971), Brewer (2001), Castro & Phillips (1996), Curry (1986b, 1987, 1988a, 1988b, 1989), Curry & Anderson (1987), Curry & Grant (1989, 1990, 1991), Fusani *et al.* (1994), Grant, N. (1983), Grant, P.R. & Grant (1979), Harris (1968, 1982), Hellmayr (1934), Kinnaird & Grant (1982), Skutch (1987), Stotz *et al.* (1996), Swarth (1931), Trimble (1976), Vargas (1987), Venables (1940).



PLATE 47

inches 4

cm 10

Genus *MIMODES* Ridgway, 1882

23. Socorro Mockingbird

Mimodes graysoni

French: Moqueur de Socorro **German**: Socorrospottdrossel **Spanish**: Sinsonte de Socorro
Other common names: Socorro Thrasher

Taxonomy. *Harporhynchus graysoni* Lawrence, 1871, Socorro Island, Mexico.
Monotypic genus, presumed derived from *Mimus*. Recent genetic analysis suggests that it belongs in a clade that contains four *Mimus* species (*M. polyglottos*, *M. gilvus*, *M. gundlachii*, *M. saturninus*) and that it should be placed in that genus. Monotypic.
Distribution. Socorro I, in Revillagigedo Archipelago, 600 km W of mainland Mexico.



Descriptive notes. 24–26·5 cm; average 75·5 g. Large, brownish mockingbird with short, straightish bill, lacking prominent wing and tail markings. Plumage is uniformly greyish-brown above, lores, wings and tail slightly darker, indistinct thin pale supercilium, two narrow pale wingbars (indistinct), outer rectrices pale-tipped; whitish below, few dusky streaks on flanks; iris yellow-amber or brownish-red; bill and legs blackish. Distinguished from *Mimus polyglottos* by larger size, browner coloration, lack of prominent white wing and tail markings. Sexes similar, female slightly smaller and 6·5% lighter in weight than male. Juvenile has streakier underparts, wingbars buff, eyes darker. VOICE. Extended delivery of diverse notes and phrases, similar to song of *Mimus polyglottos* but notably more melodious, less repetitive; various call notes, mellow to harsh and nasal.
Habitat. Mixed open woodland and wooded canyons at higher elevations, above 300 m (mostly above 600 m); also a few fig (*Ficus*) groves near coast. Commonest in undisturbed habitat, but absent from low-elevation scrub and all degraded woodlands; little habitat overlap with *Mimus polyglottos* (a recent immigrant). Was previously widespread in all island vegetation types, including scrub, woodland and woodland edge.
Food and Feeding. Omnivorous. Diet includes large insects, young leaves, small fruits (*Ficus*, *Bumelia*), also small vertebrates (lizards), land crabs. Possible predator on nests of small birds, e.g. Tropical Parula (*Parula pitiayumi*) and Socorro Wren (*Troglodytes sissonii*). Foraging habits diverse; feeds on ground, also in vegetation up to canopy; forages along beach, and hawks for flying insects. Scavenges around sheep carcasses, and accepts food items from island visitors. Runs rapidly, with tail cocked.
Breeding. Peak in Mar–May, season possibly Nov–Jul. Apparently monogamous. Territorial, male remains on same territory for more than one season, female less sedentary; seen to chase *Mimus polyglottos* from territory. Nest an open twiggy cup, lined with mosses and epiphytes, placed at average of 3·7 m in tree (average tree height 5·4 m). Clutch 3 eggs, bluish-green with large brownish spots concentrated at wider end; incubation period no more than 15 days; hatching apparently asynchronous, chicks fed by both parents, nestling period maximum 14 days; large fledged young continue to be fed by parents.
Movements. Sedentary.
Status and Conservation. CRITICAL. Restricted-range species: present in Socorro Island EBA. Formerly abundant, up to at least 1958; now greatly reduced. By 1978 numbers had declined drasticly; population estimated at c. 350 individuals in 1994, since when perhaps even fewer. Decline began with human settlement, after 1958; apparently not related to recent colonization of Socorro I around 1980 by *Mimus polyglottos*, which now abundant on island but thought unlikely to be an important competitor, as it is smaller than present species and differs ecologically. Suggested reasons for dramatic decline include predation by domestic cats (introduced in early 1970s), which may have caused extinction of Socorro Dove (*Zenaida graysoni*); various studies, however, reveal little evidence that predation a serious problem. Most likely cause is severe overgrazing by introduced rabbits, pigs and, especially, sheep, which has already destroyed a great deal of the species' habitat and which prevents woodland regeneration. Survival of species will depend on stringent conservation measures following designation of Revillagigedo Archipelago as a Biosphere Reserve in 1994; a conservation programme aimed at removing both sheep and cats from the island has already started.
Bibliography. Anon. (1998b), Anthony (1898), Brattstrom & Howell (1956), Castellanos & Rodríguez (1992, 1993), Ceballos & Valdelamar (2000), Collar & Andrew (1988), Collar, Crosby & Stattersfield (1994), Collar, Gonzaga *et al.* (1992), Grayson (1872), Gulledge (1975), Hellmayr (1934), Howell & Webb (1995), Jehl (1983), Jehl & Parkes (1982, 1983), Martínez-Gómez & Curry (1995, 1996, 1998a, 1998b), Martínez-Gómez *et al.* (2001), McLellan (1926), Parkes (1990), Rodríguez-Estrella *et al.* (1996), Santaella & Sada (1991), Stattersfield & Capper (2000), Stotz *et al.* (1996), Villa (1960), Wege & Long (1995).

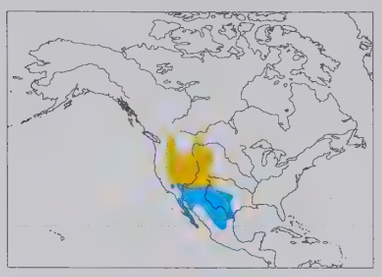
Genus *OREOSCOPTES* S. F. Baird, 1858

24. Sage Thrasher

Oreoscoptes montanus

French: Moqueur des armoises **Spanish**: Cuitlacoche de las Artemisas
German: Bergspottdrossel

Taxonomy. *Orpheus montanus* J. K. Townsend, 1837, Wyoming, USA.
Monotypic genus, thought most closely related to *Mimus*. Monotypic.
Distribution. Breeds SW Canada (extreme S British Columbia, extreme SW Saskatchewan) S in W USA to E California, C Arizona and NW New Mexico; non-breeding S to C Mexico.



Descriptive notes. 20–23 cm; 40–50 g. Small, plain, mimid with relatively short bill. Plain appearance alleviated by whitish supercilium above dark eyeline, and whitish submoustachial area above dark malar line; plumage otherwise brownish-grey above, wings and tail browner, outer rectrices prominently white-tipped; throat white; rest of underparts whitish, flanks and undertail-coverts buff, with prominent brown streaks, often absent on belly; streaking much less obvious when plumage worn; iris yellow to amber; bill and legs dusky brown. Sexes similar, female smaller than male. Juvenile is paler and streaked above, markings on underparts less distinct. VOICE. Song distinctive, vigorous, far-reaching, a long string of varied notes and phrases with little apparent repetition, maintained for many minutes without break (average in SW Idaho 166 seconds, but ranging to uninterrupted 22 minutes); mimics other species, e.g. Western Meadowlark (*Sturnella neglecta*), Brewer's Sparrow (*Spizella breweri*) and Horned Lark (*Eremophila alpestris*), but mimicry not conspicuous or routine. Calls include guttural "chuck", whistled "whee-er" and scolding notes.
Habitat. Characteristic species of sagebrush (*Artemisia*) plains, especially of intermontane Great Basin Desert. Associated prominently with tall, dense sagebrush, but utilizes other vegetation of similar structure and height (e.g. c.1 m), such as saltbush (*Atriplex*). In non-breeding season, found in arid and semi-arid habitats, including dry brushland and desert.
Food and Feeding. Primarily insectivorous, at least during breeding season; main foods grasshoppers and crickets (Orthoptera), ants (Hymenoptera) and beetles (Coleoptera), occasionally seeds and berries. Forages nearly exclusively on ground, searching beneath bushes and digging for food in tussocks, litter and detritus.
Breeding. Egg-laying begins Apr to early May; two broods apparently typical. Monogamous; territory defended by song, undulating flights, and chasing. Nest, built by both sexes, a bulky open cup of twigs, lined with grass, fur and other soft materials, typically placed within taller shrub, but commonly on ground; territory 0·4–1·7 ha. Clutch 3–7 eggs, mostly 4–5, mean varies among years and sites, eggs blue to greenish-blue, boldly spotted and blotched; incubation by both sexes, period 12–15 days; chicks fed by both sexes (which approach nest on ground), spend up to 13 days in nest, but commonly only 10–11 days; young not capable of flight for c. 1 week after leaving nest, continue to be fed by parents.
Movements. Migratory. Winters immediately S of breeding range, from S California, C Arizona, New Mexico and W Texas S to C Mexico (Baja California, interior S to Hidalgo, occasionally farther S). Present in non-breeding range in lower Colorado Valley Jan–Apr. Arrival on breeding grounds late Mar to Apr; not until Jun in far N (S British Columbia). Vagrants reported N to C Canada and throughout USA (E to Atlantic coast).
Status and Conservation. Not globally threatened. Fairly common to uncommon. Threats largely from changes in and clearance of breeding habitat; wintering habitat in deserts not subjected to much alteration. Conversion of sagebrush habitats to grazing land of crested wheatgrass (*Agropyron cristatus*) eliminates this species; sagebrush fires reduce breeding density dramatically. Listed as a "species of concern" in Washington state, where its sagebrush habitat has been extensively reduced by clearing. In Canada (British Columbia), under consideration for "endangered and threatened" status, as only a few hundred hectares of suitable habitat remain in the several S valleys of the province that provide breeding habitat.
Bibliography. Anon. (1998b), Baicich & Harrison (1997), Bent (1948), Blood (1995), Campbell *et al.* (1997), Cannings (1992), Carter (1977), Clark & Blom (1992), Dalzell (1999), DeGraaf & Rappole (1995), Evers (1987), Fischer (1981a), Gilman (1907), Gooding (1970), Hellmayr (1934), Hoffman & Hoffman (1987), Horn & Christie (1985), Howe (1992), Howe *et al.* (1996, 2000), Johnsgard (1979), Kaufman (1996a, 1999), Killpack (1970), Knick & Rotenberry (1995), Knowlton & Harmston (1942b), Krementz (1980), Mattsson (1985), McNicholl (1988), Moore (1986), Petersen (1986), Petersen & Best (1991), Peterson (1994), Price *et al.* (1995), Reynolds (1979, 1981), Reynolds & Rich (1978), Reynolds *et al.* (1999), Rich (1978, 1980a, 1980b, 1985, 1993), Rich & Rothstein (1985), Rideout & Belthoff (2000), Righter (1997), Root (1988), Root *et al.* (1981), Rotenberry & Wiens (1989), Small (1994), Vander Haegen *et al.* (2002), Weber (1991), Wiens & Rotenberry (1981), Wilson (1986).

Genus *TOXOSTOMA* Wagler, 1831

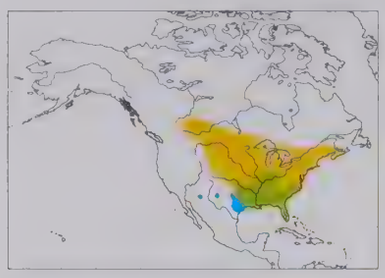
25. Brown Thrasher

Toxostoma rufum

French: Moqueur roux **German**: Rote Spottdrossel **Spanish**: Cuitlacoche Rojizo

Taxonomy. [*Turdus*] *rufus* Linnaeus, 1758, South Carolina, USA.
Forms a superspecies with *T. longirostre* and *T. guttatum*, and the three sometimes considered conspecific. Two subspecies recognized.
Subspecies and Distribution.
T. r. longicauda (S. F. Baird, 1858) – Great Plains from S Canada (SE Alberta E to SW Ontario) S in USA to Colorado and Kansas.
T. r. rufum (Linnaeus, 1758) – SE Canada (SE Ontario E to Nova Scotia) and C & E USA (S to E Texas and Gulf coast).
Descriptive notes. 23·5–30·5 cm; 61–89 g, average 69 g. Large, long-tailed mimid with long, slightly curved bill, long legs. Crown and upperparts are rufous-brown, side of head and neck buffy brown; wings and tail rufous, two white wingbars; throat whitish, pale submoustachial stripe, dark malar stripe; pale buff below, whiter on central belly, heavy black streaks on breast and sides, browner streaks on flanks; plumage brightest in autumn, when fresh; iris orange-yellow; bill blackish, with

On following pages: 26. Long-billed Thrasher (*Toxostoma longirostre*); 27. Cozumel Thrasher (*Toxostoma guttatum*); 28. Grey Thrasher (*Toxostoma cinereum*); 29. Bendire's Thrasher (*Toxostoma bendirei*); 30. Ocellated Thrasher (*Toxostoma ocellatum*); 31. Curve-billed Thrasher (*Toxostoma curvirostre*); 32. Le Conte's Thrasher (*Toxostoma lecontei*); 33. California Thrasher (*Toxostoma redivivum*); 34. Crissal Thrasher (*Toxostoma crissale*).



pale base to lower mandible; legs variable, flesh-coloured to brownish. Differs from *T. longirostre* mainly in much brighter rufous coloration above. Sexes alike, male sometimes slightly heavier than female. Juvenile is rufous with buffy mottling above, wingbars buff, iris grey. Races differ minimally: *longicauda* is paler than nominate, less densely streaked below, also larger on average (wing by 7 mm, tail by 8·5 mm). VOICE. Loud, exuberant territorial song consists of extended delivery of rich, fluty phrases of extraordinary variety, each often twice-repeated; male also emits much quieter song when female close by; occasionally mimics other species, e.g. Northern Flicker (*Colaptes auratus*) and Northern Cardinal (*Cardinalis cardinalis*), but with no great accuracy. Calls various, including typical, abrupt "kek" or "tchuck", also higher whistled or nasal and slurred "teea, teea" notes.

Habitat. Dense shrubbery, well-vegetated residential areas, woodland edge, post-fire second growth; in W of range, also riparian woodland, windbreaks, wooded draws in open country.

Food and Feeding. Generalized omnivore; feeds on insects and other arthropods, gastropods, seeds and fruits. Insect consumption highest in breeding season; berries and seeds predominate in late summer, autumn and winter. Forages nearly exclusively on ground; searches for insects in leaf litter displaced by sweeping the bill from side to side; excavates hidden prey with bill. Fruits and berries taken from low bushes; large, tougher fruits (e.g. acorns) lodged in crevice and hammered with bill. Maintains and defends territories in wintering areas.

Breeding. Season varies with latitude; in USA, egg-laying from Apr (in SE) to late May (C); two broods typical in SE of range. Monogamous. Strongly territorial, more likely to return to previous territory if last breeding successful there; excludes other mimids (*Dumetella carolinensis*, *Mimus polyglottos*) from territory; territory generally 0·5–1·25 ha. Nest, built mostly by both sexes, a bulky, twiggy, grass-lined open cup, typically placed 1–2 m above ground in dense shrub, occasionally on ground. Clutch 2–6 eggs, usually 3–4, densely spotted brown on white to blue-green background; incubation by both sexes, period 12–13 days, occasionally 11 or 14 days; chicks fed by both parents, spend up to 11–12 days in nest; on leaving, able to run well but flight weak, fed by parents for at least another week.

Movements. Short-distance migrant in N; S populations resident. N breeders winter in SC & SE USA, mostly within breeding range but extending to C Texas (where non-breeding only). Leaves wintering grounds in SE USA in late winter, arrival at breeding grounds between early Mar (Kentucky) and mid-May (Canada). Vagrants recorded at least twice in Europe; one individual remained from Nov 1966 to early Feb 1967 on a coastal headland in S England.

Status and Conservation. Not globally threatened. Common over most of range; sporadic at NW & W edges. Probably expanded its population range and density in E & NE USA with post-settlement forest clearance and expanded scrub habitats; now likely contracting somewhat with forest maturation and mechanized agriculture. Known to suffer losses in fields and orchards treated with insecticides. Given title of the "official bird" for the state of Georgia.

Bibliography. Amos (1991), Anderson (1979), Andrews (1987), Anon. (1998b), Askins (1993), Baicich & Harrison (1997), Bancroft (1994), Becker (1940), Bent (1948), Boughey (1978), Boughey & Thompson (1976, 1981), Brown (1976), Cade (1986), Campbell *et al.* (1997), Castrale & Donaldson (1986), Cavitt (1998, 1999), Cavitt & Haas (2000), Cavitt *et al.* (1999), Chamberlain (1954), Cyr & Larivée (1995), Engels (1940), Erwin (1935), Facemire (1978), Fischer (1979b, 1981a), Fischer & Fischer (1981), Flanigan (1971), Gabrielson (1912), Grant (1992), Grimpe (1984), Haas, C.A. (1985, 1990, 1998), Haas, C.A. & Haas (1998), Heagy & Best (1983), Hellmayr (1934), Hilton (1992), Incledon (1968), Johnsgard (1979), Johnston (1958), Kaufman (1996a), Kroodsma & Parker (1977), Land (1996), Larsen & Goller (2002), McAtee (1940), McNair & Duyck (1991), Means (1974), Michael (1970), Miller *et al.* (1996), Mitchell *et al.* (1996), Murphy & Fleischer (1986), Nichols (1953), Partin (1977), Pearse *et al.* (1996), Peck & James (1987), Price *et al.* (1995), Raynor (1976), Rivers & Sandercock (2004), Root (1988), Small (1994), Smith (1986, 1991), Taylor (1984), Tedards (1982), Tyler, J.D. (1994), Van Tyne (1946), Zink *et al.* (1999).

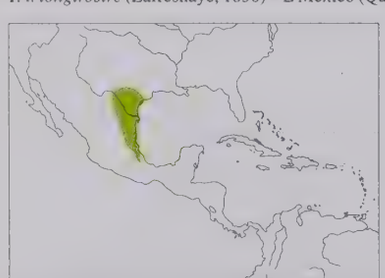
26. Long-billed Thrasher

Toxostoma longirostre

French: Moqueur à long bec **Spanish**: Cuitlacoche Piquilargo
German: Langschnabel-Spottdrossel

Taxonomy. [*Orpheus*] *longirostris* Lafresnaye, 1838, Mexico.
Forms a superspecies with *T. rufum* and *T. guttatum*, and the three sometimes considered conspecific. Race *sennetti* intergrades with nominate in S Tamaulipas (E Mexico). Two subspecies recognized.

Subspecies and Distribution.
T. l. sennetti (Ridgway, 1888) – S USA (SC Texas) and NE Mexico (S to E San Luis Potosí and Tamaulipas).
T. l. longirostre (Lafresnaye, 1838) – E Mexico (Querétaro, S Tamaulipas and Veracruz S to Puebla).



Descriptive notes. 26 cm; 61–89 g, average 68 g. Large, long-legged mimid with long tail, long, decurved bill. Nominate race is greyish-brown above, head somewhat mottled, cheeks greyish, richer brown on back and rump; wings rich brown, two white wingbars; tail plain rufous; throat white, dark malar stripe; whitish below, strongly streaked blackish; plumage brighter in autumn, when fresh; iris orange; bill black; legs brown. Differs from *T. rufum* mainly in being less rufous, more greyish, above. Sexes alike. Juvenile is similar to adult, but feathers buffy-edged above, wingbars buff, iris yellow. Race *sennetti* is slightly larger, with shorter bill, paler and more greyish than nominate, with narrower streaking on underparts and much of belly unstreaked. VOICE. Song, conspicuous in Mar–Jul, much less frequent at other times of year, of repeated rich, fluty to warbled phrases, much like that of *T. rufum* but possibly with less repetition of phrases; no mimicry reported. Calls include harsh "chuck", "tsuck" and "kleak" notes, loud, mellow "cheeoop" calls, also a "verss" call repeated vigorously at dawn and dusk.

Habitat. Dense shrubs, thorny thickets, low, brushy woodland and riparian woodland; to 1500 m.

Food and Feeding. Generalized omnivore, feeds on insects, e.g. grasshoppers and crickets (Orthoptera), beetles (Coleoptera), ants (Hymenoptera) and moths (Lepidoptera), and other arthropods, also gastropods, crustaceans, and berries. Forages largely on ground; searches for prey in leaf litter by vigorous bill-sweeping from side to side; scratches, pecks and probes under litter. Ascends bushes and low trees to take fruits and berries. Winter territory variable in size with habitat, 0·25–1·6 ha; vigorously defended, but unknown whether by individuals or pairs, excludes *T. rufum* and a variety of overwintering thrushes (Turdidae), but ignores *T. curvirostre* in same habitat.

Breeding. Peak of egg-laying Apr–May in Texas, May–Jun in Mexico; two broods likely. Monogamous; strongly territorial; territory size reported as 1·3–3 ha. Nest an open cup of thorny twigs, grass-lined, placed 1·2–2·4 m (average 1·6–1·7 m) above ground, typically in dense, thorny bush under shading trees. Clutch 3–4 eggs, occasionally 2 or 5, eggs thickly covered with fine brown spots on whitish background; incubation by both sexes, period 13–14 days; chicks fed by both parents, leave nest at 13 days, at which time run well but flight weak; young fed by parents for up to several weeks after leaving nest.

Movements. Resident, but winter territories not coincident with breeding territories; may undertake local movements in response to winter food availability.

Status and Conservation. Not globally threatened. Fairly common in most of range. Formerly abundant. Clearance of 95% of the brushland favoured by this species in lower Rio Grande Valley assumed to have had major impact on Texas population; similar loss of habitat has occurred in NE Mexico, presumably with similar negative results. Several large National Wildlife Refuges (Santa Ana, Lower Rio Grande Valley) may be key to S Texas conservation efforts.

Bibliography. Anon. (1998b), Baicich & Harrison (1997), Bent (1948), Blake (1953), Brewer (2001), Fischer (1978, 1979a, 1979b, 1980, 1981a, 1983), Hellmayr (1934), Howell & Webb (1995), Kaufman (1996a), Kingery (1993), Murphy & Fleischer (1986), Oberholser (1974), Price *et al.* (1995), Stotz *et al.* (1996), Sutton & Pettingill (1942), Tweit (1997), Urban (1959), Zink *et al.* (1999).

27. Cozumel Thrasher

Toxostoma guttatum

French: Moqueur de Cozumel **German**: Cozumelspottdrossel **Spanish**: Cuitlacoche de Cozumel

Taxonomy. *Harporhynchus guttatus* Ridgway, 1885, Cozumel Island, Quintana Roo, Mexico.
Forms a superspecies with *T. rufum* and *T. longirostre*, and the three sometimes considered conspecific. Monotypic.

Distribution. Cozumel I, off NE Yucatán Peninsula (Mexico).



Descriptive notes. 21·5–24 cm; 49–60 g, average 52·8 g. Large, long-tailed mimid with fairly long, decurved bill. Plumage is rufous-brown above, cheeks greyish, pale supercilium, wings with two whitish wingbars, tail rufous; throat white, dark malar stripe; underparts whitish, strongly streaked black, spots largest on flanks; belly and crissum white to buffy; iris amber; bill blackish; legs dark brown. Distinguished from similar *T. longirostre* mainly by considerably smaller size (more than 20% by weight). Sexes similar. Juvenile undescribed. VOICE. Song rich, varied warbled and scratchy phrases, reportedly much like that of *T. longirostre*; relatively little repetition of phrases within song bouts.

Habitat. Dense, scrubby and thorny woodland, also semi-deciduous and deciduous forest; lowlands.

Food and Feeding. No detailed information; probably a generalized omnivore like related *T. rufum* and *T. longirostre*. Skulks on or near ground.

Breeding. Season May–Jul. No other information.

Movements. Resident.

Status and Conservation. CRITICAL. Restricted-range species: present in Cozumel Island EBA. Very rare, with very few recent sightings. Formerly common to abundant, with population of up 10,000 individuals estimated in mid-20th century. Numbers drastically reduced following a very severe hurricane in 1988, and only three individuals found (all mist-netted) during ensuing seven years; after another damaging hurricane, in 1995, this species not recorded at all in annual surveys, and feared extinct by some. In Jun 2004, however, a single individual was discovered, the first for almost nine years. Although the two hurricanes assumed responsible for the species' demise, Cozumel I must have suffered similar meteorological phenomena at relatively frequent intervals prior to 1988; it could be expected to have evolved means of surviving the huge damage wrought by such events. Was earlier reported as inhabiting scrubby woodland and dense undergrowth, and edges of tropical forest, but the three individuals found in 1994 and 1995 were well away from scrub (two in deciduous forest, one in semi-deciduous forest). Thorough investigation of this species' ecology may help to provide further explanation for its exceedingly rapid decline. It is probably the mimid at greatest risk of imminent extinction.

Bibliography. Anon. (1998b, 2004c, 2004d), Blake (1953), Brewer (2001), Ceballos & Valdelamar (2000), Hellmayr (1934), Howell (1999), Howell & Webb (1995), Johnson (1988), Klaas (1968), Macouzet & Escalante (2001), Martínez (2004), Paynter (1955), Stattersfield & Capper (2000), Stotz *et al.* (1996), Zink *et al.* (1999).

28. Grey Thrasher

Toxostoma cinereum

French: Moqueur gris **German**: Grauspottdrossel **Spanish**: Cuitlacoche Ceniciento
Other common names: San Lucas Thrasher (*cinereum*)

Taxonomy. *Harporhynchus cinereus* Xántus de Vesey, 1860, Cape San Lucas, Baja California, Mexico.
Thought most closely related to, and forming a superspecies with, *T. bendirei*. Two subspecies recognized.

Subspecies and Distribution.
T. c. mearnsi (Anthony, 1895) – NW & C Baja California (S from c. 31° N and, in E, from 28·5° N), in NW Mexico.
T. c. cinereum (Xántus de Vesey, 1860) – C & S Baja California, including islands off SE coast (San José, Cerralvo).

Descriptive notes. 24–26·5 cm; 59–70 g, male average 63·9 g, female average 54·4 g. Large, greyish thrasher with longish, decurved bill. Nominate race is ashy grey-brown above, side of head browner and mottled, lower back, rump, wings and tail tinged richer brown; upperwing-coverts edged whitish (two narrow wingbars), outer three rectrices with whitish tips, conspicuous from below; throat and underparts whitish, buffier on flanks, dark brown spots on chest, breast and



sides, deltoid to elongated spots on lower side; lower belly buffy white, buffier crissum; plumage with warmer browns and buffs after late-summer moult; iris yellow; bill and legs blackish. Sexes similar in appearance. Juvenile is more rusty brown than adult, especially tips of wing and tail feathers, iris brown. Race *mearnsi* is darker, more rusty-coloured above, more heavily spotted below than nominate. VOICE. Song, usually from elevated perch, long series of bold, varied notes and phrases, each repeated two or more times, rather discontinuous and creaky, in quality reminiscent more of *T. curvirostre* song than that of more closely related *T. bendirei*. Calls a rolling "cheeerr-it" and stacatto "chek".

Habitat. Desert scrub, commonly in taller, more diverse vegetation with emergent trees and columnar cacti; in far S, common in tall thorn-scrub, open woodland, also at higher elevations in chaparral belt with scattered oaks (*Quercus*). Sea-level to c. 1000 m, locally to 1500 m.

Food and Feeding. Diet arthropods, cactus fruits (*Opuntia*, *Pereskiopsis*, *Wilcoxia*), likely also other fruits. Forages largely on ground in cover; excavates litter beneath shrubs; runs rapidly between foraging sites.

Breeding. Mar–Apr in NW coastal area (race *mearnsi*); Mar to mid-Jul, with young from early Apr, in S Cape region (nominate). Apparently monogamous, pairs show some site-fidelity; territorial; territory size c. 2–2·5 ha in thorn-woodland of Cape region and taller desert scrub elsewhere, as small as 1·5 ha in coastal scrub in NW. Nest a twiggy platform, with shallow cup lined with finer material, often placed in shrubby cholla cactus (*Opuntia*), usually at or below 1·5 m; sites more varied in S, including mesquite (*Prosopis*) or other thorny shrub, or small tree, average height above ground 3 m. Clutch size 2–3, occasionally 4, average lower in S (nominate race), eggs pale greenish-white to blue-green with dense purplish and dark to lighter brown spots; no information on incubation and fledging periods.

Movements. Resident.

Status and Conservation. Not globally threatened. Relatively common in suitable habitat throughout range, including on two largest islands in S Sea of Cortés (San José, Cerralvo). Habitat clearance in coastal strip of NW peninsula has been dramatic in last two decades; effects of this, if any, on this species not known.

Bibliography. Anon. (1998b), Bancroft (1930), Bent (1948), Blake (1953), Brewer (2001), Brewster (1902), Cody & Velarde (2002), Dunn & Garrett (1984), Grinnell (1928b), Hellmayr (1934), Howell & Webb (1995), Short & Banks (1965), Stotz *et al.* (1996), Wilbur (1987), Zink *et al.* (1999).

29. Bendire's Thrasher

Toxostoma bendirei

French: Moqueur de Bendire **German**: Kaktusspottdrossel **Spanish**: Cuitlacoche Piquicorto

Taxonomy. *Harporhynchus Bendirei* Coues, 1873, Tucson, Arizona, USA.

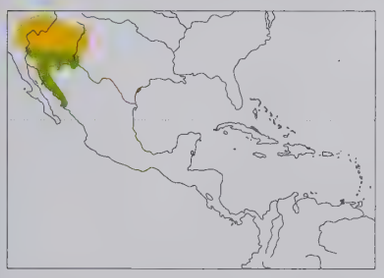
Thought most closely related to, and forming a superspecies with, *T. cinereum*. Validity of races has been questioned, as these based on plumage differences that may have a seasonal component (through wear). Three subspecies currently recognized.

Subspecies and Distribution.

T. b. bendirei (Coues, 1873) – breeds SE USA (S from SE California, S Nevada, S Utah and S Colorado) S to NW Mexico (N Sonora).

T. b. candidum van Rossem, 1942 – WC Sonora (Mexico).

T. b. rubricatum van Rossem, 1942 – interior S Sonora.



Descriptive notes. 23–25 cm; 60 g. Largish, long-tailed, long-legged mimid with rounded wings, bill slightly decurved and relatively short for genus. Nominate race is drab olive-brown above, ear-coverts paler and lightly streaked, wings and tail slightly darker than back, white markings on corners of outer retrices (more visible from below); throat whitish; underparts whitish-grey, tinged light brown, lightly marked with olive-brown spots, flanks and crissum buff; iris yellow; bill neutral grey, pale horn-coloured base; legs neutral grey. Sexes alike. Juvenile is similar to adult, but upperparts and wing and tail feathers fringed cinnamon-rufous. Race *candidum* is paler, ashy brown, above and whiter below than nominate; *rubricatum* is darker, more reddish, above, larger spots on breast. VOICE. One of the finest songsters, if not the best, of genus; song a loud, near-continuous string of sweet, fluty, warbled varied phrases, each usually repeated 2–4 times before changed; distinguished from songs of congeners (e.g. *T. crissale*, *T. curvirostre*, *T. lecontei*) by its sweet, melodious continuity and lack of harsh or strident notes, song continuity more like that of *Oreoscoptes montanus*; no mimicry reported. Calls single or repeated "chek" or "chup-chup-chup" notes; also a rising "shreee".

Habitat. Open desert scrub with scattered, taller trees, as in sagebrush (*Artemisia*) with scattered juniper (*Juniperus*), Mojave scrub with scattered Joshua trees (*Yucca brevifolia*); avoids denser vegetation in woodland and desert washes. Sea-level and lowlands; up to 1800 m in N of range (Utah).

Food and Feeding. Generalized omnivore; feeds on insects and other arthropods, and seeds and berries. Insects in diet include grasshoppers (Orthoptera), beetles (Coleoptera), ants (Hymenoptera), termites (Isoptera), lepidopteran larvae. Forages largely on ground; searches in ground litter by digging, probing with the bill; excavates hidden prey with bill. Berries taken from low bushes.

Breeding. Egg-laying in USA from late Mar–Apr in California, earlier in Arizona; two broods typical in S of range, possibly single-brooded in N. Monogamous; strongly territorial; territory 5–10 ha, and thus appears to be larger than in *T. curvirostre* and *T. lecontei*. Nest a twiggy but neat grass-lined open cup, less bulky than those of congeners, placed typically 1–1·5 m above ground in dense, often thorny shrub. Clutch 3 eggs, occasionally 4, speckled or blotched on white to pale blue-green background; no information on incubation period; chicks fed by both parents, nestling period c. 12 days.

Movements. Resident in S. Short-distance migrant in N, wintering within S half of breeding range, from S Arizona and New Mexico (USA) S in Mexico to Sonora; leaves breeding sites in California (Mojave Desert) in late Jul and early Aug, returning mid-Mar to May.

Status and Conservation. Not globally threatened. Rather uncommon; locally fairly common in Mexico. Opinions on present status equivocal; may benefit from overgrazing, which favours expansion of junipers, but other habitat alteration in desert habitats likely detrimental to the species. May be negatively affected by off-road vehicle traffic, suburban spread around desert cities such as Hermosillo (Sonora), and Phoenix and Tucson (Arizona), and certainly by large-scale mechanized agriculture, as in Gila Valley (Arizona). Currently listed as a "species of special concern" in California.

Bibliography. Ambrose (1963), Anon. (1998b), Baicich & Harrison (1997), Bent (1948), Brown (1901), Darling (1970), DeGraaf & Rappole (1995), Dunn & Garrett (1984), Emlen (1974), Engels (1940), England & Laudenslayer (1989a, 1989b, 1993), Gilman (1909, 1915), Hellmayr (1934), Howell & Webb (1995), Hubbard (1973), Kaufman (1996a), Kaufman & Bowers (1990), Laudenslayer *et al.* (1992), Mills (1992), Murphy & Fleischer (1986), Pierce (1921), Price *et al.* (1995), Reeves (1997), Righter (1997), Root (1988), Rosenberg *et al.* (1991), Small (1994), Stotz *et al.* (1996), Zink *et al.* (1999).

30. Ocellated Thrasher

Toxostoma ocellatum

French: Moqueur ocellé **German**: Tropfenspottdrossel **Spanish**: Cuitlacoche Ocelado

Taxonomy. *Harporhynchus ocellatus* P. L. Sclater, 1862, Oaxaca, SW Mexico.

Perhaps most closely related to, and forming a superspecies with, *T. curvirostre*; both similarly close to the *T. rufum* superspecies. Monotypic.

Distribution. SC Mexico, from Guanajuato S to near Isthmus of Tehuantepec (Oaxaca).



Descriptive notes. 26·5–29·5 cm; 77·7–88·9 g, average 84·3 g. Large, boldly marked thrasher with longish, decurved bill. Has pale supercilium, greyish-brown crown and upperparts, dark brown wings, rump and tail; upperwing-coverts pale-tipped (two narrow wingbars), outer rectrices tipped pale; throat white, obscure dark malar stripe; underparts whitish to pale buff, breast, belly and flanks boldly spotted black; iris dark reddish-brown to dark amber; bill and legs blackish-grey. Sexes similar, female slightly smaller than male. Juvenile has wing and tail markings buffier, underparts less distinctly spotted. VOICE. Song, from exposed brush-top perch (but drops to ground when approached), a long, discontinuous series of varied notes and phrases, with some repetition; similar in pace to that of *T. cinereum*, more brisk than songs of *T. redivivum* and *T. crissale*. Typical call a smacking "check" note.

Habitat. Scrub, woodland edge, understorey scrub in open pine–oak (*Pinus–Quercus*) woodland, scrub–oak (e.g. México, 2300 m). In Oaxaca, found in dense, chaparral-like brush at 1400 m, extending upslope to 2000 m in brushy gulleys and understorey in oak woodland. Highlands from 1400 m, locally to 3000 m. At higher elevations and in less open habitats than *T. curvirostre*.

Food and Feeding. No details on diet; probably ground and leaf-litter arthropods. Forages largely on ground in dense cover. Rather elusive, difficult to observe.

Breeding. Little information available. Nest bulky, of twigs and grass, located low in dense cover. Clutch 2 eggs, greenish-blue, spotted and daubed with reddish and brown markings.

Movements. Apparently resident on or near territory; observed in same locations in Oaxaca from Mar to Sept.

Status and Conservation. Not globally threatened. Uncommon throughout range; rare in S (Oaxaca); possibly overlooked owing to its retiring habits and difficulty of observation. Reasonably predictable in appropriate habitat.

Bibliography. Anon. (1998b), Binford (1989), Blake (1953), Brewer (2001), Forcey (2002), Hellmayr (1934), Howell (1999), Howell & Webb (1995), Hunn *et al.* (2001), Rojas-Soto *et al.* (2001), Stotz *et al.* (1996), Zink *et al.* (1999).

31. Curve-billed Thrasher

Toxostoma curvirostre

French: Moqueur à bec courbe **Spanish**: Cuitlacoche Piquicurvo
German: Krummschnabel-Spottdrossel

Taxonomy. *Orpheus curvirostris* Swainson, 1827, Tableland of Mexico.

Perhaps most closely related to, and forming a superspecies with, *T. ocellatum*; both similarly close to the *T. rufum* superspecies. Races form two groups, E "nominate group" (also including *celsum* and *oberholseri*) and smaller and less distinctly marked taxa in W "*palmeri* group" (also including *maculatum*, *occidentale* and *insularum*); groups intergrade somewhat in SW USA (Arizona). Recent genetic studies suggest that the two groups may represent separate species. Several races (e.g. *insulararum*, *celsum*) poorly differentiated, perhaps not distinguishable. Seven subspecies currently recognized.

Subspecies and Distribution.

T. c. palmeri (Coues, 1872) – SW USA (SW & C Arizona) S to NW Mexico (S to C Sonora).

T. c. insularum van Rossem, 1930 – Tiburón I and San Estebán I, in Gulf of California off C Sonora coast (NW Mexico).

T. c. maculatum (Nelson, 1900) – NW Mexico (S Sonora, N Sinaloa, SW Chihuahua).

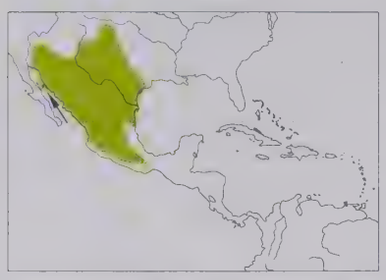
T. c. occidentale (Ridgway, 1882) – WC Mexico (Sinaloa S to Jalisco).

T. c. curvirostre (Swainson, 1827) – C & SC Mexico (S to Puebla and Oaxaca).

T. c. celsum R. T. Moore, 1941 – S USA (SE Colorado, SW Kansas and extreme NW Oklahoma S to SE Arizona, New Mexico and W Texas) and NC Mexico (S to Zacatecas).

T. c. oberholseri Law, 1928 – S Texas S to NE Mexico (S to SC Tamaulipas).

Descriptive notes. 25·5–28 cm; 67–90·5 g, average 79·4 g. Largish, grey-brown long-tailed desert thrasher with long, moderately decurved bill. Nominate race is light greyish-brown above, upperwing-coverts tipped paler (two inconspicuous wingbars); wings and tail browner, inconspicuous light tips on outer rectrices; chin and throat whitish, indistinct brownish malar stripe; breast buffy white, mottled with dusky brown, flanks and crissum cinnamon-buff; iris red or orange to yellow, with orange outer ring; bill blackish-brown; legs dark brown. Differs from *T. bendirei* in longer, more curved bill, and spots on breast larger, more rounded and less well defined. Sexes similar, female slightly smaller than male (c. 6% by weight in race *palmeri*). Juvenile is similar to adult, but rather less distinct wing and tail markings. Races differ mainly in size, and in conspicuousness of markings, W ones smaller and less well marked: *celsum* is very like nominate, but slightly larger, more buff below, tail tips whiter; *oberholseri* is more slaty above, with shorter



wings and tail; *palmeri* is smaller, more uniform below, less distinctly spotted, less white on tail; *insularum* is paler and greyer than previous, with better-defined spotting on breast; *occidentale* is larger, browner above, longer-tailed; *maculatum* is smaller and darker than last. Voice. Song a long series of varied phrases with distinct pauses; less continuous, more disconnected and harsher than songs of *T. bendirei* or *T. lecontei*, but faster and less harsh (fewer guttural notes) than more deliberate songs of *T. crissale* and *T. redivivum*. Call note a bright, sharp and emphatic "whit-whit"; other calls include scolding "chrrr", a "chuck-chuck" chatter. E "nominate group" of races known to mimic Scissor-tailed Flycatcher (*Tyrannus forficatus*) and Northern Cardinal (*Cardinalis cardinalis*) in Texas; no mimicry reported from W "*palmeri* group".

Habitat. Open desert with emergent trees and columnar cacti in Sonoran Desert, also lower scrubland in Chihuahuan Desert, bordering mesquite (*Prosopis*), acacia (*Acacia*) thorn-scrub, and taller, open woodland. Occupies lowest vegetation (c. 1 m tall) in Chihuahuan intermontane region, and tallest (6–8 m) in C Mexican thorn-scrub and deciduous woodland edge. Also well-vegetated gardens.

Food and Feeding. Diet insects, especially beetles (Coleoptera), and other arthropods, also flowers and fruits of various shrubs; cactus fruits important item in diet. Nestling diet insects, some fruit. Forages on ground in open, as well as under shrubs; digs energetically with the bill in accumulated litter, excavates shallow holes, displaces vegetable material with vigorous bill flicks. Ascends vegetation to exploit flowers and fruits.

Breeding. Breeds Feb to early Aug, season may shift later with sparse winter rainfall; two broods usual. Monogamous. Territorial, remains in territory throughout year, likely over successive years if both partners survive; other thrashers (*T. bendirei*, *T. crissale*, *T. lecontei*, *T. longirostre*) tolerated in territory, but some agonistic interactions around nest-site; territory size 2–4·5 ha. Nest a twiggy cup lined with finer material, placed 1–2 m above ground in shrub, preferably in cholla cactus (*Opuntia*) where available; same shrub, and often old nest, utilized in successive broods and years. Clutch size 2–4, average higher in Texas brushland (3·8) than in Sonoran Desert (3·2 in SE Arizona, 2·8 in N Mexico); eggs bluish-green, densely spotted with reddish-brown; incubation by both sexes, predominantly by female, period 12–15 days, usually 14 days; hatching asynchronous, brood reduced in times of low food availability; chicks fed by both parents, more by female, nestling period c. 15 days; young independent and capable of strong flight after 40 days; male may continue to feed fledglings of first brood after female begins second clutch.

Movements. Resident; some local population shifts may occur, probably dependent on habitat and food availability.

Status and Conservation. Not globally threatened. Widespread and common. Main threat is loss of habitat through clearing for agriculture or suburban development, although this species is reasonably tolerant of well-vegetated gardens in suburbia. Degradation of desert vegetation by all-terrain vehicles (ATVs) also an adverse factor.

Bibliography. Anon. (1998b), Ault (1984), Baicich & Harrison (1997), Bent (1948), Binford (1989), Darling (1970), Dunn & Garrett (1984), Edwards & Stacy (1968), Emlen (1974), Emlen & Ogden (1985), Fischer (1980, 1981a, 1983), Gilman (1909), Hellmayr (1934), Howell & Webb (1995), Hubbard (1973), Johnsgard (1979), Kaufman (1996a), Kaufman & Bowers (1990), Koes (1999), Murphy & Fleischer (1986), Newlon (1981), Omland (2001), Pfister (1984), Price *et al.* (1995), Rand (1941), Ricklefs (1965, 1966), Rojas-Soto (2003), Root (1988), Rowley (1984), Rylander (1981), Schwilling (1980), Shackford (1989), Small (1994), Smith (1971), Stafford (1912), Stotz *et al.* (1996), Tweit (1996), Tweit & Tweit (1992), Vleck (1984), Walters & Lamm (1986), Woodward (1969), Zink & Blackwell-Rago (2000), Zink, Dittman *et al.* (1999), Zink, Kessen *et al.* (2001).

32. Le Conte's Thrasher

Toxostoma lecontei

French: Moqueur de Le Conte **German**: Wüstenspottdrossel **Spanish**: Cuitlacoche Pálido

Taxonomy. *Toxostoma Le Contei* Lawrence, 1851, Fort Yuma, Arizona, USA.

Closely related to *T. redivivum* and *T. crissale*, and possibly part of same superspecies. Has been suggested that race *arenicola* is a separate species. Proposed race *macmillanorum* (San Joaquin Valley, in California) exhibits only minor plumage differences (e.g. crown darker, flanks lighter) from similarly sized nominate; considered better merged with latter. Two subspecies currently recognized.

Subspecies and Distribution.

T. l. lecontei Lawrence, 1851 – SW USA (SC & SE California E to SW Utah and SC Arizona), S to NW Mexico (NE Baja California, NW Sonora).

T. l. arenicola (Anthony, 1897) – W coast of C Baja California.



Descriptive notes. 24–28 cm; 54·5–75·5 g, average 61·9 g. Smallest of the mainland *Toxostoma* thrashers, with short, rounded wings, long dark tail, long and decurved bill. Has dark-speckled lores, uniform plain grey crown and upperparts, browner uppertail-coverts, wings darker than back; contrasting blackish tail, outer feathers pale-tipped; chin and throat white, submoustachial stripe finely speckled brownish, malar stripe dusky brown; underparts plain brownish-grey, belly buff, contrasting crissum deeper buff; plumage browner after late-summer moult; iris deep chestnut-brown; bill black; legs very dark horn-coloured. Differs from *T. redivivum* and *T. crissale* in smaller size, much greyer plumage. Sexes alike. Juvenile is paler, buffier than adult, legs paler, bill shorter (adult length after 6–7 weeks). Race *arenicola* is darker and shorter-tailed than nominate. Voice. Song a long series of closely connected phrases with some repetition, but great variety; higher-pitched, less deliberate, more continuous than that of *T. curvirostre* and, especially, *T. crissale*, less melodious than that of *T. bendirei*. Female sings occasionally. Typical call an upslurred "chreeep" or "chureep"; distress call a rolling "brrt-wrrt".

Habitat. Low and open desert scrub dominated by shrubby cholla cacti (*Opuntia*) less than 2 m tall, yuccas (*Yucca*), and wide variety of other shrubs no more than c 1 m in height; habitat in Sonoran Desert (SW Arizona, NW Sonora, NE Baja California) has scattered taller trees and cacti. In WC Baja California (race *arenicola*) occupies coastal plains of low, knee-high scattered shrubs, similar to habitat utilized in USA by nominate in San Joaquin Valley (SC California).

Food and Feeding. Food mainly insects, including beetles (Coleoptera), grasshoppers (Orthoptera) and ants (Hymenoptera); also other arthropods, e.g. spiders (Araneae) and scorpions (Scorpiones). Diet may contain up to 10% plant material, chiefly small seeds found at or near ground level, of annuals or fallen seeds from shrubs. Nestling diet initially small arthropods, later larger ones. Feeds mostly on ground arthropods in litter around and under desert shrubs. Forages by vigorous deployment of bill, excavating in litter beneath shrubs, flicking aside fallen plant material in search of items.

Breeding. Breeds in desert spring, Mar–May, earlier in Colorado Valley; likely two broods over most of range, possibly single-brooded in N areas of Mojave Desert. Monogamous. Strongly territorial, occupies same area, if not same specific territory, in successive years, but territoriality relaxed after breeding completed; often near territories of congeners but no interspecific interactions recorded, mild agonistic interactions with *Mimus polyglottos* reported; territory 4–10 ha. Nest built by both sexes, an outer shell of stout twigs lined with finer fibres, rootlets, grasses, placed in dense shrub, normally 1–1·5 m high in Mojave Desert, where shrubby diamond cholla (*Opuntia ramosissima*) preferred. Clutch 2–5 eggs, average 3·3, clutch size significantly larger in mid-season, also in Mojave Desert and San Joaquin Valley; eggs greenish-blue with brown to purplish spots and blotches, often heavier at large end, occasionally unmarked; incubation by both sexes, predominantly by female, period 14–19 days (average 15·8 days); chicks fed by both parents, predominantly by male, nestling period c. 15 days, may be extended during inclement weather; young fed by parents, especially male, for 2 weeks or more after leaving nest, but become more active foragers and dig for own food after 1 week; juveniles may associate and roost together in vicinity of natal territory until end of summer.

Movements. Resident on or near territory throughout year; young disperse locally over a few km.

Status and Conservation. Not globally threatened. Not common anywhere in range. Rather low densities, several pairs/km² in good habitat. Numbers reduced through agricultural development in larger river valleys, as in Arizona (Gila Valley, Salt Valley) and California (valleys of Imperial, Coachella and San Joaquin); also by suburban development around desert cities, and by habitat degradation through clearing, grazing, and activity of all-terrain vehicles (ATVs). In USA, designated a "species of special concern" in California; currently considered a candidate species for "Endangered" or "Threatened" status by USFWS.

Bibliography. Anon. (1998b), Baicich & Harrison (1997), Bent (1948), Engels (1940), Gilman (1904, 1909, 1915), Grinnell (1933), Hanna (1933b), Hellmayr (1934), Howell & Webb (1995), Hubbard (1973), Kaufman (1996a, 2003), Laudenslayer *et al.* (1992), Murphy & Fleischer (1986), Pemberton (1916), Price *et al.* (1995), Sheppard (1970, 1973, 1996), Small (1994), Stotz *et al.* (1996), Zink, Blackwell-Rago & Rojas-Soto (1997), Zink, Dittman *et al.* (1999).

33. California Thrasher

Toxostoma redivivum

French: Moqueur de Californie **Spanish**: Cuitlacoche Californiano
German: Kalifornienspottdrossel

Taxonomy. *Harpes rediviva* Gambel, 1845, Monterey, California, USA.

Forms a superspecies with *T. crissale*, possibly also including *T. lecontei*. Two subspecies recognized.

Subspecies and Distribution.

T. r. sonomae Grinnell, 1915 – SW USA (N California).

T. r. redivivum (Gambel, 1845) – S California and NW Mexico (NW Baja California).



Descriptive notes. 28–32 cm; 78–93 g, average 84·4 g. Largest member of genus; plain and brownish with long legs, long, downcurved bill. Nominate race has buffy-brown head with lighter flecks at side, distinct greyish-buff supercilium; upperparts deep greyish-brown, richer brownish-olive on uppertail-coverts and tail; upperwing-coverts and primaries margined greyish-brown; chin and throat greyish-white to buff, indistinct thin brownish-olive malar stripe; greyish below, darker on flanks, breast creamy to cinnamon-buff or buffy grey, often buffier on central breast, belly creamy to cinnamon-buff becoming deeper tawny-brown on crissum, and duller buff to greyish-brown on flanks, darker towards rear; plumage duller before late-summer moult; iris brown; bill black; legs brown to blackish. Distinguished from *T. crissale* by slightly larger size, pale supercilium, less dark crissum. Sexes alike. Juvenile is similar to adult but duller, with fewer contrasts, breast more brown than cream, crissum less tawny, face unflecked. Race *sonomae* is somewhat larger, browner above and darker-bellied than nominate. Voice. Bold, bright, exuberant series of harsh and varied, mellower phrases, given singly or repeated two or more times, in steady measured but disjointed cadence. Fine mimic of many other species that share habitat. Typical call a loud, ringing and far-carrying "churreep"; also softer "shtupp" call and harsh "chack" or "chock" alarm.

Habitat. Typical habitat chaparral; extends at lower densities to adjacent coastal areas of sagebrush (*Artemisia*) scrub, oak (*Quercus*) woodland with scrubby undergrowth, and on inland foothill slopes to desert edge in scrubby juniper (*Juniperus*), piñon pine (*Pinus*) and Joshua tree (*Yucca brevifolia*) woodlands.

Food and Feeding. Feeds on large arthropods throughout year, nearly exclusively so in breeding season; depends heavily on fruits, mostly small and soft, late summer to late winter. Arthropods include ground-litter insects, especially beetles (Coleoptera), crickets (Orthoptera), hymenopterans (including ants) and lepidopteran larvae and pupae, also spiders (Araneae), millipedes (Diplopoda), isopods. Fruits taken from many chaparral shrubs, include those of poison-oak (*Rhus*) and elderberry (*Sambucus*), and of several other shrubs in families Rosaceae, Rhamnaceae and Solanaceae; occasionally larger, tougher fruits, such as acorns and walnuts (*Juglans*), opened by persistent hammering with the bill. Arthropods taken on ground, usually under cover of shrubs in deep leaf litter and debris; found by vigorously sweeping bill from side to side to displace litter, and by digging with bill in and under fallen branches and around trunk boles; runs swiftly, either between foraging sites or for cover. Sometimes raids gardens for domestic grapes, pomegranates, figs (*Ficus*), citrus, cactus fruits, or seeds at birdfeeders.

Breeding. Breeds early, from Feb–Mar, but earlier records reported, to at least mid-Jul; two broods. Monogamous. Strongly territorial throughout year, territories looser in late summer to autumn; both sexes share nearly equally in territory defence, aggressive toward nest predators such as West-

ern Scrub-jay (*Aphelocoma californica*) and Common Raven (*Corvus corax*), also towards potential competitors such as *Mimus polyglottos*; territory c. 1–2 ha in prime habitat, to 5 ha or more in marginal habitat (e.g. coastal sagebrush, piñon–oak–juniper woodland). Nest built by both sexes, a bulky platform of twigs, with cup lined with fine roots, grasses, dried forbs or other fibres, generally 1·5–3 m above ground in dense shrub. Clutch size 3–4, second clutches significantly larger (by average 0·29 eggs), eggs pale blue, variously dotted and blotched with fuscous to buff-brown to greyish markings, usually over most of surface, rarely unspotted; incubation by both sexes, period 14 days or slightly shorter; chicks fed by both parents; young leave nest after 14–17 days, capable of weak flight only, remain on territory and fed by parents for several weeks more; second clutch started often before young of first brood gain independence.

Movements. Resident; limited dispersal of young within a few km of natal site.

Status and Conservation. Not globally threatened. Restricted-range species: present in California EBA. Uncommon to locally common. Historically, suffered to some degree from use of pesticides in orchard and garden crops; loss of habitat, to agriculture or suburban development, a more significant factor. Predictably common in undisturbed, contiguous chaparral habitat, but disappears in fragments of less than 10 ha in extent. Preservation of habitat fragments with size greater than 20 ha should ensure persistence of the species.

Bibliography. Anon. (1998b), Baicich & Harrison (1997), Bent (1948), Bolger *et al.* (1991), Cody (1998), Cody & Mooney (1978), Davis (1952), Engels (1935, 1940), Grinnell (1917), Hanna (1936), Hellmayr (1934), Howell & Webb (1995), Kaufman (1996a, 2003), Laudenslayer *et al.* (1992), Murphy & Fleischer (1986), Oberholser (1918), Price *et al.* (1995), Root (1988), Sargent (1940), Sgariglia & Burns (2003), Small (1994), Stotz *et al.* (1996), Woods (1939), Zink *et al.* (1999).

34. Crissal Thrasher

Toxostoma crissale

French: Moqueur cul-roux **German**: Rotsteiß-Spottdrossel **Spanish**: Cuitlacoche Culirrojo

Taxonomy. *Toxostoma crissalis* Henry, 1858, New Mexico, USA.

Specific name previously given as *dorsale*, but that apparently a printer's error in original description; now suppressed in favour of present name, which was the one intended by describer. Forms a superspecies with *T. redivivum*, possibly also including *T. lecontei*. Races intergrade. Four subspecies recognized.

Subspecies and Distribution.

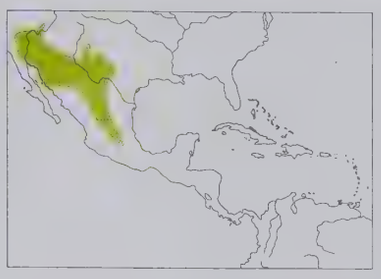
T. c. coloradense van Rossem, 1946 – extreme SW USA (lower R Colorado in SE California and SW Arizona) S to NW Mexico (extreme NE Baja California, NW Sonora).

T. c. crissale Henry, 1858 – SW USA (SW Utah S to SE California and S Arizona, also New Mexico and W Texas) S to NC Mexico (S to WC Coahuila).

T. c. trinitatis Grinnell, 1927 – Valle de Trindad (NE Baja California) in NW Mexico.

T. c. dumosum R. T. Moore, 1941 – C Mexico (E Durango and S Coahuila S to Hidalgo).

Descriptive notes. 26·5–30·5 cm; 61–75 g, average 63 g. Large greyish mimid with long tail, long legs, long and strongly downcurved bill. Nominate race has blackish lores, contrasting white submoustachial stripe; greyish-brown above, cheeks and ear-coverts buffy brown, flecked whitish, wings and tail somewhat darker than back, tips of outer retrices paler buffy brown (more visible from below); throat and chin whitish, contrasting blackish malar stripe; underparts similar in colour to upperparts but paler, crissum rich chestnut-brown (rather conspicuous); plumage brighter after late-summer moult; iris brown to straw-coloured; bill and legs blackish. Distinguished from similar *T. redivivum* by head pattern and underpart coloration. Sexes alike, female on average



slightly smaller than male. Juvenile is generally paler, duller, more rusty brown on wing-coverts and tail-coverts, iris initially grey. Races differ slightly in size and plumage tone: *trinitatis* is darker than nominate, greyer above and below, wing and tail darker; *coloradense* is paler than nominate above and below, slightly larger; *dumosum* is smaller than nominate, and much darker, especially on crissum. Voice. Song a sweet, strong, melodious, near-continuous string of varied phrases, with relatively little repetition; smoother and less discontinuous, and with fewer staccatto notes, than that of *T. redivivum*; rarely mimics other species. Call note distinctive, far-reaching "choit" or doubled "choidle-choit".

Habitat. Inhabits dense, low scrubby vegetation in desert washes and drainage channels; scrubby mesquite–juniper (*Prosopis–Juniperus*) brush in foothills adjacent to desert lowlands; scrub understorey of open pine–oak (*Pinus–Quercus*) woodland. From near sea-level up to 2500 m; mostly in uplands.

Food and Feeding. Largely insectivorous; minor amounts of seeds and berries taken outside breeding season. Insect prey mainly beetles (Coleoptera), ants (Hymenoptera), crickets and grasshoppers (Orthoptera), lepidopteran and dipteran larvae. Feeds on ground; forages for insects under bushes, rarely in open; searches leaf litter displaced by sweeping bill from side to side; digs, picks and probes with bill. Fruits and berries taken from low bushes such as boxthorns (Rhamnaceae) and sumacs (Anacardiaceae).

Breeding. Egg-laying from Feb–Mar in lower deserts, Apr in higher deserts; two broods typical in Sonoran Desert, likely single-brooded in N range (Mojave Desert). Monogamous. Strongly territorial throughout year, territory may overlap or abut those of congeners (*T. lecontei*, *T. curvirostre*, *T. bendirei*) and of *Mimus*, but no interspecific interactions reported; territory generally in range 4–7 ha. Nest an open cup of twigs, lined with grass, rootlets and feathers, not bulky, placed typically c. 1 m above ground in dense shrub, higher (to 2·5 m) in taller mesquite vegetation; may be reused by same pair or by other species. Clutch 2–3 eggs, occasionally 1 or 4, glaucous blue to pale blue and unspotted (unlike those of congeners); incubation by both sexes, period reported as 14 days; chicks fed by both parents, leave nest after 11–16 days, legs then well developed but bill and wings short; fed by parents for several further weeks, may remain on parental territory until next breeding effort (up to 10 months).

Movements. Resident; some populations may make local post-breeding movements to lower elevations.

Status and Conservation. Not globally threatened. Nowhere common, but reliably found in preferred habitats; easily overlooked, calls often the only clue to its presence. May be negatively affected by grazing, off-road vehicle traffic, various desert developments; certainly by large-scale mechanized agriculture, as in Gila Valley (Arizona). May have been favoured by spread of alien salt-cedar in valleys of Colorado and Pecos (New Mexico–Texas). In USA, currently classified as a "species of special concern" in California.

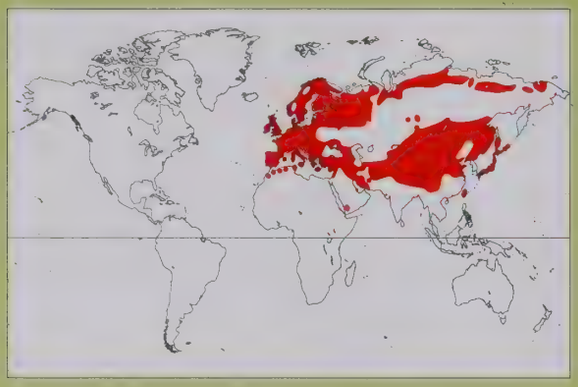
Bibliography. Anderson *et al.* (1998), Anon. (1998b), Austin (1970), Baicich & Harrison (1997), Bent (1948), Cody (1999), Finch (1982), Gilman (1902, 1909, 1915), Hanna (1933a), Hellmayr (1934), Howell & Webb (1995), Hubbard (1973, 1976), Kaufman (1996a, 2003), Kozma & Matthews (1997), Kozma *et al.* (1999), Laudenslayer *et al.* (1992), Murphy & Fleischer (1986), Oberholser (1920b), Price *et al.* (1995), Root (1988), Rosenberg *et al.* (1991), Small (1994), Stott & Sams (1959), Stotz *et al.* (1996), Zink *et al.* (1999).

Class AVES

Order PASSERIFORMES

Suborder OSCINES

Family PRUNELLIDAE (ACCENTORS)



- Small, mainly terrestrial birds with pointed bill, compact body and horizontal posture; mostly dark grey or brown, usually streaked, above, paler below.
- 14·5–18 cm.



- Eurasia.
- Largely montane, mainly in alpine or subalpine zone above tree-line, or montane forest or scrub; one widespread species also in lowland scrub and gardens.
- 1 genus, 13 species, 36 taxa.
- No species threatened; none extinct since 1600.

Systematics

The members of the family Prunellidae are distributed across the Palearctic Region, from Iberia and north Africa east to Japan, the greatest concentration of species being found in the mountainous regions of Central Asia. The remote montane distributions of most accentors mean that they have received little attention from ornithologists, but studies of the two most accessible species have revealed extraordinary breeding biology (see Breeding) that belies their rather unspectacular appearance.

Taxonomy within the Prunellidae is relatively straightforward, because all 13 species are classified in a single genus, *Prunella*. Their affinity to other oscine passerine groups, however, has for long been regarded as problematic. Early classifications, in the late 1800s, placed the accentors variously among the Old World warblers (Sylviidae), the finches (Fringillidae), the thrushes (Turdidae) or even the tits (Paridae). In the first half of the twentieth century, anatomical affinities were also noted with Old World flycatchers (Muscicapidae), wagtails (*Motacilla*), mockingbirds (Mimidae), wrens (Troglodytidae), babblers (Timaliidae) and dippers (Cinclidae), among others. The position of this enigmatic group is still not fully resolved. The shape of the bill and the associated jaw musculature suggest an affinity with the thrushes, but other features, such as the scutellated tarsus and the syringeal musculature, differ from those of Turdidae. An affiliation to the finches and the buntings (Emberizidae) may be signalled by the possession of a crop, a muscular gizzard and an operculum over the nostril, but these similarities could be a consequence of convergent evolution, rather than of shared ancestry. Analysis of egg-white proteins suggests that the accentors are most closely related to the Sylviidae and the Muscicapidae, but this is contradicted by evidence from DNA–DNA hybridization of Dunnocks (*Prunella modularis*) with other oscine passerines. This phylogeny positions the accentors close to the sparrows (Passeridae), the weavers (Ploceidae), the waxbills (Estrildidae) and the wagtails and pipits (Motacillidae); together, these are grouped within a superfamily Fringilloidea.

The placing of all accentors in the one genus reflects the general uniformity in their structure and appearance. Nevertheless, there are some constant differences in appearance and habitat among groups of species. The Alpine Accentor (*Prunella collaris*) and the Altai Accentor (*Prunella himalayana*) are relatively large prunellids, 25–45 g in weight, that breed at high elevation, usually well above the tree-line, although they may descend to lower altitudes in winter. These two species were once thought to be sufficiently distinct as to warrant their own genus, *Laiscopus*, but all recent works have placed them in the genus *Prunella*. The "dunnock group", comprising the Dunnock, the Japanese Accentor (*Prunella rubida*) and the Maroon-backed Accentor (*Prunella immaculata*), are smaller, weighing about 20 g, have no strongly contrasting markings, and are usually found in scrub or forest habitats. The third group contains six species: the Siberian Accentor (*Prunella montanella*), the Black-throated Accentor (*Prunella atrogularis*), the Brown Accentor (*Prunella fulvescens*), the Mongolian Accentor (*Prunella koslowi*), Radde's Accentor (*Prunella ocularis*) and the Yemen Accentor (*Prunella fagani*). All are of similar size to the members of the "dunnock group", with a weight range of 17–22 g, and most have a pale supercilium and some dark markings around the crown, cheeks or throat. Radde's Accentor was once regarded as a subspecies of the Brown Accentor, and the Yemen Accentor as a subspecies of Radde's Accentor, but it is now generally agreed that each warrants full species status. These six prunellids inhabit mountainous regions from Yemen to China or are found at high latitudes along the northern limits of Siberian coniferous forest.

The two remaining members of the family, the Robin Accentor (*Prunella rubeculoides*) and the Rufous-breasted Accentor (*Prunella strophiata*), do not appear to have any close affinities, although the latter possesses the striking head pattern characteristic of the previous species group.

Morphological Aspects

The general morphology and appearance of accentors reflect their terrestrial habits and omnivorous diet. The body is compact, with a short neck, and the tail, comprising twelve feathers, is generally of moderate length, although the Alpine and Altai Accentors have a rather short tail. The legs are fairly short, and the usual gait is hopping or a shuffling walk, often with bent legs, giving the appearance of crouching. Accentors will also run over short distances, particularly when chasing prey. The tarsus is scutellated in front and smooth behind; the toes are strong, and the claw on the hind toe is the longest.

Many flights made by accentors are short, rapid and close to the ground, which is hardly surprising in view of the skulking, ground-dwelling habits of the family. Nevertheless, the flight is strong, and species such as the Alpine Accentor may undertake

long undulating flights, particularly when living in flocks outside the breeding season. The wing shape varies across species, from being short and rounded to being fairly long and pointed. In the case of such species as the Black-throated Accentor and the Dunnock, subspecies that are migratory have wings that tend to be more pointed than those of sedentary races.

The bill is adapted for gleaning insects and seeds from vegetation and the ground, and its peculiar morphology is the principal cause of the controversy over the systematic position of the family (see Systematics). It is of medium length and tapers to a point from a laterally wide base; the basal width is especially noticeable in the Altai and Alpine Accentors. The bill is brown or black, but in the two aforementioned species the basal portion is yellow, particularly on the lower mandible. The nostril is covered by an operculum and is free from feathering.

Accentors are predominantly brown or grey, with a variable amount of streaking, on the upper side. The underside is generally rather uniform in colour, although several species also have patches of rufous or ochre coloration, particularly on the breast and flanks; these feathers may have pale margins, producing an impression of scales. This cryptic coloration often makes accentors difficult to locate in their typical scrubby or rocky habitats. The patterning of the head and neck is the most striking feature of many members of the family. Altai and Alpine Accentors have a white chin and throat bordered by black dots, in the latter case with black speckling that can produce the appearance of barring. Several of the smaller prunellids have a prominent white or buff supercilium, contrasting with black or dark brown markings on the crown, ear-coverts or throat. Some of these species bear a close resemblance to each other, perhaps indicating recent divergence as a result of geographical isolation.

The sexes are very similar, and often indistinguishable in the field. This is despite the intense reproductive competition that exists among both sexes of at least two species (see Breeding), and which might have been expected to result in the evolution of sexually selected plumage dimorphism, as it has in many other avian taxa. The juvenile plumage is similar to that of adults, although the underparts are usually strongly streaked and any patterning of the head is less distinct.

A prominent morphological adaptation of at least two accentor species results from their extraordinary mating systems (see Breeding). In Dunnocks and Alpine Accentors, the cloacal structure of both sexes exhibits spectacular modification, in the case of the female for the advertising of fertility and in the male for the storage of sperm prior to insemination. The cloaca of the female Alpine Accentor appears unremarkable when the bird is at rest, but during the pre-copulatory display (see Breeding) she presents to males a partially everted, bright red, vascularized cloaca that can be easily seen by a human observer. Female Dunnocks have a similar display, although the colour of the cloaca is far less intense.

Male morphological adaptations for sperm competition are equally dramatic. Alpine Accentor testes constitute an astonishing 8% of the body weight during the breeding season. In passerines, prior to insemination, sperm are stored in the seminal glomera, adjacent to the cloaca, producing a cloacal protuberance that varies in size according to the level of sperm production. The Alpine Accentor, with a body length of some 18 cm, has a bulbous cloacal protuberance 16 mm in diameter, which is probably larger, in relation to body size, than that of any other bird species. The Dunnock's testes are also relatively large, about 3·4% of the body weight, 64% larger than expected for a bird of its size, and males of this species also have a large cloacal protuberance during the breeding season. As with so many other aspects of their biology, no information is available on the cloacal morphology of other members of the family.

Adult accentors have a single complete annual moult in the late summer or autumn, following the end of breeding. The moult of the Dunnock starts with the primary feathers and lasts for about two months. In the case of other accentors, limited evidence suggests a more rapid moult. This might be expected in view of the fact that these species generally live at higher altitude and are therefore likely to experience more severe time constraints on breeding and moulting prior to the onset of migration or adverse environmental conditions. Juveniles undergo a partial moult, including the head and body feathers, some wing-coverts and, in some species, the tertials and the tail feathers.

Habitat

The accentors occur almost exclusively within the Palearctic Region, where they are predominantly birds of montane zones at middle to high latitudes. The Alpine Accentor has the widest distribution within this region, occurring from western Europe and north Africa eastwards to as far as Japan. Since this species breeds in the alpine zone of mountains, at an approximate elevational range of 1800 m to 5000 m, its distribution is patchy, resulting in



The morphology of all thirteen species constituting the accentor family is homogenous enough to enable them to be combined in a single genus. Within this assemblage, however, several distinct subgroups can be identified. The largest of these, containing six species distributed from Yemen to Japan, is characterized by strong head-patterns, usually involving some combination of dark crown, cheeks and throat; the ***Siberian Accentor*** *is a classic example. At first glance, members of this group resemble some* Emberiza *buntings, but the bill is tapered from a broad base to a pointed tip, a feature unique to* Prunella.

[*Prunella montanella*, Isikawa, Japan. Photo: Hirozo Maki]

the evolution of many subspecies; nine are usually recognized. At the other extreme, the monotypic Yemen Accentor has a very restricted range, confined to the mountains of Yemen, in the south-west corner of the Arabian Peninsula. The Dunnock is the most catholic member of the family, being found in a variety of montane and lowland habitats from subarctic regions of Scandinavia and Russia southwards to the Mediterranean, and breeding from sea-level up to 2000 m and above. The ranges of many of the other species are poorly known. For example, the southern extension of the Siberian Accentor's breeding range, through southern Siberia to the Altai Mountains, could be continuous rather than patchy; further fieldwork in this rather difficult terrain is desirable. Information on the range of the Mongolian Accentor in Mongolia and north-central China is particularly sparse.

Broadly speaking, the Prunellidae can be grouped into those that breed mainly above the tree-line in the alpine/subalpine zones, or in barren montane regions with scrubby vegetation, and those that breed in thicker scrub and woodland below the tree-line. The first group consists of the Alpine, Altai, Robin, Rufous-breasted, Brown, Mongolian, Radde's and Yemen Accentors, while the Dunnock and the Siberian, Black-throated, Japanese and Maroon-backed Accentors belong to the second group. The Maroon-backed Accentor from the eastern Himalayas and China is unusual within the family in that it exhibits a preference for damp areas deep in coniferous forest.

The Dunnock is the only accentor that has expanded into lowland temperate habitats. In the northern and eastern parts of the its range, it is still found in the dense scrub habitats of alpine and arctic regions, where the species probably evolved. Elsewhere, however, Dunnocks are common birds of lowland woodland and farmland, and in parts of western Europe the extension has continued, making them one of the most abundant birds of parks and gardens. In Britain, this process of urbanization started at least 200 years ago, and perhaps much earlier. The only other prunellid species to breed at such low altitudes are the Siberian Accentor, which extends into subarctic taiga habitats, and the Alpine Accentor, which is reported as breeding on sea cliffs on the Russian coast of the Sea of Japan.

Non-breeding habitats occupied by the Prunellidae are less easily defined. As a result of the absence of dietary specialization within the family, and because of the capacity of its members to switch from a diet dominated by invertebrates to one dominated by seeds (see Food and Feeding), accentors are able to exploit a wide range of habitats. All species for which sufficient information is available exhibit some degree of altitudinal migration (see Movements), although the extent of these movements is very variable within species, in some cases depending on environmental conditions; species such as the Brown Accentor and the Altai Accentor show a remarkable ability to overwinter in their breeding habitat, despite the severity of the winter at such high altitudes. For most accentors, the seasonal movement to lower elevations takes them to more heavily vegetated habitats and often brings them into cultivated areas, where they are commonly associated with villages and livestock.



Adult accentors are monomorphic, such that it is usually impossible to differentiate between males and females in the field. Juveniles, in turn, tend to be muted versions of adults, usually more heavily streaked on the underparts and less distinctly marked on the head, features that often accentuate their bunting-like appearance. As yet, this juvenile ***Rufous-breasted Accentor*** *lacks the strong head pattern and broad rufous chestband that it will acquire at the next moult. The distinctive traits of adults are much reduced, making it a little more difficult to identify.*

[*Prunella strophiata strophiata*, Mengbishan, Qinghai, China. Photo: Bernard van Elegem]

General Habits

Accentors can be characterized as unobtrusive birds. They are exclusively diurnal, but their mode of foraging, their preference for remote, often scrubby habitats and their cryptic coloration render them rather inconspicuous members of the Palearctic avifauna. Testament to this is the fact that, although accentors do not fit the typical passerine model of monogamous pairs living on exclusive territories (see Breeding), it is only since the 1980s that the extraordinary breeding systems of even the most familiar prunellids have been described in reasonable detail. Indeed, for many accentor species, basic information about their behaviour and breeding biology is partially or entirely lacking.

Although the nests of accentors are generally dispersed, this does not necessarily reflect a strict territorial system. The extent of territoriality differs sharply between, at one extreme, the large overlapping ranges of Alpine Accentors and, at the other, the smaller and strongly defended territories of Dunnocks (see Breeding), and it is difficult therefore to draw any general picture or to speculate about the less well-studied species. Nevertheless, anecdotal observations of Altai Accentors, Robin Accentors and Brown Accentors suggest a territorial system reminiscent of that of Alpine Accentors, while observations of Black-throated and Japanese Accentors suggest a territorial system more akin to that of Dunnocks.

Outside the breeding season, most accentors form flocks, sometimes with other bird species. The Brown Accentor, the Alpine Accentor and the Altai Accentor are the most gregarious of the family, the last of those three gathering in flocks of 100 or more individuals. The remaining species either collect in small parties or are encountered singly or in pairs. Dunnocks are essentially solitary outside the breeding season, although they may form temporary feeding aggregations, in which males are dominant over females.

Sun-bathing is a frequent activity, at least of Alpine Accentors and Dunnocks. This often entails the opening and raising of one wing in a characteristic posture. Interestingly, this is reminiscent of the "wing-waving" display that is frequently seen in the breeding season during agonistic interactions among males or among females in contests over territories. Interactions at territory boundaries also include song-duels among males and a display in which the feathers are fluffed up and the bill pointed downwards.

No information is available on the roosting behaviour of most accentors, but details are known for the two most-studied species. Dunnocks roost, usually in twos, 1–2 m above the ground in dense bushes or hedges, whereas Alpine Accentors roost in rock crevices, and sometimes communally during the winter.

Voice

Accentors are vocal birds, often having surprisingly loud and melodious songs and calls. Their songs can be broadly described as warbles composed of trills combined with clear notes, and sometimes with whistles or buzzing sounds. Each song is usually rather short, but songs are often delivered in bouts from a prominent position on the ground or in a bush or tree. Some species also sing in flight. One of the more remarkable features of the family is that, in the case of the Alpine Accentor and the Dunnock, the two species that have been studied in any detail, females produce complex songs of the type that is usually asso-



*The **Alpine Accentor** and Altai Accentor* (Prunella himalayana) *form a closely related species pair, distinguished from the rest of the genus by a suite of features. They have shorter tails than their congeners, and a pale yellow base to the bill, whereas in other prunellids both mandibles are uniformly black or brown. The flanks of these species are richly marked with rufous, and the throat is white, often speckled or barred with black in the Alpine Accentor. These differences prompted some earlier taxonomists to place these two species in a genus of their own,* Laiscopus, *but all recent treatments have included them within* Prunella. *Both are birds of high altitudes, their breeding ranges coinciding with major Eurasian mountain ranges. In many cases, habitats occupied during the breeding season are inhospitable in winter, when post-breeding flocks are driven downslope by harsh weather. Because of their need to cover large distances when foraging in barren terrain, as well as their seasonal migrations, the wings of these species are longer and more powerful than those of most other accentors.*

[*Prunella collaris collaris*, Sabiñánigo, Huesca, Spain. Photo: Javier Ara Cajal]

ciated with the function of mate attraction and territory defence by males. Studies by N. Langmore have shown that this behaviour is related to the unusual mating systems of these two species (see Breeding).

The song of the male Alpine Accentor is often produced in flight and bears a deceptive similarity to the song of the Eurasian Skylark (*Alauda arvensis*). It is characterized by a series of trills and ripples interspersed with fine, clear, fluty whistles, the whole making a strikingly rich verse that may last for 10 seconds or more. The female's song contains a lower diversity of elements, has a slower tempo and is more repetitive, features that make it easily distinguishable from the male's song in the field. Observations and experiments reveal that this unusual ability of females to sing has the function of advertising female fertility, and is a consequence of competition among females for the parental care offered by males (see Breeding). The complexity of a female's song increases with age, progressing from the simple multiple trills of yearlings to the complex songs containing several different syllables given by older females. As female reproductive success also increases with age, it appears that the song is a sexually selected signal to males that a female is fertile and of high quality and that males should, therefore, copulate with her.

With Dunnocks, the male's song is a rapid warble comprising trills and a number of sharply modulated units. It is shorter than that of the Alpine Accentor, and usually lasts for 1·5–3·5 seconds. Singing starts in early spring, continuing until the end of breeding, and throughout this period song-duels among males competing over territories and status are frequent. Individual male Dunnocks have large repertoires of song types that are formulated from a smaller repertoire of 10–15 constant song phrases. Males switch song types much more rapidly in the context of mate attraction than they do when singing spontaneously or when



*During the breeding season, the **Altai Accentor** frequents sparsely vegetated habitats at very high altitudes. It occupies the zone between the tree-line and the snow-line, favouring the bases of cliffs, barren slopes and rocky meadows, and tending to avoid more scrubby areas. Both this species and the closely related Alpine Accentor* (Prunella collaris) *range higher than almost any other passerine; the latter has been recorded up to 8000 m on the upper slopes of Mount Everest. In winter many individuals descend to more sheltered locales, including grassy meadows and valleys. The Altai Accentor ventures down to 1000 m, and the Alpine Accentor sometimes reaches sea-level.*

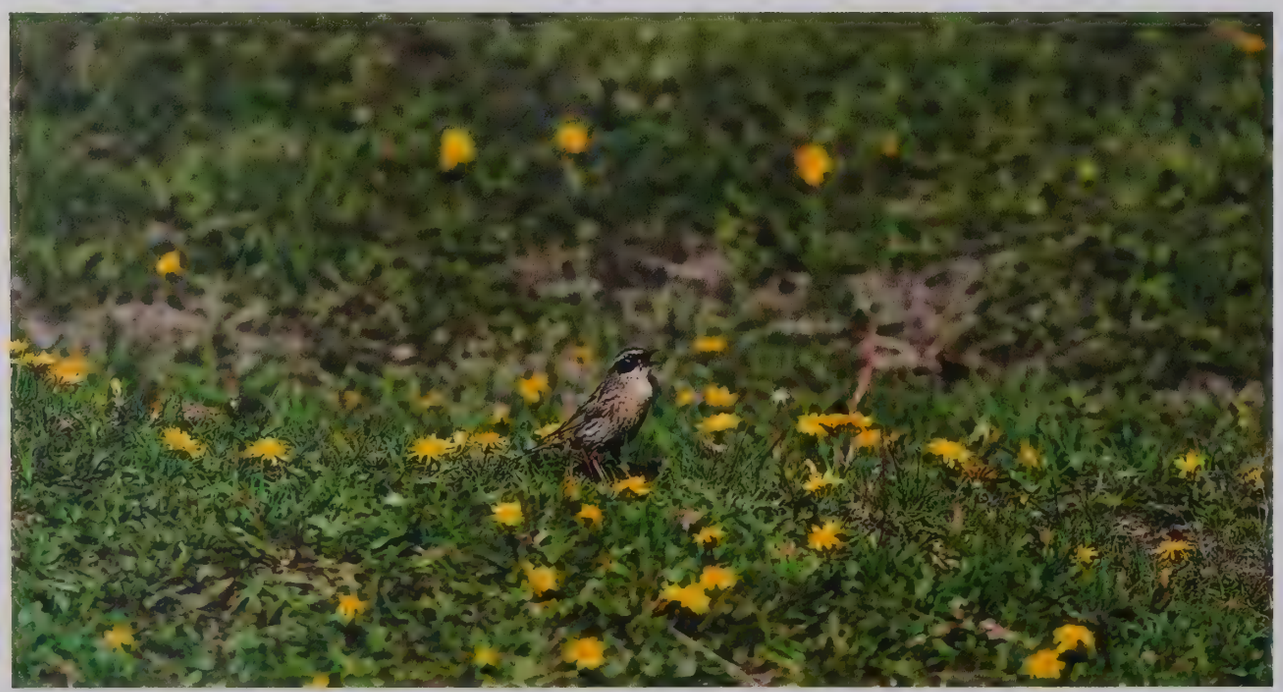
[*Prunella himalayana*, May-Saz, Kyrgyzstan. Photo: Hanne & Jens Eriksen]

involved in song-duels with other males; when advertising for a mate they change type every two songs, compared with every 20 songs in the latter situations. Experiments in which the songs of neighbouring males and those of same-territory males were played back to females have demonstrated that females can recognize individual males by their songs, and that female responsiveness is linked to their quest for copulations and, hence, for paternal care for their brood (see Breeding).

Female Dunnocks generally use simple "tseep" calls in territorial conflicts with other females, but, when left alone by the mate, they may use either trills or complex songs to attract his attention. The context for this unusual behaviour is very similar to that outlined above for female Alpine Accentors: song is a consequence of competition among females for the parental care provided by males. Not surprisingly, therefore, female song is more frequent when the competition for paternal care is greater; faecal analysis of androgen levels has shown that this facultative response to competition is regulated by a female's testosterone level.

The songs of Radde's, Siberian, Black-throated and Robin Accentors bear some similarity to that of the Dunnock, being sweet and melodious. The Brown Accentor also has a similar song, although this has been described, perhaps unfairly, as being "like a bad, slow robin [*Erithacus rubecula*]". The song of the Rufous-breasted Accentor has been likened to that of a Northern Wren (*Troglodytes troglodytes*), although more complex and without the latter's vehemence.

The main contact calls of the smaller accentor species are a simple monosyllabic or trisyllabic note, or a brief trill. The characteristic vocalization of the Altai and Alpine Accentors is a rippling or twittering call, usually given from the ground; it is often



***Radde's Accentor** is restricted to Asia Minor, where it usually breeds at 2000-3500 m above sea-level. At these altitudes much of the terrain is bare and rocky, but this species tends to occur where low scrubby vegetation provides a modicum of cover. It tends to be found in gulleys or sheltered slopes where a sparse growth of barberry* (Berberis), *juniper* (Juniperus) *or cedar* (Cedrus) *has taken hold. It spends much of its time hopping furtively and inconspicuously under this vegetation, but it sometimes emerges boldly onto adjacent turf, as this photograph attests.*

[*Prunella ocularis*, Aladag Mountains, Turkey. Photo: Hanne & Jens Eriksen]



With its pale eyes and richly coloured mantle, the ***Maroon-backed Accentor*** *looks slightly out of place in the family, and its habits are no less unusual. Although it occurs at high altitudes in the eastern Himalayas and the outlying ranges of southern China, it favours wooded habitats, often near water. It is especially fond of damp areas in ancient humid forests of conifers and rhododendrons, making it the most forest-based member of the family. In winter, it descends to lower altitudes, where it is most often encountered in secondary forests and forest margins.*

[*Prunella immaculata*, Jiuzhaigou, Sichuan, China. Photo: Bernard van Elegem]

difficult to locate, although this may be attributable to the terrain as much as being a property of the call. A loud chirruping flight call is often the first indicator of the presence of Alpine Accentors, particularly when the birds are associating in flocks outside the breeding season.

Young Alpine Accentors have loud begging calls, uttered both before and after fledging, that can frequently be heard at a considerable distance as they echo from rocks. This vocal begging by chicks is prompted by the calls of food-bearing adults as they approach the nest. The volume and intensity of begging calls would be expected to increase the vulnerability of nests to predators, but it has been argued that such loud vocalizations are related to this species' unusual mating system. Multiple paternity within a brood (see Breeding) reduces the degree of relatedness among the chicks, thereby increasing competitiveness and reducing the incentive for nestlings to avoid attracting predators.

Food and Feeding

During the breeding season, insects dominate the diet of all accentor species for which detailed information is available, but seeds are also an important element in the diet, particularly in winter. Species living at high altitude typically forage among rocks, stones, lichens, moss and grassy vegetation, often favouring the melting edge of snowfields. Those residing at lower elevations spend much of their time in foraging under cover of vegetation, thereby giving the appearance of being secretive, although the human observer can often approach them quite closely without causing alarm. Foraging prunellids move by walking or by making small hops, their progress being accompanied by almost ceaseless pecking movements; on occasion, they may also make aerial sallies to catch flying prey. The Rufous-breasted Accentor has been described as rodent-like because of its low shuffling manner of foraging, and Dunnocks also forage in this shuffling style.

The invertebrate diet includes virtually every order of insects that accentors are likely to encounter. It comprises, among others, springtails (Collembola), bristletails (Thysanura), two-tailed bristletails (Diplura), flies (Diptera), orthopterans, lepidopterans, bugs (Hemiptera), hymenopterans and beetles (Coleoptera), as well as other invertebrates such as spiders (Araneae), harvestmen (Opiliones), small snails and earthworms. The seeds of alpine plants are important constituents in the summer diet of most accentors that have been examined, and include those of the families Gramineae, Polygonaceae, Leguminosae, Rosaceae, Ranunculaceae, Primulaceae and Compositae. The plant component of the diet increases and becomes more diverse during the winter as the birds descend to lower altitudes and encounter the seeds of a greater diversity of plant taxa, especially trees such as Pinaceae, Cupressaceae and Betulaceae. Several species, including the Rufous-breasted Accentor and the Alpine Accentor, also take berries, among which those of heaths (Ericaceae), crowberry (*Empetrum*), bramble (*Rubus*), holly (*Ilex*) and even mistletoe (Loranthaceae) have been recorded.

Faecal analysis carried out on a population of Alpine Accentors in the Pyrenees, in south-west France, was revealing. In samples collected from adults during the breeding season, coleopterans and dipterans predominated, being found in, respectively, 92% and 70% of faeces; the next commonest groups were hymenopterans, with 19%, spiders, with 14%, and hemipterans, with 8%. These invertebrate taxa are dominant constituents of the "fallout fauna" that is deposited on mountain tops by the wind after having been swept up from lower altitudes. Very little plant material was recorded in the diet at this time of year, in June–August. It is noticeable that the adult accentors, when feeding young, are quick to exploit short-term gluts in food, such as those presented during brief periods when bibionid flies or grasshoppers (Acrididae) are superabundant. Dunnocks have a similar predominance of invertebrates in the diet during the breeding season, beetles being found most frequently, with spiders, flies, snails, lepidopterans and hemipterans also commonly represented. The proportion of the adult Dunnock's diet made up by invertebrates rises from 10% in February to 100% during breeding, and averages about 50% over the entire year.

The muscular gizzard and crop that characterize the Prunellidae (see Systematics) are clearly an adaptation to cope with this seed-dominated winter diet. The process of breakdown and digestion of seeds is further assisted by the consumption of grit, behaviour that has been observed for several members of the family. In Dunnocks, grit up to 2·2 mm in diameter has been recorded, and this material is taken particularly during the winter months, when the vegetable component of the diet is high.

Some accentor species are commonly found close to human habitation, especially in winter, and they exploit the feeding opportunities offered by this association, such as by feeding in barns



*Accentors are relatively unobtrusive birds, subdued in plumage and retiring in disposition. Many of the species, especially those confined to remote or inhospitable regions, remain essentially unstudied. On the basis of random photographs and anecdotes, however, it seems that all accentors are as fond of preening, sunbathing and bathing in water as are most passerines. This **Robin Accentor**, for example, is making good use of a mountain stream in Ladakh.*

[*Prunella rubeculoides*, Tso-Kar, Ladakh. Photo: Otto Pfister]

and close to livestock. In Europe, Alpine Accentors are sometimes observed at birdtables, where they take fat, bread and seeds. Dunnocks, too, frequently forage beneath birdtables, where they specialize on small bread crumbs that other birds ignore. They can often be seen as they pick up tiny items spilt on the ground, long after other bird species have left a feeding site.

For the Dunnock and the Brown, Black-throated, Altai and Alpine Accentors, the diet of nestlings has been quantified and been found to be similar to the summer diet of adults. Invertebrate prey are presented to the nestlings bill-to-bill, many items usually being delivered in a single load. Any seeds that are given to nestlings are regurgitated from the adult's crop.

Breeding

Breeding densities of accentors in alpine habitats may be surprisingly high, but few data exist for most of the species. Alpine Accentors reach densities of 26 individuals per km² in prime habitat in the French Pyrenees, and the Altai Accentor is described as a dominant member of the alpine avifauna in the Tien Shan Mountains of Central Asia. Perhaps commoner still is the Black-throated Accentor, for which a figure of 70 individuals per km² has been reported in juniper (*Juniperus*) scrub in the Tien Shan. The highest breeding density, however, is attained by the Dunnock. In Cambridge Botanic Garden, in England, as many as 640 breeding adults per km² were recorded, although the density is much lower, at 0·6–5 pairs per km², in the extensive forests in which the species probably originated.

The basic breeding biology of the Prunellidae, so far as details are known, shows little variation among the species. Most accentors appear to be double-brooded, although this has not been confirmed for several of them, including the Siberian Accentor, which may not even reach its breeding grounds until June. Nests are cup-shaped and are constructed from grass, moss, roots and similar material, with a lining of hair and other soft material. They are built by the female and are placed variously in rock crevices, on the ground, in low bushes or in trees. Females lay clutches of 2–5 clear blue or blue-green eggs, which they incubate for 10–15 days, and the nestlings are fed by both sexes for a further 10–15 days. The nestlings of all species for which information is available have an orange or red mouth with a distinct black spot on each side of the base of the tongue. All of these details are unexceptional. In contrast, studies of two species, the Dunnock and the Alpine Accentor, have revealed that every other aspect of their reproductive lives is quite extraordinary.

Research on the Dunnock, undertaken by N. B. Davies and colleagues in Cambridge, in England, has shown that this species has an exceptionally variable mating system. Within a single population, Dunnocks can be variously monogamous, polygynous, polyandrous or polygynandrous. In other words, one male defends the territory of a single female or defends the territories of two females, or two males share defence of one female's territory, or two or more males share defence of the territories of two or more females. This variability arises from variation in the males' ability to monopolize females, which, in turn, depends on the size of a female's territory. Polyandrous females have relatively large territories, the mean size being 0·55 ha; as these cannot be defended by a single male, a second male settles, often after a prolonged battle with the resident male. When female territories are small, a male may be able to defend two of them, thus becoming polygynous; in such cases, the mean female territory size was found to be 0·23 ha. Female territory size is determined by food resources; when Davies provided some females with extra food, these individuals reduced their territory size and were less likely to be polyandrous. It appears, therefore, that ecological factors determine female distribution, which, in turn, influences the dis-



*Accentors are vocal birds, often singing from prominent perches. Their songs, unremarkable in strength and melody, are often pleasant ditties composed of rapidly delivered whistles, chirps and trills. The most interesting feature of vocal behaviour in well-studied prunellids is not the song itself, but the fact that females are such accomplished singers. It is not known whether females sing to attract males in the **Japanese Accentor**, but given the complex breeding systems reported this seems likely to be the case.*

[*Prunella rubida*, Yamagata, Japan. Photo: Hirozo Maki]

tribution of males. It is interesting to note that similar variation in mating system has been recorded for a Finnish population of Dunnocks living at much lower density. So, the variability described here is not simply due to the fact that Dunnocks in Cambridge occur at high density in an artificial suburban environment.

The various mating combinations generate intense conflicts of interest within and between the sexes. When two males share a polyandrous or polygynandrous territory, they compete for copulations. Such males, incidentally, are never close relatives. One male, referred to as the "*alpha*" male, is dominant over the other, the "*beta*" male; the *alpha* male guards the fertile female and is sometimes able to monopolize copulations, in the same way as monogamous and polygynous males are. Nevertheless, *beta* males are extremely persistent and they are often able to copulate with fertile females. They are encouraged to do so by the female, which attempts to evade the guarding efforts of the *alpha* male in order to sneak away with the *beta* male. Mating is always preceded by a unique pre-copulatory display in which the female solicits, with her wings drooped and quivering, and her tail raised and vibrating rapidly from side to side. In response to this display, the male hops from side to side behind the female, pecking at her cloaca. The display lasts for about a minute, during which time the male pecks about 30 times. The female's pink and distended cloaca makes pumping movements, and she eventually ejects a drop of sperm from previous copulations. At this point, the two make cloacal contact for a fraction of a second and sperm is injected. This performance is repeated throughout a female's ten-day mating period. The likely function of the display is that it enables the male to increase the chance that his own sperm, rather than that of a rival male, reaches the site where the female stores sperm, thereby enhancing his chances of gaining paternity. Studies have shown that monogamous females mate 0·5 times per hour, while polyandrous females do so two times per hour.

The paternity of resulting broods is correlated with male mating success. Monogamous and polygynous males gain full paternity of broods, whereas, in polyandrous and polygynandrous systems, paternity is often shared between the *alpha* male and the *beta* male, the proportions reflecting the relative mating success of each. This explains the conflict among males. Females make particular efforts to copulate with both males because the extent to which males provision broods is closely related to their mating success and, hence, their paternity. This is important from a female's perspective: the more assistance she obtains from males, the lower is the rate of nestling starvation, so that brood sizes are then larger and the fledglings are in better condition. Conflict exists between females and *alpha* males because, on average, the extra young produced when a *beta* male helps in brood-rearing does not compensate the *alpha* male for the fact that he has lost some paternity of the brood to the *beta* male. Studies have shown that male breeding success increases with age, because older males are more likely than young males to achieve *alpha* status; the breeding success of females is not related to age.

The positive effect of male care on productivity also generates conflict among females. In polygyny and polygynandry, each female may receive less than the full-time care of a male; indeed, in some cases females receive no male help at all in rearing a brood. The result is that the rate of nestling starvation is high, and fewer chicks survive to fledging. This cost of shared paternal care causes females in polygynous and polygynandrous systems to attempt to disrupt the breeding attempts of other females which are rivals for the male's attentions. Escalated fights among females in such systems are frequent, and, even though males usually try to intervene and to separate the warring females, these disputes sometimes result in one female abandoning her breeding attempt. For the other female, competition for male care is thereby reduced.

These strategies, designed to maximize paternity, in the case of males, and paternal care, in the case of females, result in intense conflict between the sexes over the preferred mating system. A male does best in a polygynous system, because he is able to copulate with two females and thereby gain paternity of two broods. He fares least well in a polyandrous relationship, as he often has to share paternity of a single brood with the other male on the territory. Male productivity in monogamous and polygynandrous mating systems is intermediate between these two. In contrast, the female does best in polyandry, because, provided that she copulates with both males, both will help her to raise her offspring, and the number of fledglings produced increases as the amount of male care increases. Polygyny is the least desirable system for a female, as she often has to share the paternal care of one male with another female. Again, monogamy and polygynandry can be seen as a compromise between the interests of males and females, because, with these systems, productivity is intermediate and neither sex realizes its maximum potential reproductive success.

Studies of Alpine Accentors in the Japanese Alps, the French Pyrenees and the Swiss Alps have revealed that this species, too, has an unusual mating system. Polygynandrous groups of two to five males and two to five females occupy large, more or less ex-



The diet of high-altitude prunellids, such as the ***Brown Accentor****, is largely made up of insects during the breeding season. Their prey is captured either on the ground or in flight during brief aerial sallies. Needless to say, insects are available on a strictly seasonal basis in Asiatic mountains, and accentors are faced with three options in winter: to switch from insectivory to granivory; to migrate downhill; or both. The Brown Accentor is one of very few resident high-altitude prunellids, overcoming the constraints imposed by its environment through the strategy of eating insects in summer and seeds in winter.*

[*Prunella fulvescens fulvescens*, near Son Kul, Kyrgyzstan. Photo: Hanne & Jens Eriksen]



*The **Dunnock** is the only member of the family to have colonized temperate lowlands, and as a result it is familiar to most Europeans. It visits bird tables in winter, where it can be picked out from the brazen throng of sparrows* (Passer) *by its furtive demeanour, and the tiny hops by which it progresses when foraging. This odd shuffling gait is accompanied by almost constant pecking movements as the Dunnock works over the last scraps, picking tiny morsels from the ground.*

[*Prunella modularis*, Kerham village, Ploemeur, Morbihan, France Photo: Erwan Balanca/ Bios]

clusive ranges of about 20 ha of alpine habitat. Within a single group, the males have almost completely overlapping ranges, while female ranges tend to be somewhat smaller, although still showing extensive overlap with each other. As with Dunnocks, there is a dominance hierarchy among males and no evidence that relatedness plays any part in the association of either males or females. The behavioural dynamics within polygynandrous groups are very similar to those of Dunnocks: males compete to gain paternity, and females compete to gain paternal care for their offspring. Because of the larger group size of Alpine Accentors, however, competition among males and among females is even more intense than that observed with Dunnocks. These conflicts have two notable consequences. First, Alpine Accentors have an even higher copulation rate than that of Dunnocks; a female may copulate up to 1000 times for each clutch that she lays. Copulations are, again, preceded by a display, although males do not peck at the female's cloaca, and there may be several cloacal contacts during each copulation bout. Secondly, females compete with each other to attract males by producing complex songs during the fertile period and by exposing the scarlet cloaca to solicit copulations (see Morphological Aspects and Voice); as a result, a female may copulate with all the males in her group in the week prior to egg-laying.

Once the Alpine Accentor's eggs hatch, the nestlings are fed by the female and up to three males, the extent of an individual male's care being determined by his mating success and, consequently, his paternity of the brood. Unlike the situation with the Dunnock, the amount of male care does not affect the number of fledglings produced, but the young are in better condition the more paternal care they receive, and this is likely to influence their subsequent survival. The breeding success of both sexes of the Alpine Accentor increases with age. In the case of males, this is because older individuals are more likely to acquire dominant *alpha* male status, thereby gaining a greater share of paternity than that achieved by young males, while older females breed earlier and lay larger clutches than do younger ones.

The different mating systems of the Dunnock and the Alpine Accentor probably result from differences in food availability in their respective habitats. In the French Pyrenees, invertebrate abundance in Alpine Accentor habitat, at about 2200 m, was compared with that in Dunnock habitat, at about 1350 m. It was found that, at high altitude, invertebrates are less abundant and more patchily distributed in both time and space, presumably because of the more variable environmental conditions and the fact that much of the invertebrate fauna at high elevations is "fallout" from



*In summer, the **Alpine Accentor** subsists on an intake of insects, most of which are carried up to the montane zone by winds from lower altitudes. In winter, the focus switches to seeds and other plant matter, with insects only accounting for 10% of the diet. The small flocks which form at this time of year are a regular sight at some Alpine ski resorts, where they are attracted to scraps of food. When snow lies less than 5 cm deep, accentors are adept at digging their way to the ground in search of sustenance, but if conditions deteriorate they are forced downslope.*

[*Prunella collaris collaris*, Alta Ribagorça, Catalunya, Spain. Photo: Jordi Bas]





*Some accentors, including the **Robin Accentor**, perform a unique pre-copulatory display in which the female solicits with wings aquiver and tail raised. The male responds by repeatedly pecking her cloaca, from which she ejects a drop of sperm. Copulation ensues. It is no accident that this display has evolved in species with complex breeding systems, wherein more than one male has access to a fertile female. Males try to maximize paternity, and females try to convince multiple males that they fathered her brood. A visible ejection of sperm from previous matings thus benefits both parties.*

[*Prunella rubeculoides*, Sumdo, Ladakh. Photos: Otto Pfister]

the aerial plankton (see Food and Feeding). In order to exploit this patchy food resource, Alpine Accentors need very large ranges, which are not defendable by individual males or females. In contrast, the relatively predictable food supply at lower altitudes allows female Dunnocks to defend comparatively small, exclusive ranges, for which the males then compete, with varying success according to female territory size.

No investigations of similar depth have been carried out on other prunellids, and the extent to which the mating systems of the Dunnock and the Alpine Accentor are representative of the family as a whole is unknown. Nevertheless, in the case of two other species that have been studied in some detail, the Brown and Japanese Accentors, females are often assisted by more than one male when feeding nestlings, indicating a polyandrous or polygynandrous mating system. Brown Accentors are also known to be occasionally polygynous. Otherwise, anecdotal observations of the behaviour of Altai and Siberian Accentors during the breeding season suggest that these two prunellids may not always be monogamous. With the exception of the Dunnock and the Alpine Accentor, however, all members of this family merit more intensive study, particularly as they may provide further clues to the ecological basis for the evolution of mating systems.

Black-throated Accentor nests are parasitized by Horsfield's Cuckoo (*Cuculus horsfieldi*) in Central Asia, and those of Brown Accentors in the Tien Shan Mountains are parasitized occasionally by the Common Cuckoo (*Cuculus canorus*). In Britain, the Dunnock has the dubious distinction of being one of the main hosts of the latter species. It is estimated that about half of the female Common Cuckoos that breed in Britain lay their eggs in the nests of Dunnocks, although only about 2% of Dunnock nests are parasitized in this way. Despite this exploitation, which invariably results in the ejection by the cuckoo hatchling of all of the host's own offspring, Dunnocks have not evolved the ability to discriminate the parasite's egg from their own eggs, even though the pale spotted cuckoo egg is very different in appearance. Since most other regular hosts of the cuckoo can detect eggs that are so different from their own, it is puzzling that the Dunnock shows no such discriminatory ability. Davies and M. de L. Brooke have postulated that Dunnocks are recent hosts, in evolutionary time, and that their failure to reject cuckoo eggs is an example of evolutionary lag. It is known that Common Cuckoos have parasitized Dunnocks for over 600 years, but theory suggests that it may take thousands of generations for discrimination to spread through a host population if the parasitism rate is low. If the Dunnock became a regular host only when extensive forest clearance led to its becoming a common lowland species, between 2500 and 6500 years ago (see Habitat), there may not yet have been sufficient time for this discriminatory ability to evolve.

Movements

Some species of accentor are sedentary, others are partial or total migrants, and most exhibit movements from high-altitude breeding areas to lower-lying terrain during the winter. The Siberian Accentor undertakes the most extensive migratory movement of all accentors. It vacates the summer breeding range in the boreal and subarctic regions of Russia by late September, although southern parts of the breeding range may be occupied until November. The entire breeding population, from the River Pechora in the west to the Bering Sea in the east, spends the winter in Korea and eastern China. One subspecies of the Black-throated Accentor, the nominate race, is also migratory, moving from the forests of the northern Urals southwards to Iran, Afghanistan, Pakistan and the western Himalayas. This wintering range overlaps that of the other subspecies, *huttoni*, which breeds in the mountains of Central Asia and is a local altitudinal migrant or migrates over a relatively short distance.

The Dunnock is even more variable in its movements, being either sedentary or an altitudinal, partial or long-distance migrant. The northern populations, those from Fennoscandia and north-west Russia south to east-central Europe, make annual post-breeding shifts in a southerly and westerly direction. Many reach the Mediterranean Sea and its islands. By contrast, Dunnocks breeding in western Europe are essentially sedentary; even their local dispersive movements only rarely exceed 30 km in distance. In south-east Europe, this species is resident or partially migratory, with some local altitudinal migration. Most movement in this region is over relatively short distances, but the subspecies *obscura*, which breeds in the Caucasus region, eastern Turkey and north Iran, has been recorded as far south as Egypt.

Of the remaining members of the family, the majority can be characterized as having local seasonal movements that are associated with descent from high-lying breeding habitats to lower elevations, usually below the snow-line. The extent of these movements depends on environmental conditions and the topography of the region. Some prunellids remain on the breeding grounds throughout the year, but others may move over large distances in very mountainous regions. For example, Alpine Accentors that breed in the Pyrenees and other montane regions of Spain may be encountered almost anywhere in Iberia during the winter months. For most accentors, however, the distance and scale of seasonal movements are little known, largely because of these species' poorly defined ranges and a paucity of ringing studies.



*During the breeding season, the **Alpine Accentor** lives in groups of 2-5 males and 2-5 females, thus ensuring that intra-sexual competition is intense. Male testes account for 8% of body weight, while females have bright red cloacas and copulate up to 1000 times for each clutch, ranking them amongst the most sexually active of all birds. The advantage of a large breeding unit becomes apparent during the provisioning phase, when the combined effort of group members supplies enough invertebrate prey to fuel the rapid development of nestlings.*

[*Prunella collaris collaris*, Valais, Switzerland. Photo: Jacques Gilliéron]

Relationship with Man

The Dunnock is the only accentor that is closely associated with humans throughout the year. Given this degree of intimacy, it is perhaps surprising that its extraordinary mating system (see Breeding) was not described until the early 1980s. Indeed, ignorance of the species' sex life led the Reverend F. O. Morris, in 1856, to describe the Dunnock as "unobtrusive, quiet and retiring… sober and unpretending in its dress, while still neat and graceful", with a pattern of behaviour that "many of a higher grade might imitate, with advantage to themselves and benefit to others through an improved example." He would have been appalled had his parishioners taken his advice and emulated the Dunnock's habits. Some 70 years later, Viscount Grey of Fallodon had equally high regard for the Dunnock, describing its song as having "spirit and uplift", and attributing its unobtrusiveness to "not so much fear of man, as an inclination to apologise for its presence". Subsequently, a succession of brief papers reporting observations of the pre-copulatory cloaca-pecking display hinted at an unusual mating system, but it was not until the first studies of individually colour-ringed Dunnocks were conducted that the astonishing variability in this mating system and the sexual conflict that underlay it were revealed.

The relationship between Dunnocks and Common Cuckoos (see Breeding) featured in Chaucer's 1382 work *The Parlement of Foules* and also, over two centuries later, in Shakespeare's *King Lear*. Chaucer was firmly on the side of the Dunnock when he condemned the cuckoo as "Thow mordrer of the heysugge [an Old English name for the Dunnock] on the braunche that broghte thee forth! Thow rewtheless glotoun!"

Notwithstanding these two interesting examples, it could not be claimed that accentors have achieved any notable cultural prominence. They have not been kept widely as pets, despite their pleasant song; perhaps this was not regarded as sufficient compensation for their superficially unspectacular plumage. Nevertheless, the Dunnock was introduced into New Zealand by



*The **Dunnock** was once considered the archetypal boring brown bird, a model of restraint and modesty, but this all changed when intensive research revealed its sexual habits to be somewhat deviant. It transpired that the life of this particular bird was not as dreary as it looked, and that instead, unnoticed in the hedgerows and flower beds of Europe, promiscuous males and duplicitous females were locked in elaborate conflicts of interest. The available evidence suggests that polygamous breeding systems apply throughout the family, or nearly so, but information is lacking for several species.*

[*Prunella modularis mabbotti*, Álava, Spain. Photo: José Luis Gómez de Francisco]

European settlers, initially in 1868, since when it has spread to occupy a wide range of habitats, colonizing many offshore islands, including even subantarctic Campbell Island.

Accentors have probably received greatest attention as model systems for studies in evolutionary ecology. The study of Dunnocks in the Cambridge University Botanic Garden, in England, carried out by Davies and characterized by his use of elegant field experiments, has reached a wide audience through its status as a "classic" study in behavioural ecology. Detailed research on Alpine Accentors in Europe and Japan, led by Davies and M. Nakamura, respectively, has provided fresh insights into sexual conflict and the ecological basis for the evolution of avian mating systems. It would be fascinating to know how the mating systems of other accentors vary in relation to their ecological setting. If any ornithologist has the inclination and stamina needed to conduct equivalent studies on any of the remaining, neglected members of this family, he or she can be confident that the efforts expended would bring ample rewards in terms of scientific discovery.

*The breeding biology of the **Alpine Accentor** has been studied in the French Pyrenees. Here it was found that the nest, which is a cup of grass, moss and plant fibres lodged in a rocky recess, is constructed by the female. She then lays 3-4 eggs, which she incubates herself for 11-15 days. After hatching, the nestlings are fed by the female, with the assistance of up to three males, each adjusting his effort according to his mating success, and thus his likelihood of paternity. The nestling period lasts 12–16 days, during which older broods receive around eight feeds per hour, and after which an average of 2·8 young fledge per successful nest.*

[*Prunella collaris collaris*, Passo del Lucomagno, Switzerland. Photo: Alberto Cattaneo, Paolo Lietti & Angelo Lietti]



Status and Conservation

None of the Prunellidae is regarded as being globally threatened. Although the population sizes of most species are unknown, their geographical distributions suggest that, in general, they are not of current conservation concern. The Yemen Accentor has the narrowest range of any member of the family, being restricted to the high mountains of western Yemen, in the south-west corner of the Arabian Peninsula. There is a potential threat of habitat destruction in this fragile environment, where an increasing human population could lead to further exploitation of the sparse vegetation. At present, however, there is no evidence that this is a significant problem. Even so, the Yemen Accentor has been recorded from only about half a dozen localities during the breeding season, and this fact, combined with the possibility of habitat loss within its tiny range, has resulted in the species being placed in the conservation category of Near-threatened.

The Mongolian Accentor may also have a limited range, in this case in the mountains and semi-deserts of Mongolia and north-central China, but there is no reason to suspect that it is vulnerable. Its status is uncertain, but it is thought to be probably rare. This is a typically secretive and quiet accentor, and is very poorly known. Fieldwork is required in order to determine its true status, as well as to gain an understanding of its ecology and biology.

The Dunnock, although still common, has recently been listed as a species of medium conservation concern in the United Kingdom on the basis that its breeding population has declined by 25–49% over the past 25 years. Declines of this magnitude are, sadly, commonplace among farmland and woodland bird species in the UK, and a similar downward trend is now being detected across western Europe in the populations of many species that were once abundant. Such declines may be linked to agricultural intensification, but the reduction in Dunnock numbers has not been attributed to any specific factor.

In northern and eastern Europe, Dunnocks are still associated primarily with coniferous forests, where they occur at relatively low density. In Finland, however, a spectacular increase in the second half of the twentieth century, from about 8000 pairs in the 1950s to 400,000 pairs in the 1980s, offers clues as to why Dunnocks are so abundant in western Europe. Changing management of forests has created forest clearings and new plantations, thereby providing the dense scrubby habitat that the Dunnock prefers, rather than the pure coniferous forests with little understorey that used to predominate. It may be that extensive clearance of forests in western Europe in the last few thousand years has created the hedgerows and scrub habitats favoured by this species.

*The **Yemen Accentor** has the smallest range of any accentor, being restricted to the high mountains of western Yemen, where it is known from only six sites in the breeding season. Its limited distribution, and the fact that the sparse montane vegetation which it inhabits is easily damaged by collection of wood for fuel, or overgrazing, have led to its inclusion in that holding-bay for potentially threatened birds, the Near-threatened category. Further fieldwork is required to assess the size and stability of its population, as well as the degree to which it is threatened.*

[*Prunella fagani*, Sumarah Pass, Yemen. Photo: Richard Porter]



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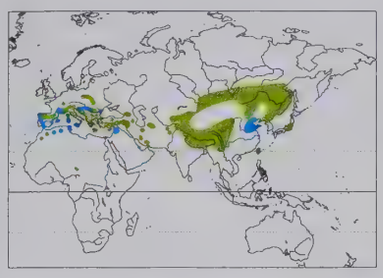
Genus *PRUNELLA* Vieillot, 1816

1. Alpine Accentor

Prunella collaris

French: Accenteur alpin **German**: Alpenbraunelle **Spanish**: Acentor Alpino
Other common names: Collared/Rock Accentor

Taxonomy. *Sturnus collaris* Scopoli, 1769, Kärnten, south Austria.
Most closely related to, and forming a species group with, *P. himalayana*; the two are sometimes placed in a separate genus, *Laiscopus*, because of larger size and distinct plumage differences in comparison with current congeners. Birds from Corsica, described as race *tschusii*, considered inseparable from nominate. Nine subspecies recognized.
Subspecies and Distribution.
P. c. collaris (Scopoli, 1769) – mountains from SW Europe E to Slovenia and Carpathians, and NW Africa (Moroccan Atlas).
P. c. subalpina (C. L. Brehm, 1831) – SE Europe (Croatia E to Bulgaria, S to Greece, including Crete) and SW Turkey.
P. c. montana (Hablizl, 1783) – N & E Turkey and Caucasus S to Iran and E to Turkmeniya.
P. c. rufilata (Severtsov, 1879) – from Kyrgyzstan E along Tien Shan, and from NE Afghanistan and extreme N Pakistan E along Pamirs to W China (Kunlun Mts).
P. c. erythropygia (Swinhoe, 1870) – from Altai Mts E to SE Russia, S to N & E Mongolia and NE China; also Japan (C Honshu).
P. c. whymperi (Stuart Baker, 1915) – W Himalayas (Ladakh E to Kumaon).
P. c. tibetana (Bianchi, 1904) – E Tibetan Plateau (S from Nan Shan, E to Gansu).
P. c. nipalensis (Blyth , 1843) – Nepal, Sikkim, Bhutan, SC China (SE Xizang, SW Sichuan, N Yunnan) and N Myanmar.
P. c. fennelli Deignan, 1964 – Taiwan.
Descriptive notes. 18 cm; male 40 g and female 36 g (*collaris*), male 45 g and female 39 g (*erythropygia*), sexes combined c. 30 g (*rufilata*, *whymperi*). Large, attractive accentor with strong bill, more upright carriage than most congeners. Nominate race has grey head and breast, slight black streaking on crown and nape, white throat with black scale-like marks; mantle and back grey-brown, broadly streaked black, lower back and rump brownish-grey, more rufescent uppertail-coverts, also streaked black, with pale edges giving scaly appearance; upperwing strongly marked, median and greater wing-coverts black with white tips (two contrasting spotted wingbars), dark secondaries with pale buff tips forming noticeable wing panel; tail feathers dark brown with white tips (in flight appearing as series of white spots or terminal band); belly pale grey, breast side and flanks bright chestnut, becoming more whitish-streaked towards rear; undertail-coverts dark brown with white feather margins (scaled appearance); iris brown; bill blackish, conspicuous yellow base (more extensive on lower mandible); legs dark pinkish-grey or brown. Sexes alike, female slightly smaller than male. Juvenile resembles adult but duller, with unspeckled throat, brownish-grey head



and chest, brown breast and flanks; buff wingbars less well defined than in adult, may be retained by some first-year birds. Races vary in size and colour: *subalpina* is similar to nominate, but paler grey on head and chest, less barring on throat, paler upperparts and flanks; *montana* is also close to nominate, but crown and neck olive-grey, streaks on mantle brown (rather than black), chestnut on flanks more extensive, spreading to side of breast and belly and down to undertail-coverts; *rufilata* differs from previous in having chestnut below more uniform, with less white streaking; *whymperi* has darker head, chest and upperparts, giving stronger contrast with white throat; *nipalensis* is darker than last; *tibetana* is generally paler than previous, with more white streaking on flanks; *erythropygia* has dark head, upperparts and chest combined with deep chestnut uppertail-coverts, scapulars and belly; *fennelli* is greyer and less brown on head and chest and paler below than last. Voice. Male song, usually from ground (often a prominent rock) but also in flight, loud and musical, a varied and sustained warble containing low-pitched trills and ripples and clear fluty whistles, may last up to 10 seconds, typically 6·5 seconds, resembles song of Eurasian Skylark (*Alauda arvensis*); male also delivers quiet subsong with closed bill. Female song (associated with competition to solicit copulations from males) at its simplest a series of trills, sometimes elaborated with multiple syllables and lasting 2 seconds or more. Characteristic call loud, pleasant rippling, with variable number of syllables, e.g. "truiririp", with purring effect; also, distinctive loud chirruping flight call.

Habitat. In breeding season, principally low cliffs, screes, rocky mountain slopes and alpine meadows above tree-line and up to snow-line; avoids areas of shrubs or trees; often close to snow patches. Breeds almost exclusively in mountain ranges: at 3600–5000 m in W Himalayas and Pakistan; mostly above 4000 m in Nepal, and observed at almost 8000 m on Mt Everest; in alpine zone above 2600 m in Japan; in W Palearctic often at lower altitudes, e.g. 1800–3000 m in Switzerland, Caucasus and Pyrenees. On Russian coast of Sea of Japan, breeds on cliffs and on rocky islands. Outside breeding season, usually at lower elevations in rocky and scrubby habitats, often close to human habitation in villages and near livestock, including woodland edges, roadsides, gardens and farms; in Europe occasionally encountered at sea-level, but only down to 1800 m in Nepal and W Himalayas.

Food and Feeding. Diet largely insects, including orthopterans, beetles (Coleoptera), earwigs (Dermaptera), heteropteran bugs, mayflies (Ephemeroptera), lepidopterans, flies (Diptera) and hymenopterans; also spiders, small snails and earthworms. Also some vegetable matter. In faecal analyses in SW Europe (Pyrenees), beetles and flies were commonest constituents. Seeds of herbs (Leguminosae, Polygonaceae) and grasses eaten mostly in late summer and winter, when seeds of pines (*Pinus*) may also be taken; also eats cereals and berries. Grit regularly taken by adults. Diet of young similar to that of adults, flies being dominant in Pyrenees, Italian Alps, Poland and Russia. Forages mainly on ground, among rocks, stones, grass, herbs, moss and lichens; particularly favours melting edges of snow patches. Proceeds with small hops or by walking, and occasionally takes insects in flight; may jump to snatch seeds and berries from low vegetation. In winter, may take crumbs and fat from birdtables and feed in barns. Often in winter flocks of 4–12 individuals, and much larger aggregations of up to 120 noted in Romanian Carpathians; sometimes with *P. himalayana* in Asia.

Breeding. Breeds May–Aug; double-brooded. Detailed studies in Europe (Pyrenees) and in Japanese Alps. Polygynandrous mating system, 2–5 males share large overlapping ranges of 2–5 females, group ranges (9–38 ha) more or less exclusive; males compete to mate with fertile females, females compete to attract males; solicitation display by female, which has high copulation rate (up to 1000 per clutch), usually involving several males. Nest, built by female, a cup made from grass, moss and plant stems, lined with hair and feathers, sited in rock crevice or beneath rock or grass tussock on cliff or shallower slope. Clutch 3–4 eggs; incubation by female, period 11–15 days; chicks fed by both sexes, but contribution of each male varies; of 38 broods studied in Pyrenees, 5% fed by female alone, 68% by female and one male, 24% by female and two males, 3% by female and three males; male care influenced by share of matings, hence paternity; total feed rate c. 8/hour for older broods; nestling period 12–16 days. In Pyrenees, 2·8 young per successful nest, 18% of broods preyed on after hatching; predators include mustelids and adder (*Vipera berus*).

Movements. Resident or altitudinal migrant, on local scale or over considerable distance. Movements in C & E Asia not well known, but breeding population in NE China winters in E provinces; otherwise, thought to be mainly local altitudinal migrant. In Europe, information only partial, but may be resident, local altitudinal migrant or extensive wanderer; some move to suitable habitat in lowlands, such as Gibraltar, S Spain and France (Côte d'Azur), but sparsely distributed in these areas; regular visitor and passage migrant on Balearic Is, and singles and flocks seen during migration on Tuscan Is (between Corsica and Italy); in Middle East, rare non-breeding visitor S to Cyprus, Israel and Jordan. N African breeders descend in winter to lower altitudes, where may be augmented by visitors from Europe. Adults more likely than young birds, and males more likely than females, to remain on breeding grounds throughout year. Males return to alpine zone in Mar–Apr, females typically in early May.

Status and Conservation. Not globally threatened. Common to locally common. No estimate of global numbers available; European population estimated to be c. 55,000–73,000 "pairs", with largest concentrations in Spain (18,000), Italy (14,000), Austria (8000) and Switzerland (5000). Recorded breeding densities in prime habitats 26 birds/km² in French Pyrenees, 12–16 birds/km² in Swiss Alps, 10–15 birds/km² in Slovakian Tatras, and 10 birds/km² in Tien Shan; density, however, varies greatly from year to year, probably dependent on differences in weather conditions and snow cover. Predation by cats and others in non-breeding season thought possibly to result in some local declines.

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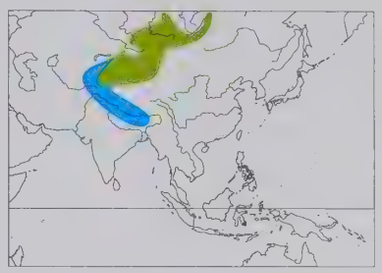
2. Altai Accentor

Prunella himalayana

French: Accenteur de l'Himalaya **German**: Himalajabraunelle **Spanish**: Acentor del Himalaya
Other common names: Himalayan Accentor, Rufous-breasted(!)/Rufous-streaked Accentor

Taxonomy. *Accentor Himalayanus* Blyth, 1842, Himalayas.
Most closely related to, and forming a species group with, *P. collaris*; the two are sometimes placed in a separate genus, *Laiscopus*, because of larger size and distinct plumage differences in comparison with current congeners. Monotypic.

Distribution. Mountains from S Russia (Altai region E to mountains E of L Baikal) and NW Mongolia S to Tien Shan and Pamirs; non-breeding in Himalayas (E to Sikkim). Range limits not well known.



Descriptive notes. 15 cm; 25–29 g. Has grey head with some black streaking; mantle and back chestnut-brown with dark streaks, rump paler brown; wings dark rufous-brown, two white wingbars; tail brown, pale terminal spots; chin and throat white, bordered by black dots; breast, upper belly and flanks striped rufous and white, lower belly creamy white; iris reddish; bill black, base of lower mandible yellow; legs yellowish. Sexes alike. Juvenile is similar to adult but paler, throat mottled grey, breast rich buff and belly creamy buff, both with dark streaks. Voice. Male song, from rock perch and in aerial pursuit of female, a loud warbling with trills and fluted whistles, similar to that of *P. collaris* but less musical and more trilling; also reminiscent of song of Red-fronted Serin (*Serinus pusillus*). Call "tee-tee", like that of a finch (Fringillidae); low twitter or constant warble during foraging while on passage.

Habitat. In summer, stony alpine meadows and bare rocky hillsides with sparse cover, usually avoiding scree and boulders; 2800–5500 m. In winter, on grassy, rocky hillsides and valleys at lower altitude, typically 2000–4500 m, exceptionally down to 1000 m.

Food and Feeding. Mostly invertebrates in summer; in winter, seeds supplemented by berries. Recorded as feeding flies (Diptera), lepidopterans, beetles (Coleoptera), orthopterans, spiders (Araneae) and small snails to nestlings. Forages inconspicuously on ground, with low crouching gait. In winter forages in flocks of 30–100 or more individuals, sometimes accompanied by *P. collaris* and Plain Mountain Finches (*Leucosticte nemoricola*).

Breeding. Season May–Aug; probably double-brooded, but details poorly known. Has been described as monogamous, but mating system and parental roles not determined; observations of 4–5 birds in flight pursuit during courtship, reminiscent of polygynandrous *P. collaris*. Some aggression among males and among females recorded, but no information on territoriality. Nest a bulky cup of roots, grass and other plant fibres and moss, lined with hair and fur, placed on ground in hollow under grass tussock or rock. Clutch 4–6 eggs; incubation by female alone, period 13 days at one nest; chicks fed by both sexes, no information on nestling period. Productivity little studied; 4·45 young reared per successful nest, and two out of nine nests destroyed by predators in Tien Shan.

Movements. Poorly known. Post-breeding migration to lower altitudes, particularly from N slopes and ridges in Tien Shan; non-breeding range includes Himalayas from N Pakistan E to Bhutan, and perhaps other regions where not recorded in summer. In Tien Shan, returns to breeding grounds in Apr.

Status and Conservation. Not globally threatened. Locally common. No estimates of numbers available; in S Siberia, described as second most abundant species in alpine tundra area of Sayano-Shushensky Reserve, with 10 birds/km², and common also in W Sayan Mts. In winter, fairly common to uncommon in N Indian Subcontinent; occasional breeding-season records in e.g. N Pakistan and Kashmir, but no confirmed breeding there.

Bibliography. Ali & Ripley (1987a), Ali *et al.* (1996), Bräunlich (2002), Cheng Tsohsin (1987), Dementiev *et al.* (1968), Étchécopar & Hüe (1983), Flint *et al.* (1984), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Inskipp *et al.* (1999), Knystautas (1993), Kovshar (1979), MacKinnon & Phillipps (2000), Majumdar *et al.* (1992), Meyer de Schauensee (1984), Roberts (1992), Rogacheva (1992), Stepanyan (1990), Vaurie (1959).

3. Robin Accentor

Prunella rubeculoides

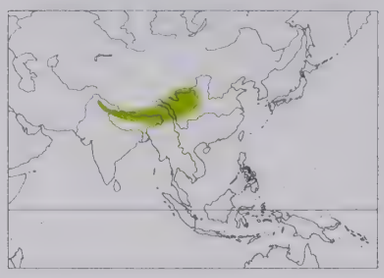
French: Accenteur rougegorge **German**: Rostbrustbraunelle **Spanish**: Acentor Petirrojo
Other common names: Robin Hedge-sparrow

Taxonomy. *Accentor rubeculoides* F. Moore, 1854, Nepal.
Apparently no close affinities within genus. Geographical variation slight; proposed races *muraria* (described from NW Kashmir), *fusca* (from C Xizang, in SW China) and *beicki* (from N Gansu, in NC China) show little difference from populations elsewhere in range. Treated as monotypic.

Distribution. Himalayas (from Baltistan and Ladakh E to Bhutan) and SW & C China (S & SE Xizang E to NE Qinghai, N Gansu and W Sichuan).

Descriptive notes. 16–17 cm; 23 g. Has grey head and throat, brown upperparts with dark streaking on mantle and back; wings and tail greyish-brown, two pale wingbars; breast and breast side rufous, belly and vent cream-coloured, rufous-brown streaks on lower flanks; iris reddish-brown; bill dark grey to blackish; legs dull red-brown. Sexes alike. Juvenile has dark streaks on head and neck, buff breast with dark streaks, diffusely streaked flanks. Voice. Short sweet song, described as "si-tsi-si-tsi-tsu-tsitsi", may accompany collective display by males; usual call a metallic trill.

On following pages: 4. Rufous-breasted Accentor (*Prunella strophiata*); 5. Brown Accentor (*Prunella fulvescens*); 6. Siberian Accentor (*Prunella montanella*); 7. Mongolian Accentor (*Prunella koslowi*); 8. Black-throated Accentor (*Prunella atrogularis*); 9. Radde's Accentor (*Prunella ocularis*); 10. Yemen Accentor (*Prunella fagani*); 11. Dunnock (*Prunella modularis*); 12. Japanese Accentor (*Prunella rubida*); 13. Maroon-backed Accentor (*Prunella immaculata*).



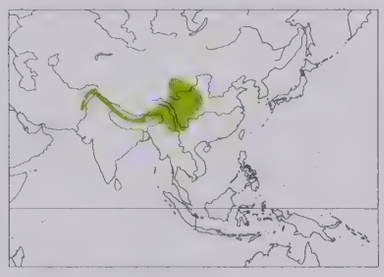
Habitat. Breeds in damp, boggy areas of scrub, particularly willow (*Salix*), and tussock grasses, often adjacent to lakes and streams in valley bottoms; usually at 3500–5500 m, but down to 3000 m in places (Suru Valley, in Ladakh). In winter, still found to 5000 m but also at lower altitudes, down to 2700 m in Ladakh and, in India, to 2500 m (Sikkim) and even as low as 1000 m (Himachal Pradesh). Preference for bare, stony and rocky habitats in winter, when frequently found near human habitation.
Food and Feeding. Small seeds and invertebrates, perhaps including small crustaceans; seeds predominate in winter. Forages on ground, usually in open grassy places; commonly in small flocks in winter months.
Breeding. Season May–Aug; double-brooded. No information on mating system or parental roles in breeding; collective display involving fluttering flight by several males. Nest a bulky cup of grass and moss, lined with fur, hair or feathers, usually sited on ground among clumps of sedge, occasionally in hollow in bank or in low vegetation bordering stream. Clutch 3–5 eggs; chicks fed by both adults; no information on incubation and fledging periods.
Movements. Resident; some post-breeding movement to lower elevations, details unknown.
Status and Conservation. Not globally threatened. Fairly common in suitable habitat through much of range. No estimates of numbers available. Local in Pakistan, common only on Deosai Plateau; uncommon in Bhutan. Locally rather uncommon in China.
Bibliography. Ali & Ripley (1987a), Ali *et al.* (1996), Bangs (1932), Cheng Tsohsin (1987), Étchécopar & Hüe (1983), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Inskipp & Inskipp (1991), Inskipp *et al.* (1999), Li Mingcai *et al.* (2003), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Ripley (1982), Roberts (1992), Vaurie (1959, 1972), Zheng Guangmei & Zhang Cizu (2002).

4. Rufous-breasted Accentor

Prunella strophiata

French: Accenteur à poitrine rousse **German**: Strichelbraunelle **Spanish**: Acentor Pechirrufo

Taxonomy. *A.[ccentor] strophiatus* Blyth, 1843, Nepal.
Apparently no close affinities within genus. Two subspecies recognized.
Subspecies and Distribution.
P. s. jerdoni (W. E. Brooks, 1872) – E Afghanistan and W Himalayas (from Kumaon E to W Nepal).
P. s. strophiata (Blyth, 1843) – E Himalayas (E from C Nepal), C China (E Qinghai, Gansu and SW Shaanxi S to SE Xizang, N Yunnan and W Sichuan) and N Myanmar.



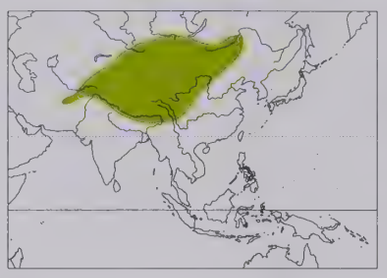
Descriptive notes. 15 cm; 18 g. Has conspicuous supercilium white in front of eye, becoming broader and ochraceous above and behind eye, and blackish lateral crownstripe; blackish cheeks, narrow white crescent below eye; crown and upperparts brown with black streaks; wings and tail dark brown, two indistinct pale wingbars; throat whitish, variably streaked dark, streaks often forming indistinct malar stripe and/or throatband; broad rufous chestband, often with some thin dark streaks; rest of underparts pale cream with dark streaking, especially on flanks; iris brown; bill blackish; legs dull orange-brown. Sexes alike. Juvenile has supercilium whitish, lacking ochraceous colour, pale tips of crown and back feathers giving speckled appearance, buff-washed breastband and paler belly both entirely streaked. Race *jerdoni* is paler and less heavily streaked than nominate. Voice. Song, delivered from rock or occasionally in flight, very frequent at start of breeding, a melodious warbling and trilling verse, reminiscent of song of Northern Wren (*Troglodytes troglodytes*) but longer and quieter and with more trills. Call a fast, penetrating "tr-r-r" or "trr-r-rit".
Habitat. In summer, occupies upper limits of birch (*Betula*), oak (*Quercus*) and pine (*Pinus*) forests with rhododendron (*Rhododendron*) scrub, and subalpine scrub of juniper (*Juniperus*), willow (*Salix*), *Berberis* or *Viburnum* above tree-line; occasionally higher in alpine meadows; usually breeds from 2700 m to 3600 m in W Himalayas, up to 5000 m in E Nepal, and generally c. 2400–4300 m in China. In winter, found in more open scrubby habitats and fallow fields at lower altitudes, 1300–3600 m in Nepal and Bhutan; as low as 500 m in W of range.
Food and Feeding. Invertebrates, including worms; small seeds, berries and fruit. Forages in skulking manner on ground beneath bushes, often in clumps of *Viburnum* or willow.
Breeding. Season May–Aug; double-brooded. No information on mating system. Nest a deep cup of moss, dried stems and lichen, lined with grass, hair and feathers, typically placed low down in thicket of scrub, occasionally up to 3 m from ground in small conifer. Clutch 3–5 eggs; incubation and care of young apparently by both sexes, but few observations and no information on periods.
Movements. Resident, with local altitudinal movements; descends to lower elevations in winter months.
Status and Conservation. Not globally threatened. Most widespread and abundant accentor in W of range; probably less numerous in China. No estimate of numbers available. Status in Myanmar uncertain; possibly only non-breeding visitor.
Bibliography. Ali & Ripley (1987a), Ali *et al.* (1996), Bangs (1932), Bates & Lowther (1952), Cheng Tsohsin (1987), Étchécopar & Hüe (1983), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Inskipp *et al.* (1999), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Ripley (1982), Roberts (1992), Robson (2000), Smythies (1986), Vaurie (1955, 1959), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002).

5. Brown Accentor

Prunella fulvescens

French: Accenteur brun **German**: Fahlbraunelle **Spanish**: Acentor Pardo
Other common names: Pale Accentor

Taxonomy. *Accentor fulvescens* Severtsov, 1873, Turkestan.
Forms a species group with *P. montanella*, *P. koslowi*, *P. atrogularis*, *P. ocularis* and *P. fagani*; last two formerly treated as races of present species or as forming a superspecies with it. Racial differentiation complicated owing to individual variation (partly age-related, also influenced by plumage wear) and occurrence of intermediates. Described race *sushkini* (from extreme S Xizang, in China) synonymized with *khamensis*. Six subspecies recognized.
Subspecies and Distribution.
P. f. dahurica (Taczanowski, 1874) – E Kazakhstan (Tarbagatay), SC Russia (Altai and Sayan Mts E to Transbaikalia), Mongolia (except W & SW) and NE China (NW Manchuria).
P. f. mongolica Sushkin, 1925 – W & SW Mongolia (Achit Nur, Gobi-Altai) and N China (W Nei Mongol, N Ningxia).
P. f. fulvescens (Severtsov, 1873) – SE Kazakhstan and W China (E to E Xinjiang and NE Xizang) S to C Afghanistan, and W Himalayas (E to extreme N India).
P. f. dresseri Hartert, 1910 – W China (S Xinjiang and Qaidam Basin S to Kunlun Mts).
P. f. nanschanica Sushkin, 1925 – C China (NE Qinghai and SW Gansu S to S Sichuan).
P. f. khamensis Sushkin, 1925 – S fringe of Tibetan Plateau in SW China (S & SE Xizang, E to Qamdo region) and adjacent N Nepal and N Sikkim.



Descriptive notes. 15 cm; 20 g. Nominate race is olive-brown with sandy-grey tinge above (slightly darker in W Himalayas), mantle and scapulars with faint darker streaking; long, broad creamy-white supercilium, contrasting dark brown ear-coverts, grey neck side; tail and flight-feathers blackish-brown with buff margins; pale tips of dark median and greater wing-coverts form two indistinct wingbars; buff below, paler on throat and belly, and rich pinkish-buff, almost apricot on breast; iris yellow-brown; bill dark grey; legs pale reddish-brown to yellowish-brown. Sexes alike. Juvenile has narrower, less distinct supercilium, paler ear-coverts, more rufous back than adult, throat pale with dusky spots, underparts rich buff, some dark brown streaking on breast. Races vary largely in ground colour and amount of streaking on upperparts and depth of ochraceous colour below: *dahurica* is darkest, crown almost blackish, upperparts cold dark grey, distinctly streaked from hindneck to lower mantle and scapulars, rump uniform dull brown-grey, entirely cinnamon-buff below (belly paler only when plumage worn); *mongolica* is very like nominate, differing only in slightly darker and browner (less olive) upperparts, especially rump, and darker buff (less creamy) belly; *dresseri* is palest, light sandy-drab to medium buff-grey above, faint narrow brown-grey streaks on lower mantle and scapulars (also crown when plumage fresh), creamy below, slightly warmer pink-buff on breast and sometimes flanks; *nanschanica* is similar to nominate, but upperparts and flanks heavily and contrastingly streaked black, bill shorter than in other races; *khamensis* is heavily streaked like previous, but ground colour darker, streaking above more extensive (reaching uppertail-coverts), breast rich ochraceous, becoming buff on belly. Voice. Song, from top of bush, tree or rock, only rarely in flight, fairly loud, low warble with trills, "tuk-tileep-tilee-tileep-tileep", 2–3 seconds long; likened to that of *P. atrogularis* or an inferior song of European Robin (*Erithacus rubecula*) but more monotonous in composition and rhythm. Call "ziet-ziet-ziet", like that of a bunting (Emberizidae).
Habitat. In summer, found on open rocky or stony alpine and subalpine slopes, also in juniper (*Juniperus*) scrub, in high barren valleys; prefers drier regions, but not the driest; at 2400–3500 m in Tien Shan, but to 5100 m in W Himalayas and SW China (Xizang). In winter, found in same habitats, and upper limit of pine (*Pinus*) forest, but also extends below tree-line, down to 1500 m; also frequent in villages.
Food and Feeding. Mainly invertebrates and seeds. Adult diet not studied in detail, but invertebrates dominate in summer; seeds, supplemented by small berries, in winter. In Tien Shan, nestling diet dominated by flies (Diptera) and homopteran bugs, with significant proportions also of orthopterans, spiders (Araneae), lepidopterans, beetles (Coleoptera) and small snails. Forages mainly on ground, also in bushes and even tree crowns; occasionally takes insects in flight. Searches leaf litter in manner of a thrush (Turdidae), and may dig through 4–5 cm of snow to reach soil surface. Outside breeding season, usually in small, confiding parties of up to about ten individuals.
Breeding. Season Apr or May, depending on altitude, to Aug; double-brooded. Mating system apparently variable: polygyny, polyandry, monogamy and possible polygynandry recorded in Tien Shan. Territorial; territory c. 1 ha, nests usually separated by more than 100 m. Nest, built by female, a cup of plant stems and grass, lined with wool, hairs and feathers; placed in diverse sites, mostly in juniper bush or spruce tree (*Picea*), also in building, rock crevice, or beneath rocks or vegetation, 74% sited less than 2 m from ground but up to 8 m high, proportion on ground greater at higher altitudes. Clutch 3–5 eggs; incubation by female alone, sometimes fed on nest by male, period 10–12 days; nestlings fed by both sexes, 40% of 20 broods fed by female and two males; males sometimes feed chicks at nests belonging to different females in rapid succession; nestling period 10–15 days; female may start new nest when fledglings still dependent. In Tien Shan, 77% of nests successful, main nest predators crows (Corvidae), raptors and mustelids. Nests sometimes parasitized by Common Cuckoo (*Cuculus canorus*).
Movements. Resident and local altitudinal migrant. Some descend below tree-line in winter months, but many remain on breeding grounds throughout year. Little evidence that non-breeding range differs substantially from summer range.
Status and Conservation. Not globally threatened. Widespread and relatively common in suitable habitat through much of range. Scarce to locally common, with densities of 3–4 birds/km², in S Russia; occurs in Sayano-Shushensky Reserve. No estimate of numbers or population trends available, but appears not to be at any risk.
Bibliography. Ali & Ripley (1987a), Bangs (1932), Cheng Tsohsin (1987), Cramp (1988), Dementiev *et al.* (1968), Étchécopar & Hüe (1983), Flint *et al.* (1984), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Knystautas (1993), Kovshar (1975, 1979), MacKinnon & Phillipps (2000), Mauersberger *et al.* (1982), Mey (1988), Meyer de Schauensee (1984), Roberts (1992), Rogacheva (1992), Stepanyan (1990), Stephan (1994), Vaurie (1959, 1972), Xing Lianlian (1996), Zheng Guangmei & Zhang Cizu (2002).

6. Siberian Accentor

Prunella montanella

French: Accenteur montanelle **German**: Bergbraunelle **Spanish**: Acentor Siberiano
Other common names: Mountain Accentor

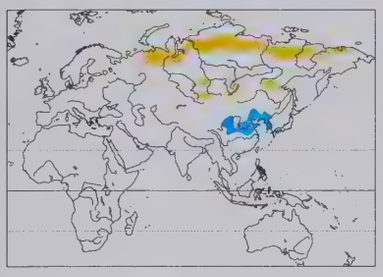
Taxonomy. *Motacilla montanella* Pallas, 1776, Dauria, Siberia.

Forms a species group with *P. fulvescens*, *P. koslowi*, *P. atrogularis*, *P. ocularis* and *P. fagani*. Population breeding in NC part of range (between R Khatanga and R Lena) of uncertain racial identity; probably belong to nominate race, and tentatively included within it. Two subspecies recognized.

Subspecies and Distribution.

P. m. montanella (Pallas, 1776) – breeds extreme NE Europe and W Siberia (from Bol'shezemel'skaya tundra, on W side of Ural Mts) E to R Lena and, in S Russia, patchily from upper R Ob, upper R Yenisey region (N of Krasnoyarsk) and Altai E to Amur region.

P. m. badia Portenko, 1929 – breeds NE Siberia from R Lena E to Anadyrland, S to W shore of Sea of Okhotsk.



Descriptive notes. 14·5 cm; 17·5 g. Male nominate race has greyish-brown crown with black edge, contrasting long, broad creamy-yellow supercilium; ear-coverts blackish, buff at rear; side of neck grey; mantle, back and wings brown, mantle with rich chestnut streaks, rump and tail greyish-brown; whitish tips of median and greater wing-coverts form two narrow wingbars (obvious only at close range); throat and breast rich yellow-buff, flanks rich buff, dark chestnut streaks on breast and flanks, creamy central belly shading to greyish on vent; iris yellowish-brown; bill dark, ochre base of lower mandible; legs dull orange-brown. Female differs from male only in having brown less rich and streaks less well defined. Juvenile is less rufous than adult, has duller head pattern and underparts, large brown spots on chest and breast. Race *badia* is slightly smaller than nominate, also darker, with richer chestnut mantle, deeper ochre-buff underparts, streaks on flanks more rufous. Voice. Song, from top of bush or tree, melodious and quite powerful, generally reminiscent of *P. modularis* song; possibly two song types, one close to that of latter, the other more buzzy. Contact call trisyllabic, "dididi".

Habitat. Breeds in boreal and subarctic zone, chiefly along N limits of coniferous and deciduous forests, in valleys, often close to riverbanks in dense tangles of bushes and trees such as willow (*Salix*); also in spruce (*Picea*) taiga, and on mountains to tree-line in sparse spruce and birch (*Betula*) woodland. In winter, occupies thickets and shrubs, particularly alongside rivers and streams.

Food and Feeding. Diet mostly insects; in winter also seeds, including crowberry (*Empetrum*) Amaranthaceae and Betulaceae. Young fed on insects, especially beetle (Coleoptera) larvae. Forages mainly on ground, by pecking at soil, grass and dead leaves; also in trees and bushes. Foraging sites include those adjacent to snowfields.

Breeding. Season Jun–Aug; probably double-brooded in S of range, but one brood in Urals. Little information on mating system or territoriality; nominate race recorded in groups of 2–6 pairs, with nests closely spaced, but nests of *badia* usually far apart. Nest a compact cup of twigs, moss, leaves and plant stems, lined with fine grasses and hairs, built 0·4–8 m above ground in fork of low tree or in thick shrub. Clutch 4–6 eggs; incubation by female, period at one nest 10 days; no further information.

Movements. Migratory; entire population winters in C & E China and Korea. Leaves N Urals and E Siberia in early Sept, but present until Oct or Nov in S of breeding range; return passage through Mongolia from late Mar and in E Russia in Apr–May, arrival on N breeding grounds in Jun; S breeding grounds very poorly known, occupied from early May. Vagrants recorded in W Europe, Japan and W North America (Alaska, British Columbia, Washington, Idaho).

Status and Conservation. Not globally threatened. Locally common to uncommon or rare. Population in small European part of range estimated to be c. 16,000 pairs; no comparable figures from elsewhere. Variable abundance in breeding areas; in Bol'shezemel'skaya tundra (NW Russia), 3 pairs/km² in fragmented spruce scrub and river terraces, up to 5 pairs/km² in dense riverine birch, willow and juniper (*Juniperus*) scrub; density also varies annually (dependent on weather conditions), e.g. 7·4 birds/km² bred in Ary-Mas Reserve (in SE Taymyr Peninsula) in 1983, far more than in 1981. Generally scarce in E part of range, although 5 birds/km² in Amur region of Russian Far East. No information on population trends.

Bibliography. Ali & Ripley (1987a), Austin & Kuroda (1953), Bowler (1994), Brazil (1991), Cheng Tsohsin (1987), Cramp (1988), Daimon (1999), Dementiev *et al.* (1968), Estafiev (1977, 1979), Étchécopar & Hüe (1983), Flint *et al.* (1984), Hagemeijer & Blair (1997), Heath *et al.* (2000), Kaufman (1997), Knystautas (1987, 1993), MacKinnon & Phillipps (2000), Mauersberger (1993), Mey (1988), Meyer de Schauensee (1984), Morgan (1998), Morozov (1987), Portenko (1973), Rogacheva (1992), Snow & Perrins (1998), Sonobe (1982), Stepanyan (1990), Stephan (1994), Tsutsubuchi & Fujimaki (1998), Uspenski (1965), Vaurie (1959), Xing Lianlian (1996), Zhang Cizu *et al.* (1997), Zheng Guangmei & Zhang Cizu (2002).

7. Mongolian Accentor

Prunella koslowi

French: Accenteur de Koslov **German**: Steppenbraunelle **Spanish**: Acentor Mongol
Other common names: Koslov's Accentor

Taxonomy. *Accentor Koslowi* Przevalski, 1887, Alxa Mountains, north China.

Forms a superspecies with *P. atrogularis*, the two belonging to a species group that also includes *P. fulvescens*, *P. montanella*, *P. ocularis* and *P. fagani*. Geographical races *tenella* (described from Uliastaj, in W Mongolia) and *pallida* (probably from S Altai) proposed, but differences attributed to individual variation. Monotypic.

Distribution. Poorly known. Mountains and semi-deserts of W, C & S Mongolia (including Gobi-Altai) and NC China (Helan Mts and Zhongwei region, in Ningxia).



Descriptive notes. 15 cm. Crown and upperparts are brown with dark streaks; wing and tail feathers brown with buff edges, wing-coverts with white tips (two indistinct wingbars); throat grey, underparts buff; iris brown; bill blackish; legs brownish-pink. Sexes alike. Juvenile undescribed. Voice. Song reported as quiet and reminiscent of that of *P. fulvescens*; no information on calls.

Habitat. Thin scrub in semi-desert and dry mountains. No information on altitudinal range.

Food and Feeding. No information on diet. Forages in skulking manner close to or beneath bushes.

Breeding. Two records; nest placed close to ground; clutch 4–5 eggs. No other information.

Movements. No information, although reported as returning to breeding ground near L Orog Nuur in mid-May.

Status and Conservation. Not globally threatened. Status uncertain; probably rare, but secretive and quiet, possibly overlooked. Possibly only a non-breeding visitor in China. Fieldwork required in order to establish this species' precise range, as well as details of its ecology and biology.

Bibliography. Bräunlich (2002), Cheng Tsohsin (1987, 2002), Étchécopar & Hüe (1983), Kozlova (1928, 1933), MacKinnon & Phillipps (2000), Mauersberger *et al.* (1982), Meyer de Schauensee (1984), Stattersfield *et al.* (1998), Stepanyan & Bold (1976), Vaurie (1959).

8. Black-throated Accentor

Prunella atrogularis

French: Accenteur à gorge noire **German**: Schwarzkehlbraunelle **Spanish**: Acentor Gorginegro

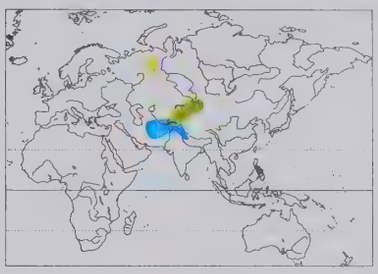
Taxonomy. *Accentor atrogularis* J. F. Brandt, 1844, Semipalatinsk, north-east Kazakhstan.

Forms a superspecies with *P. koslowi*, and appears also to be close to *P. ocularis*; all three belong to a species group that also includes *P. fulvescens*, *P. montanella* and *P. fagani*. Proposed C Asian races *lucens* (described from R Tzagma, in C Tien Shan) and *menzbieri* (from Katon-Karagai, in SW Altai) regarded as synonymous with *huttoni*. Original spelling of species name has repeatedly been quoted as "*atragularis*", but this is erroneous. Two subspecies recognized.

Subspecies and Distribution.

P. a. atrogularis (J. F. Brandt, 1844) – breeds in N & C Ural Mts, in NW Russia; non-breeding in SW Asia.

P. a. huttoni (F. Moore, 1854) – breeds in mountains of WC Asia, from Altai Mts S to Pamirs; non-breeding in SW Asia.



Descriptive notes. 15 cm; 19 g. Nominate race has crown and nape greyish-brown with black streaks and black border, long pale cream supercilium; blackish ear-coverts separated from black of chin and throat (pale-spotted in fresh plumage) by thin pale malar stripe; side of neck grey; mantle and scapulars grey-brown, streaked blackish-brown, back, rump and tail olive-brown; wings blackish-brown, tertials and secondaries edged buff, white spots at tips of median and greater wing-coverts (indistinct wingbars); below, pronounced white gorget around black throat, grading to rich buff on breast and flanks, flanks with brown streaks and chest side with less distinct spots; belly and vent cream-coloured; dark areas become darker and underparts paler when plumage worn; iris brown; bill blackish, paler base of lower mandible; legs brownish to yellow-brown or pinkish-brown. Sexes alike. Juvenile has head pattern more poorly defined than adult, with narrower supercilium, no grey patch on neck, also duller, less clearly streaked upperparts, throat grey-brown with pale speckling (rather than black), underside more streaked. Race *huttoni* lacks white gorget, is darker above and below than nominate, with larger throat patch, heavier streaks on flanks, also has longer bill, relatively rounded wings (presumably associated with more sedentary habits). Voice. Song, from top of shrub or small tree, a pleasant verse with buzzes, piping sounds and a distinctive long, low-pitched "hwee", resembles songs of *P. modularis* and *P. montanella*; song of race *huttoni* rendered as "teets-reetee-teets-reeteee-teets-reetee-tsee-feetee". Contact call a soft trill; alarm at nest a quiet "teeteetee".

Habitat. In summer, favours low, thick, thorny scrub and avoids open habitats: in clumps of stunted spruce (*Picea*) in subalpine zone in Urals; race *huttoni* found in coniferous and deciduous forests and in scrub, often with juniper (*Juniperus*), in C Asia; to 3000 m. Where breeding range overlaps with that of *P. montanella* (in NW Russia), present species is concentrated in S montane region, rather than in boreal lowlands to N. Diverse habitats at lower elevations in winter; sandy semi-desert with some tamarisk (*Tamarix*) scrub in Afghanistan, and semi-arid hills in Pakistan (Punjab Salt Range); orchards and dense vegetation in damp valleys in N Pakistan, and scrub-jungle, tea plantations and other cultivated habitats in India; to 2500 m, mostly below 1800 m.

Food and Feeding. Primarily insects and other small arthropods, and worms and snails; also seeds, mainly in winter. Diverse arthropod prey include springtails (Collembola), lepidopterans, beetles (Coleoptera), bugs (Hemiptera), also spiders (Araneae) and mites (Acarina). Plant food mainly seeds of grasses and herbaceous plants, including Amaranthaceae, Compositae, Leguminosae, Ranunculaceae, Rosaceae and Umbelliferae; also of trees, e.g. Pinaceae, Cupressaceae and Betulaceae. Nestling food similar to that of adults; in Tien Shan, homopteran bugs and flies (Diptera) dominant. Forages on ground in dense shrubs, woods, grassy clearings, and banks of rivers and streams. In winter, forages in scrubby forest, bushes, and patches of weeds and reeds, either solitarily or in small parties.

Breeding. Information mostly from studies of race *huttoni* in Tien Shan Mts. Breeds May–Aug; two, possibly three, broods. Presumed monogamous, as no indication to contrary, but further study needed. Strictly territorial; territory 2–12 ha in Tajikistan. Nest, built by female, a bulky cup of moss, twigs, grasses and stems, lined with fine grass and hairs, placed usually below 3 m (but up to 13 m up) in tree or shrub, mostly in spruce or juniper. Clutch 3–5 eggs; incubation by female alone, period 11–14 days; nestlings fed by both sexes, more by female (62% of feeds) than by male (38%), chicks 8–13 days old fed 11–16 times per hour; young fledge at 11–14 days. Of 140 nests in Tien Shan, 56% successful, most losses due to predation. Nests in C Asia parasitized by Horsfield's Cuckoo (*Cuculus horsfieldi*).

Movements. Nominate race migrates S from Ural Mts to wintering grounds in E Iran, Turkmenistan and Uzbekistan S to Afghanistan and NW Indian Subcontinent and extreme SW China; departs from Aug, reaching Pakistan and N India mid-Oct; heads N from winter quarters in Mar, arriving S Urals in Apr. C Asian population (*huttoni*) partially migratory; makes altitudinal movements, but some migrate to same winter quarters as those of nominate race; birds that remain in mountains may stay close to breeding territory. Races mix over much of non-breeding range, but not evenly; nominate recorded mostly from Afghanistan, also N Pakistan and E to China, and *huttoni* mostly from C Asia and Kashmir, but also W to Afghanistan.

Status and Conservation. Not globally threatened. Locally fairly common to rare. Population of nominate race on European side of Urals estimated at 3500–4000 pairs, with recorded densities in Pechora Basin 20 birds/km² of spruce with herb layer, 1 bird/km² of spruce with moss layer, and 9–24 birds/km² of birch (*Betula*), larch (*Larix*) and willow (*Salix*); generally rare in Europe, where listed as Vulnerable. Few data for race *huttoni*, but in Tien Shan 70 birds/km² of juniper scrub; regarded as rare in China, but more information needed; breeds in Sayano-Shushensky Reserve, in extreme N of range in SC Russia.

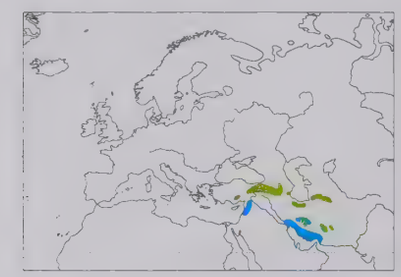
Bibliography. Ali & Ripley (1987a), Alström (1991), Bowler (1994), Cheng Tsohsin (1987), Cramp (1988), Dementiev *et al.* (1968), Dunn (1994), Edenius & Giesler (1990), Estafiev (1977, 1981), Étchécopar & Hüe (1983), Flint *et al.* (1984), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Hagemeijer & Blair (1997), Heath *et al.* (2000), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Knystautas (1993), Kovshar (1979), Loskot (1994b), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Portenko (1937), Roberts (1992), Rogacheva (1992), Snow & Perrins (1998), Stepanyan (1990), Vaurie (1955, 1959, 1972).

9. Radde's Accentor

Prunella ocularis

French: Accenteur de Radde **German**: Steinbraunelle **Spanish**: Acentor de Radde
Other common names: Spot-throated/Spotted Accentor

Taxonomy. *Accentor ocularis* Radde, 1884, Mount Kiz Yurdi, Talysh Mountains, Azerbaijan-Iran border.
Was formerly often considered conspecific with *P. fulvescens* and/or *P. fagani*, but appears more closely allied to *P. atrogularis*, with which it shares some features and perhaps constitutes a superspecies; all four belong to a species group that also includes *P. montanella* and *P. koslowi*. Monotypic.
Distribution. S & E Turkey, Armenia, W & SE Azerbaijan and mountains of N, SW & E Iran.



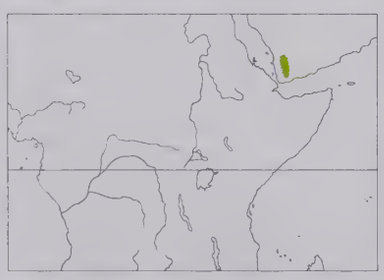
Descriptive notes. 15·5 cm; 20–25 g. Has blackish-brown crown and ear-coverts, conspicuous broad white supercilium; hindneck grey, mantle and back olive-brown with black streaks; wings grey-brown, two wingbars formed by creamy margins of median and greater wing-coverts; throat white to pale buff, broken dark malar stripe; breast and upper belly warm cinnamon-buff (breast side mottled when plumage worn), rest of underparts creamy white, flanks streaked blackish-brown; iris brown; bill blackish-brown, base of lower mandible yellowish to horn-coloured; legs reddish-brown. Distinguished from similar *P. fagani* by unstreaked darker crown and ear-coverts, more olive-toned upperparts, less distinct malar stripe, more richly coloured breast, less streaking below. Sexes similar, female with less contrasting head pattern than male. Juvenile resembles adult, but warmer tone and less contrast in markings, supercilium less distinct, throat and breast streaked. Voice. Song, from top of bush or rock, short and fast, twittering, with warbles and bubbling quality, similar to that of *P. modularis*; call "ti-ti-ti" or "tseep", thinner and less penetrating than that of *P. modularis*.
Habitat. In Turkey, breeds in rocky pastureland with scattered barberry (*Berberis*) bushes, at 1900–3000 m; in Transcaucasia, on rocky mountain slopes with scrubby juniper (*Juniperus*), cedar (*Cedrus*) and other vegetation, at 2000–3500 m. In winter, also in shrubby areas adjacent to mountain streams, down to 1000 m.
Food and Feeding. Poorly known. Diet includes insects and seeds. Forages on ground among rocks, scrub and low vegetation, also alongside streams and at edge of snow patches.
Breeding. Few records. Nests found Jun–Aug; probably double-brooded. No information on mating system. Nest a cup of twigs, leaves and stems, lined with hair, wool, grass and moss, placed low down in low bush, in one case 1 m from ground. Clutch 3–4 eggs; incubation period 11–12 days; nestling period c. 12 days; nestlings and fledglings fed by both sexes.
Movements. Probably mostly resident, with altitudinal movement and some short-distance migration. In Turkey, normally winters at nearby lower levels, extending regularly S to N Israel, and vagrant N Arabia. Iran population also migrates altitudinally; thought to winter in lowlands S of breeding range, but distribution poorly known.
Status and Conservation. Not globally threatened. Rather uncommon to rare, with fragmented distribution. Minimal population data; estimate of 500–5000 pairs, probably more, in Turkey and probably a maximum of several hundred pairs in Armenia and Azerbaijan. Listed by BirdLife International as Vulnerable in Europe; habitat degradation in lower-lying non-breeding areas thought to represent main threat.
Bibliography. Adamian & Klem (1999), Ali & Ripley (1987a), Alström (1991), Bara (2003), Baumgart *et al.* (2003), Beaman *et al.* (1975), Cramp (1988), Dementiev *et al.* (1968), Dunn (1994), Flint *et al.* (1984), Gaston (1968), Hagemeijer & Blair (1997), Hansson *et al.* (1998), Harrison (1982), Heath *et al.* (2000), Hüe & Étchécopar (1970), Knystautas (1993), Loskot (1994a, 2003), Martins (1998), Meiklejohn (1948), Norton (1958), Porter *et al.* (1996), Roberts (1992), Rogers (2001), Snow & Perrins (1998), Stepanyan (1990), Vaurie (1955, 1959).

10. Yemen Accentor

Prunella fagani

French: Accenteur d'Arabie **German**: Jemenbraunelle **Spanish**: Acentor del Yemen
Other common names: Arabian Accentor

Taxonomy. *Accentor fagani* Ogilvie-Grant, 1913, Yemen.
Formerly considered a race of *P. ocularis*, or even of *P. fulvescens*, but now regarded as a distinct species; all three belong to a species group that also includes *P. montanella*, *P. koslowi* and *P. atrogularis*. Monotypic.
Distribution. Mountainous region of W Yemen.



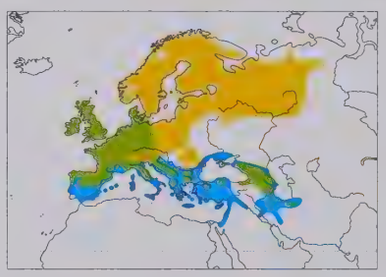
Descriptive notes. 15 cm; 22 g. Has dark crown and ear-coverts slightly streaked, conspicuous white supercilium; hindneck grey, mantle and back warm brown with black streaks; wings brown, two pale wingbars formed by creamy tips of median and greater wing-coverts; throat pale whitish-buff, distinct dark-spotted malar stripe; breast, flanks and upper belly buff, streaked dark brownish, vent creamy white; iris brown; bill blackish-brown, base of lower mandible yellowish; legs reddish-brown. Distinguished from similar *P. ocularis* by less black and more streaked head markings, generally warmer upperparts and duller underparts, stronger malar stripe, more extensive streaking below. Sexes alike. Juvenile resembles adult, but with less contrast in markings, less distinct supercilium and malar stripe, more streaking on throat and breast. Voice. Song, usually from rock or small bush, short and fast, 6–9 clear notes e.g. "drsi-drsi-drsi-du-du-du", ending with scratchy sound, shorter and more staccato than songs of *P. modularis* and *P. ocularis*; sometimes interspersed with more trilling notes. Call similar to "tseep" of *P. modularis*, sometimes uttered trisyllabically.
Habitat. In summer, rocky mountain slopes with short grassy and scrubby vegetation, often associated with scree or cliffs; also on cultivated terraces. At 1850–3000 m; also at lower altitude in non-breeding season.
Food and Feeding. Diet insects and seeds. Forages on ground. No other information.
Breeding. Breeds in spring. One nest documented, of small twigs, with cup of fine herbs lined with feathers, sited low down in shrubby vegetation. No other information.
Movements. Some altitudinal migration, probably mainly to S of breeding range.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in South-west Arabian Mountains EBA. Very local; known from just six localities in breeding season, and occurs at fairly low density; relatively common at only one site. Has smallest range of any accentor species; breeds within a zone of relatively high rainfall and dense human colonization that has been heavily cultivated for thousands of years. Further expansion of human population could lead to potential habitat destruction through increased exploitation of the montane vegetation (e.g. by collection for fuelwood, overgrazing by stock); no evidence that this is a significant problem at present.
Bibliography. Brooks *et al.* (1987), Collar *et al.* (1994), Cornwallis & Porter (1982), Cramp (1988), Evans, M.I. (1994), Jennings (1995), Martins (1986, 1998), Martins *et al.* (1996), Porter *et al.* (1996), Rands *et al.* (1987), Redman (1987), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Varisco *et al.* (1992), Vaurie (1955).

11. Dunnock

Prunella modularis

French: Accenteur mouchet **German**: Heckenbraunelle **Spanish**: Acentor Común
Other common names: Hedgesparrow, Dykie, European Dunnock, Hedge Accentor

Taxonomy. *Motacilla modularis* Linnaeus, 1758, Europe = Sweden.
Forms a superspecies with *P. rubida* and *P. immaculata*. Eight subspecies currently recognized.
Subspecies and Distribution.
P. m. hebridium Meinertzhagen, 1934 – Hebridean Is (W Scotland) and Ireland.
P. m. occidentalis (Hartert, 1910) – Britain (except Hebrides) and W France.
P. m. modularis (Linnaeus, 1758) – breeds N & C Europe E to Urals, S to Alps and Romania.
P. m. mabbotti Harper, 1919 – breeds SC France, Iberian Peninsula, Italy and Greece.
P. m. meinertzhageni Harrison & Pateff, 1937 – breeds S former Yugoslavia and Bulgaria.
P. m. fuscata Mauersberger, 1971 – mountains of S Crimea.
P. m. euxina Watson, 1961 – breeds N & NW Turkey.
P. m. obscura (Hablizl, 1783) – breeds Caucasus region, NE Turkey and N Iran.
Introduced (probably *occidentalis*) in New Zealand.



Descriptive notes. 14·5 cm; 19–20 g. Male nominate race has smoky-grey head, neck, throat and breast; grey-brown cheeks with fine pale streaks; mantle and back warm brown with blackish-brown streaks, rump and tail duller brown and unstreaked; wings blackish-brown, warm brown margins of secondaries and wing-coverts, faint wingbar formed by pale tips of greater coverts; below, grey of chest fades through greyish-white breast to white on centre of belly; breast side and flanks pale brown, streaked blackish-brown, undertail-coverts greyish-buff; iris reddish-brown; bill blackish; legs light reddish-brown. Female is very like male but less richly coloured, with, in particular, head and neck paler with brown wash, mantle less heavily streaked. Juvenile is generally less grey than adult, with general plumage tone buffer, head and underparts heavily streaked. Races differ mainly in coloration: *hebridium* is much darker than nominate, with darker grey head and breast, belly less white, more rufous tone on upperparts and more extensive streaking; *occidentalis* is intermediate between previous and nominate, with more extensive brown on hindneck and crown, no white on belly, darker brown flanks than nominate; *mabbotti* is close to nominate in appearance but darker and greyer, like previous except for paler underparts; *meinertzhageni* differs from last mainly in heavier streaking on mantle, greyer underparts; *euxina* is relatively pale above, lighter grey crown streaked with pale brown, brown (rather than black) streaks on mantle, also underparts more extensively grey, flanks less streaked; *fuscata* is similar to previous but darker, with better-defined mantle streaks, although still greyer than nominate, grey of underparts more extensive with just a little white on vent; *obscura* is brownest race, with buff wash on head, neck and belly, paler brown ground colour and streaks on upperparts, slight white scaling on throat and breast. Voice. Male song, in bouts from exposed perch, rarely in flight, a short (2–4 seconds) but pleasant warble, sometimes surprisingly loud, containing trills and sharply modulated units; male has repertoire of 10–15 phrases, these mixed to form larger number of song types, one type usually sung several times before switching (switching more frequent in context of female attraction than in male-male duels); sharing of songs among neighbouring males results in local dialects. Male also has subsong with different structure. Female produces combination of trills or complex songs in context of mate attraction. Juvenile starts singing in first autumn, full song develops in following spring. Most familiar call "tseep", used for contact outside breeding season by both sexes, loud higher-pitched version as alarm; faint trills also used to maintain contact.
Habitat. Highly variable across range. Occupies scrub and stunted woodland in alpine, subarctic and tundra habitats in N & E; found in montane habitat to just above tree-line in parts of range, including spruce (*Picea*) and larch (*Larix*) forests up to 2200 m in Switzerland, birch (*Betula*), maple (*Acer*) and juniper (*Juniperus*) scrub to 2600 m in Caucasus, and juniper and rhododendron (*Rhododendron*) scrub to 2000 m in Pyrenees. In N of range, found mostly in coniferous, broadleaf and mixed forests, particularly alongside water; in Bialowieza Forest (Poland-Belarus) also in mixed forest, particularly with alder (*Alnus*), ash (*Fraxinus*) and spruce. In W of range, from UK, Belgium and W Germany S to Iberia, mainly in lowlands, exploits managed woodland with thick understorey, hedges and farm woodland, suburban and urban gardens, parks and any other habitat with scrubby vegetation; shift to lowlands from likely ancestral habitat in alpine and subarctic regions unique within family. Introduced populations in New Zealand have successfully colonized scrub and woodland habitats from sea-level to 1600 m.
Food and Feeding. Diet largely arthropods, supplemented by seeds in winter; in Britain, volume of seeds in faeces was 90% in February, 0% in April (52% across year). Household scraps (e.g. suet,

breadcrumbs) also taken. Proportions of different invertebrates in diet vary across range and with season; beetles (Coleoptera, especially of families Carabidae, Curculionidae, Scarabaeidae, Chrysomelidae and Staphylinidae) and spiders (Araneae) generally dominate, but springtails (Collembola), stoneflies (Plecoptera), orthopterans, earwigs (Dermaptera), bugs (Hemiptera), lepidopterans, scorpion flies (Mecoptera), flies (Diptera), hymenopterans, harvestmen (Opiliones), pseudoscorpions (Pseudoscorpiones), small snails and earthworms also taken. Plant food equally diverse, includes seeds of, among others, docks (*Rumex*), legumes, pines (*Pinus*), birch, nettles (*Urtica*), poppies (Papaveraceae), primrose (*Primula*), grasses, sedges (Cyperaceae), willowherb (*Epilobium*) and thistles (especially *Cirsium*); also berries of heaths (Ericaceae), bramble (*Rubus*), holly (*Ilex*) and elder (*Sambucus nigra*). Nestling diet similar to spring-summer diet of adults; coleopterans, dipterans and spiders in 50–75% of faecal samples in Britain; peak in lepidopteran larvae (83%) recorded in Jun; young also fed with seeds, including those of Norway spruce (*Picea abies*) in Russia. Forages chiefly on ground under cover of bushes and other vegetation, by gleaning or sorting through leaf litter; occasionally probes soil; rarely takes prey in flight. In winter, often forages beneath birdtables, but rarely seen on raised platforms. Spends 94% of time in foraging in Jan, 54% in May (more when feeding young). Usually feeds alone; in winter, may gather in small groups at rich food sources.

Breeding. Breeds Mar–Jul over much of range, May–Aug in Russia; two broods, occasionally three, per season. Following account based on detailed study in Cambridge, UK. Mating system variable, in sample of 254 cases monogamy 42%, polygyny 4%, polyandry 30%, polygynandry (2–3 males with 2–3 females) 24% (monogamy, polyandry and polygynandry occur also in low-density populations in Finnish spruce and birch forests); female territories (c. 0·2–0·7 ha) exclusive, defended by one male or, in shared territory (c. 0·3–0·7 ha), by 2–3 males. On shared territory, dominant (*alpha*) male guards and copulates with female, subordinate (*beta*) male competes and sometimes copulates; high copulation rate (0·5–2·5 times per hour), preceded by cloaca-pecking display; female encourages *beta* male to mate. Nest, built by female alone, a cup of twigs, stems, roots, grass and moss, lined with hair, wool, sometimes feathers, placed 0·5–3·5 m above ground in bush, hedge or tree. Clutch 3–6 eggs; incubation by female alone, period 12–13 days; of 264 broods, 8% fed by female alone, 59% by female and one male, 33% by female and two males; male care influenced by share of matings, hence paternity of brood; seeds fed by regurgitation, invertebrates fed bill-to-bill; total rate of nestling feeds varies with mating system, c. 12 per hour for pair-fed brood and c. 15 for trio-fed brood of 10-day-old chicks; nestling period 11–13 days. Productivity per successful brood varies with male care, from 0·8 fledglings (female alone) to 2·4 (female with one male) and to 3 fledglings (female with two males); c. 30% of all breeding attempts and c. 15% of hatched broods fail as a result of predation, including by cats, crows (Corvidae) and mustelids. Brood parasitism by Common Cuckoo (*Cuculus canorus*) rather frequent, c. 2% of nests in UK.

Movements. Resident, altitudinal migrant, partial migrant and total migrant. Fennoscandian, Russian, Polish, N German and other NE populations (nominate race) migrate to Turkey, S Russia, and Mediterranean region from SW Iberia E, including islands, to Israel and N Egypt; passage to N Africa regular, but involves few individuals. Recoveries indicate migration on broad front along NE/SW axis; autumn passage in Aug–Nov, spring return Feb–Apr. SE populations (Crimea and Turkey E to Iran) resident or partially migratory; some local altitudinal movement from Caucasus to Black Sea coast, but race *obscura* recorded as far S as Egypt. Populations in Britain, Ireland and France mainly sedentary, with local dispersive movements rarely exceeding 30 km. Sedentary in Iberia.

Status and Conservation. Not globally threatened. Generally common to very common. Estimated global population 10,500,000–23,200,000 pairs. Russian population estimated at 1,000,000–10,000,000 pairs; in rest of Europe c. 9,500,000–13,100,000 pairs, largest populations being in Britain (2,100,000), Germany (2,000,000) and Sweden (1,500,000). In prime habitat in England (Cambridge) reaches density as high as 640 adults/km²; 40–120 birds/km² in woodland and young plantations, habitats favoured across much of Europe. Population trends variable; in Finland, increased from c. 8000 pairs in 1950s to c. 400,000 pairs in 1980s, this attributed to changes in forest management creating dense scrubby habitat. Recently listed as a species of medium conservation concern in UK because of 25–50% decline in numbers since 1975; no specific factor identified as responsible.

Bibliography. Adamian & Klem (1999), Beklova *et al.* (1984), Bevington (1991), Birkhead (1981), Birkhead *et al.* (1991), Bishton (1985, 1986, 2001), Brooke & Davies (1987), Bull *et al.* (1985), Burke *et al.* (1989), Byle (1987, 1990, 1991), Cramp (1988), Csörgö *et al.* (2001), Davies (1983, 1985, 1986, 1987, 1990, 1992, 2000), Davies & Brooke (1989), Davies & Hartley (1996), Davies & Hatchwell (1992), Davies & Houston (1986), Davies & Lundberg (1984, 1985), Davies, Hartley *et al.* (1996), Davies, Hatchwell *et al.* (1992), Dementiev *et al.* (1968), Dhondt *et al.* (2002), Dunn (1994), Egidius (1998), Étchécopar & Hüe (1964), Giebing (2002), Ginn (1975), Gregory *et al.* (2002), Hagemeijer & Blair (1997), Handrinos & Akriotis (1997), Harrison (1982), Harrison & Binfield (1967), Hartley (2002), Hatchwell & Davies (1990, 1992a, 1992b), Heath *et al.* (2000), Heinroth & Steinbacher (1952), Houston & Davies (1985), Hudde & Vohwinkel (1997), Hüe & Étchécopar (1970), Järvinen & Väisänen (1978), Karanja (1982), Kristin (1989), Langmore (1995, 1996, 1997, 1998), Langmore & Davies (1997), Langmore *et al.* (2002), Lever (1987), Marchant *et al.* (1990), Mauersberger (1971), Moreby & Stoate (2001), Orton (1930), Pons (2001), Ramos & Martí (2003), Reed & Cross (2001), Reichholf (1984), Rollin (1929), Shirihai (1996), Sibley & Ahlquist (1981), Snow, B.K. & Snow (1982), Snow, D.W. & Perrins (1998), Snow, D.W. & Snow (1983), Stepanyan (1990), Svensson (1992), Tellería *et al.* (1999), Tomek (1980, 1988), Tomialojc *et al.* (1984), Torres & Moreno (1997), Tuomenpuro (1989, 1990, 1991), Vaurie (1955, 1959), Weitz (1988a, 1988b), Wiley *et al.* (1991).

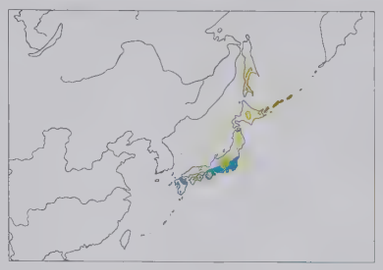
12. Japanese Accentor

Prunella rubida

French: Accenteur du Japon **German**: Rötelbraunelle **Spanish**: Acentor Japonés
Other common names: Japanese Hedge-sparrow

Taxonomy. *Accentor modularis rubidus* Temminck and Schlegel, 1848, Japan.
Forms a superspecies with *P. modularis* and *P. immaculata*. N populations described as race *fervida*, but variation considered insufficient to warrant recognition of geographical races; birds in extreme N (Sakhalin) possibly a distinct race, further study needed. Monotypic.

Distribution. Breeds Sakhalin, S Kuril Is and Japan (S to Shikoku).



Descriptive notes. 15 cm; 19 g. Has chestnut crown and nape, grey edging of nape feathers; ear-coverts cinnamon-brown with fine pale streaks; mantle rich chestnut with black streaks, rump and tail rufous-brown; wing-coverts and flight-feathers darker brown with paler rufous-brown edges; throat to lower belly brownish-grey, flanks with rufous streaks, vent and undertail-coverts rufous-brown; iris brown; bill blackish; legs yellowish-brown. Differs from *P. modularis* mainly in browner general coloration. Sexes alike. Juvenile has buffer tone on upperparts and underparts than adult, head and underside streaked. VOICE. Song, from bush or tree, an inconspicuous trill, "tsee-tsee syuu tsee-tsee-syuu", but few details on vocalizations.

Habitat. In summer, chiefly in thickets and the understorey of pine (*Pinus*), birch (*Betula*) and mixed deciduous forests on mountains, up to tree-line; in Japan 1500–3000 m, mostly above 2000 m in Honshu; breeds in similar habitat but below 1000 m in Kuril Is. In winter, found in forest undergrowth, thickets and riverine scrub, also city parks.

Food and Feeding. Invertebrates; also seeds, primarily in winter. Forages mainly on ground, often beneath bushes and in undergrowth, sometimes at edges of snow patches; occasionally above ground in trees and bushes.

Breeding. Season May–Aug; double-brooded. Female copulates with more than one male, and two males may assist female in feeding single brood; mating system probably similar to that of *P. modularis*, but details lacking. Nest a cup lined with hair, fur and feathers, placed in low bush or dwarf pine. Clutch 3–4 eggs; incubation period 12–13 days; nestling period 11–13 days.

Movements. N breeders migrate S to S parts of Honshu in Oct; mainly an altitudinal migrant in S, but some may winter in N Kyushu. Returns to breeding areas in Apr.

Status and Conservation. Not globally threatened. Fairly common in suitable habitat in Hokkaido, Honshu and Shikoku. No estimates of numbers or population trends available.

Bibliography. Anon. (1974, 2000a), Austin & Kuroda (1953), Brazil (1991), Dementiev *et al.* (1968), Flint *et al.* (1984), Furumaya (1983), Kiyosu (1965), Knystautas (1993), Konno & Fujimaki (2001), Matuzaki (1991), Sonobe (1982), Stepanyan (1990), Vaurie (1959), Yoshida (1998).

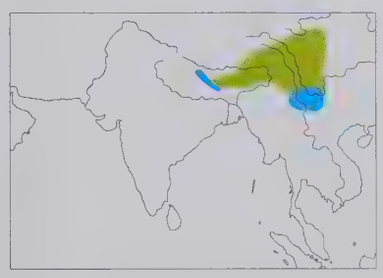
13. Maroon-backed Accentor

Prunella immaculata

French: Accenteur immaculé **German**: Waldbraunelle **Spanish**: Acentor Inmaculado

Taxonomy. *Acc.[entor] immaculatus* Hodgson, 1845, Nepal.
Forms a superspecies with *P. modularis* and *P. rubida*. Monotypic.

Distribution. E Himalayas (E from E Nepal) and S China (SE Xizang E to S Gansu, Sichuan and Yunnan).



Descriptive notes. 14·5 cm; 20 g. Distinctive dark, unstreaked accentor. Has predominantly dark grey head and upper mantle, black lores, some white scalloping on grey feathers of forehead; olive-grey to rich brown back and rump, slaty brown tail; scapulars and wings chestnut, greater wing-coverts grey; grey below, dark cinammon flanks, vent and undertail-coverts; iris pale yellow to whitish; bill blackish, base horn-coloured; legs pale greyish-brown to dull orange. Sexes alike. Juvenile resembles adult but lacks white on forehead, has olive back feathers tipped with black, paler throat spotted, buff breast streaked dark brown, belly and vent paler. VOICE. Song, from perch, described as monotonous, but details lacking; call weak, high-pitched and metallic "zieh-dzit" or "tzip".

Habitat. Humid coniferous and rhododendron (*Rhododendron*) forests, often near water; breeds from c. 2900 m to 5000 m. In winter, also in secondary forest, forest margins and edges of clearings at lower altitudes; 1700–3700 m in NE Indian Subcontinent, to 1500 m in Xizang.

Food and Feeding. Invertebrates and seeds, also some berries. Forages on ground, usually under thick vegetation, seldom in open. Secretive.

Breeding. Few records. Breeds May–Jul. No information on mating system. Nest well hidden, placed low down in bush, sometimes on ground. Clutch 3–4 eggs; no information on incubation and fledging periods.

Movements. Resident, with some altitudinal movement; post-breeding descent, often in parties, to lower elevations, resulting in expansion of range, e.g. into Nepal.

Status and Conservation. Not globally threatened. Generally uncommon to scarce, or rare; not uncommon in Nepal in non-breeding season. No information on density or estimate of abundance. The most secretive member of the family; probably overlooked to some extent. Status uncertain in some areas; possibly a non-breeding visitor in N Myanmar.

Bibliography. Ali & Ripley (1987a), Ali *et al.* (1996), Bangs (1932), Cheng Tsohsin (1987, 2002), Étchécopar & Hüe (1983), Grewal *et al.* (2002), Grimmett & Inskipp (2003), Grimmett *et al.* (1998, 2000), Inskipp & Inskipp (1991), Inskipp *et al.* (1999), MacKinnon & Phillipps (2000), Majumdar *et al.* (1992), Meyer de Schauensee (1984), Ripley (1982), Robson (2000), Shrestha (2000), Smythies (1986), Vaurie (1959, 1972), Zheng Guangmei & Zhang Cizu (2002).

Class AVES
Order PASSERIFORMES
Suborder OSCINES
Family TURDIDAE (THRUSHES)



- Small to medium-sized passerines with fairly strong bill, usually medium-long tail, plumages varying from dull grey or brown to black, and from uniform to spotted and barred, some species with bright colours.
- 11–35 cm.



- Cosmopolitan.
- Most habitats, from dense forest to open country.
- 60 genera, 336 species, 953 taxa.
- 36 species threatened; 2 (possibly 4) extinct since 1600.

Systematics

There was a time in the mid-nineteenth century when the thrushes (Turdidae) were regarded as the most highly evolved of all birds, and they were placed at the beginning or the end of the oscine passerines, the position depending on how the sequence is interpreted. The basis for this arrangement was the combination of two features exhibited by these birds: an undivided planta, or sole of the foot, making them the "best" of perching birds, and highly developed vocal musculature. In 1896, in his great *Dictionary of Birds*, Alfred Newton described this conclusion as revealing "a woeful want of the logical apprehension of the facts", and he went on to argue that, on the contrary, the thrushes and chats are among the "lower members" of the oscines. Part of his evidence was that the turdid brain is small, the brain:body ratio of a Common Blackbird (*Turdus merula*) being 1:67 and that of a European Robin (*Erithacus rubecula*) 1:32, whereas those of the Eurasian Siskin (*Carduelis spinus*) and the Island Canary (*Serinus canaria*) are both 1:14. "The signification of these numbers", wrote Newton, "needs no comment to be understood." He apparently thought that brain:body mensural ratios would open up systematics in the way in which biomolecular studies are now believed to do.

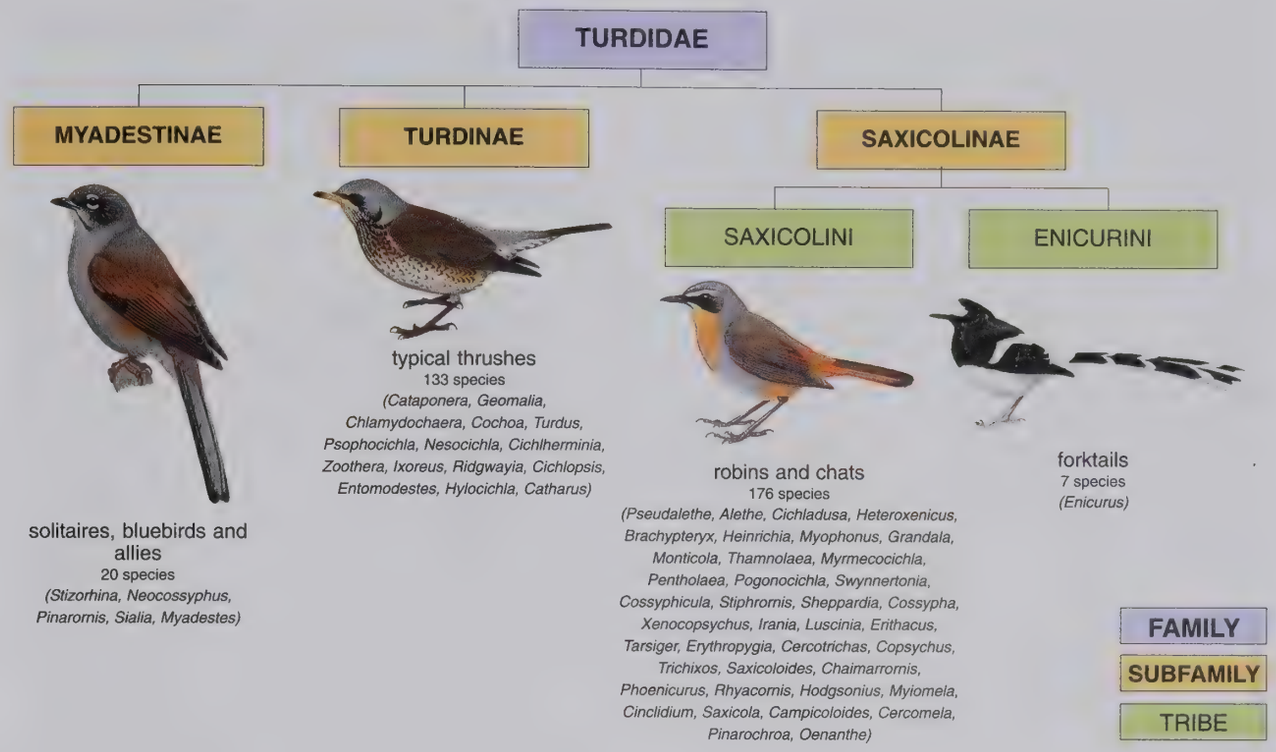
Another century has passed, however, and, although brain:body ratios are very important in understanding the evolution of mammals, the possible significance of these numbers in avian systematics awaits more thorough research. Meanwhile, the placement of the thrushes has long since shifted towards the middle of the oscines.

So, what makes a thrush a thrush? It is not, at any rate, the vernacular name. The first thing to be said is that, because these birds were so familiar to early settlers, explorers, naturalists and systematists, the word "thrush" has been adopted for several look-alike groups which prove to have no true affinity with the family. Among such groups are the waterthrushes (*Seiurus*) of North America and the Wren-thrush (*Zeledonia coronata*) of Costa Rica and Panama, both actually New World warblers (Parulidae), the shrike-thrushes (*Colluricincla*) of Australasia, which probably constitute a family of their own, distantly related to the Turdidae, and the ant-thrushes of the genera *Formicarius* and *Chamaeza*, which are in fact Neotropical ground-antbirds (Formicariidae), not to be confused with the *Neocossyphus* ant-thrushes, which do belong in the Turdidae. Further examples include the laughingthrushes and jay-thrushes (*Garrulax*), which are Asian babblers (Timaliidae), the quail-thrushes (*Cinclosoma*) of Australasia, placed in their own monogeneric family (Cinclosomatidae), and the New Zealand Thrush (*Turnagra capensis*), perhaps more usually known as the Piopio, the systematic placement of which is uncertain. Among other such examples, it is worth mentioning that the Old World pittas (Pittidae) were often referred to as "jewel-thrushes" and the North American mockingbirds (Mimidae) as "mocking-thrushes". Even the name "thrasher", applied to four genera of mimids, is derived from the word "thrush", alluding to the often plain brown upperparts and speckled underparts of the species in question which, in one in-



Thrushes are arranged into three subfamilies. Allocating each genus to the right subfamily is often straightforward, but several less tractable forms are subject to unsettled treatment, with disputes over their true relationships, sometimes even at the family level. One such is Stizorhina, *which contains two thrush-sized but flycatcher-shaped African species, with short bills and legs, upright posture, and a habit of flicking the tail outwards. According to genetic analysis they fall well outside the typical thrushes, but cluster with New World solitaires* (Myadestes). *These data support the retention of the* ***Rufous Flycatcher-thrush*** *within Turdidae, and its placement in the subfamily Myadestinae.*

[*Stizorhina fraseri rubicunda*, near Limbe, Dikolo, Cameroon. Photo: Doug Wechsler/ VIREO]



Subdivision of the Turdidae

[Figure: Douglas Pratt, Norman Arlott, Hilary Burn, Tim Worfolk]

terpretation of the name, made them appear "thrusher", or more thrush-like, than a true thrush.

In some cases, the appellations were clearly intended merely to signify resemblance, whereas, in other instances, they implied both resemblance and affinity to the thrushes. For example, some of the Australasian taxa mentioned above were for many years included in the thrush family, as were the scrub-robins (*Drymodes*) of that region. Over time, membership of the Turdidae has been pared back, but there are still many fuzzy edges which remain intriguing and problematic, although, in recent years, DNA analyses have started to produce important clarifications, as well as some new uncertainties.

The family as currently constituted is by no means the most recently supported arrangement, but it extends the life of the long-held view that the thrushes and the chats form two major subfamilies within a single family. The first of these subfamilies, the Turdinae, comprises for the most part relatively large, longish-tailed, forest passerines and is dominated by the genera *Zoothera*, *Turdus* and *Catharus*, while the second, the Saxicolinae, is made up mostly of small to medium-sized, bright-tailed, open-country passerines, dominated by the genera *Monticola*, *Sheppardia*, *Cossypha*, *Luscinia*, *Phoenicurus*, *Saxicola* and *Oenanthe*. This view remains attractive owing to the plumage and/or structural resemblances of certain species and genera across the subfamilial divide, as illustrated by, for example, the nightingales (*Luscinia*) and nightingale-thrushes (*Catharus*), or the Chestnut-capped Thrush (*Zoothera interpres*) and Chestnut-naped Forktail (*Enicurus ruficapillus*). Nevertheless, the results of biomolecular work carried out by C. G. Sibley and J. E. Ahlquist, E. Pasquet and co-workers, F. K. Barker and co-workers, and P. Beresford now suggest that the chats are, in fact, close enough to the Old World flycatchers (Muscicapidae) to be included either as a subfamily within or as a component of the latter, so that their supposed affinities with the true thrushes may be merely, or more of, a matter of convergent evolution. This finding is not entirely unexpected. It is worth remarking that R. A. C. Jensen and M. K. Jensen, in a 1970 study, reallocated the Herero Chat (*Namibornis herero*) to the flycatchers, a relationship reinforced by recent biomolecular work. These authors concluded that "separation of chats and flycatchers at the family level is unrealistic".

This is not to say, of course, that the thrushes and chats are not closely related. Both groups conform to certain characters which indicate a common ancestry, albeit often shared with the Old World flycatchers. Thrushes and chats are generally fairly slim and tapered, yet robust-bodied, and have a strong, sharp, straight bill which is often rather broad-based and usually just more than half the length of the head; they also possess rather large eyes, fairly sparse medium-length rictal bristles, a blade-tipped tongue, medium-length legs with strong toes, mainly rounded wings, and a squared-off or slightly rounded tail. Perhaps most crucially, they share with the Old World flycatchers two important features: a cryptic spotted juvenile plumage, although in some chat species this is reduced dramatically to slightly rusty edges of the wing-coverts, and a distinctive derived condition of the syrinx known as the "turdine thumb".

As with most oscines, there are ten primaries, of which P10 is often short, and twelve or, very rarely, ten or 14 rectrices. The legs are booted or "holothecal", in other words plain, without divisions on the surface, a feature not shared with the Old World flycatchers, and the feet are anisodactylic, with three toes pointing forwards and one to the rear, and acutiplantar, the hind toe angled sharply from the tarsus; in a few genera of chats, juveniles have scutellate tarsi. The flight is usually undulating, and almost all species are adapted to both terrestrial activity, involving running and/or hopping, and off-ground perching.They are thus capable of exploiting rather broad niches, foraging on the ground, in the soil and leaf litter, and in vegetation, and feeding predominantly on invertebrates but also, often for extended periods, on fruit (see Food and Feeding). This adaptive plasticity in behaviour is undoubtedly responsible for the family's almost unparalleled success.

Turdids are almost always territorial and monogamous, having songs that are commonly rich and melodious. The nests of turdine thrushes are typically tightly woven cups, often strengthened with mud, placed in a tree or bank, and the clutch size is of 2–6 eggs; chat nests are often rather untidy structures, built on or near the ground or placed in rock or tree crevices, in which clutches of 2–8 eggs are laid. In both subfamilies, it is almost always only the female that builds the nest and incubates the eggs. The eggs are mainly pale blue, greenish-blue or blue-green, sometimes plain but usually with reddish-brown speckling and mottling; egg coloration, however, is related largely to nest type, and is generally of little reliable taxonomic value. Turdid nestlings are typically covered in long scanty down, but those of a few species are naked; cup-nest youngsters commonly leave the nest a few days before they are able to fly. There is a single annual moult, following breeding; a small number of species have a partial pre-breeding body moult, but in the great majority breed-



The peculiarities of the ***Boulder Chat*** *once led to its inclusion in the babbler family, Timaliidae. On the basis of shared features it is now treated as a turdid allied to African ant-thrushes* (Neocossyphus) *and flycatcher-thrushes* (Stizorhina), *as well as the Nearctic bluebirds* (Sialis), *in the Myadestine clade. It has rather specialized habitat requirements, being restricted to granitic outcrops in south-central Africa, where it usually occurs on lower slopes with large boulders and trees. It shuns both open, rocky areas and dense vegetation, instead favouring boulder-strewn sites under a wooded canopy.*

[*Pinarornis plumosus*, Stone Hills Game Sanctuary, Matobo, Zimbabwe. Photo: J. R. Peek]

ing plumage is acquired by abrasion. Sexual dichromatism is common, possibly owing to the predominance of female attendance at the nest.

The most significant deviation from this generalized account of the family is found in a small, geographically diverse group of birds which are, except for two species, almost exclusively arboreal and which lack several key characters mentioned in the above list (no spotted juvenile plumage; typical oscine syringeal morphology). These are the ant-thrushes (*Neocossyphus*) and the flycatcher-thrushes (*Stizorhina*) of Africa, and the solitaires (*Myadestes*) of Hawaii, North and Central America and the Caribbean. *Myadestes*, a uniform genus of small, upright-perching birds with a short, rather wide bill, typically with predominantly grey plumage, with silvery or pale grey in the tail and an oblique dull wingbar, has long been a puzzle to systematists, who have sought to relocate it within the silky-flycatchers (Ptilogonatidae) or the waxwings (Bombycillidae). Nevertheless, field observations on the Black-faced Solitaire (*Myadestes melanops*) by P. Slud led him to remark perceptively that, "despite its different appearance and proportions, its behavior and attitudes suggest a semi-terrestrial thrush become adapted to arboreal life".

DNA analyses by Pasquet, A. Cibois and co-workers reveal that, despite superficial differences between the terrestrial *Neocossyphus* and the flycatcher-like *Stizorhina*, these two genera and *Myadestes* are all closely related and, moreover, group at some distance phylogenetically from the typical thrushes, supporting their separation in a third subfamily, the Myadestinae. Into this subfamily are added two further genera. The first contains the bizarre, little-studied Boulder Chat (*Pinarornis plumosus*) of southern Africa, which was once thought to be a babbler but which shows certain traits allying it compositely to *Neocossyphus* and *Stizorhina*; these traits are a stippled throat, a patch of colour in the primaries and on the distal outer tail, an elongate body and tail, an unspotted juvenile plumage, and absence of the turdine thumb. The second genus, *Sialia*, contains the North American bluebirds, another small, anomalous group of three flycatcher-like species which are evidently remote from the true thrushes. Although the bluebirds possess a spotted juvenile plumage, very recent biomolecular studies by J. Klicka and colleagues indicate that they are closer to *Myadestes* than the latter is to *Neocossyphus*. On the other hand, another genus bearing the English name of "solitaire", *Entomodestes*, appears, on behavioural and molecular evidence, to reflect convergence on, not true proximity to, *Myadestes*, and along with the monotypic *Cichlopsis*, also a "solitaire", is retained in the Turdinae.

Pinarornis and *Myadestes* share the habit of nesting on or very near the ground, but at present there is too little evidence to demonstrate the robustness of the current arrangement, whereby *Stizorhina*, *Neocossyphus*, *Pinarornis*, *Sialia* and *Myadestes* are united in their own "primitive" subfamily. This grouping of genera may prove to be paraphyletic, although it is, nevertheless, largely in line with the suggestion of S. L. Olson, with the exception that *Sialia* is added and *Modulatrix*, now judged to be related to the rockjumpers (*Chaetops*), a genus of uncertain affinities, removed.

The recent transfer of the thrushes of the Hawaiian Islands from their own genus, *Phaeornis*, to *Myadestes* has been widely corroborated by osteological and genetic studies, but it is intriguing that only one mainland species of *Myadestes*, Townsend's Solitaire (*Myadestes townsendi*), today undertakes migrations of a type which might have led to the colonization of so distant an oceanic archipelago. Two species in the Caribbean, however, indicate the over-water dispersal abilities of the genus. The songs of the Cuban Solitaire (*Myadestes elisabeth*) and the Rufous-throated Solitaire (*Myadestes genibarbis*) are similar to each other, and different from those of others in the genus, so that these two species are evidently closer to each other than they are to their congeners. They perhaps reached their homes as a result of two invasions of a single, now extinct continental species.

The Turdinae and the Saxicolinae represent two huge subfamilies to which most genera can be allocated on fairly straightforward evidence, commonly to do with their perceived relationships to certain "anchor" genera within the respective groups. Very recent investigations of nuclear and mitochondrial DNA sequences in many of the more obscure genera are now shedding light on the distribution of these genera within the subfamilies, and some new, albeit reassuring, alignments are resulting. Sibley and B. L. Monroe's surprising placement of *Alethe* and *Brachypteryx* in the true thrushes is now overturned, and these genera, along with those recently split from them, are regrouped under the saxicoline chats. The relationships only of *Geomalia* and *Cataponera* remain frankly indeterminate, but these two are, for the time being, treated as primitive thrushes and placed next to *Chlamydochaera* and *Cochoa*. It needs to be stressed that



One recurrent characteristic of turdids is a distinctly speckled juvenile plumage, as illustrated by this young ***Austral Thrush*** *standing close to its parent. This type of juvenile crypsis is reduced or absent in a few chats, but otherwise universal within the family. It might have helped to bind the family taxonomically as a single entity, were it not for its reappearance in an allied assemblage, the Old World flycatchers (Muscicapidae). Indeed, a growing body of evidence suggests that chats may be better grouped with the Muscicapidae, and only thrush-like by convergence. This is but one example of major shifts in avian systematics, driven by new genetic data, but far from resolved.*

[*Turdus falcklandii falcklandii*, Carcass Island, Falklands. Photo: Tui de Roy/ The Roving Tortoise]

none of these subfamilial allocations is set in stone, and the present sequence is governed mainly by the sharing of characters that may have little or no phylogenetic relevance but which, in the absence of more informed analysis, provide a degree of continuity. Thus, the fact that *Grandala*, *Myophonus* and *Monticola* are blue-plumaged species has in the past been judged as reflecting their close relationship; this potential link is retained, as there is no clear evidence to indicate where they may otherwise be placed.

Bearing in mind the above caveats, the Turdinae subfamily begins with two species, the Sulawesi Thrush (*Cataponera turdoides*) and the Geomalia (*Geomalia heinrichi*), which may not, in fact, be true thrushes. These two species are endemic on the island of Sulawesi, in Indonesia, and typify the peculiarity of that island as the intermediary between two great biogeographical regions. Both scientific names betray their describers' sense that these species were not thrushes. In the first instance, *turdoides* means "thrush-like" but, by implication, not "the genuine article", and repeats the generic name of a widespread group of babblers; in the second, *Geomalia* means "ground malia", the Malia (*Malia grata*) being another Sulawesi endemic most frequently placed in the Timaliidae, the babbler family. There is deep uncertainty about these two extraordinary animals, which exhibit both turdine and timaliine characters, giving rise to the notion that they may be primitive relations of both families. Their placement in the thrushes is based in part on the fact that juveniles of both possess a lightly spotted plumage, a feature not found among the babblers.

Until recently, the cochoas were regarded as oversized chats, but they have now been recognized as true thrushes on the basis of nuclear and mitochondrial DNA sequences. Their remarkable coloration and primitive songs, the latter merely long whistles, suggest a very isolated and probably ancient group, with relict populations scattered through the mountains of Asia from the Himalayas to eastern China and from Indochina to Sumatra and Java. In Borneo, there are no cochoas but, instead, the mysterious Black-breasted Fruithunter (*Chlamydochaera jefferyi*), which was for long thought to be a cuckoo-shrike (Campephagidae) related to the *Lalage* trillers, although it also demonstrates behavioural features suggesting a bulbul (Pycnonotidae), a laughingthrush (Timaliidae) and an oriole (Oriolidae). Recent separate anatomical and biochemical analyses, however, indicate that it is, in fact, a thrush, fairly close to *Cochoa* in genes, structure, appearance and ecology; the cochoas, too, are "fruithunters". The jigsaw-like fit of *Chlamydochaera* between *Cochoa*, in Sumatra and Java, and *Cataponera* and *Geomalia*, in Sulawesi, is convenient, and offers a plausible token of relationship among the four genera.

These intriguing cases from tropical Asia raise the question of the geographical origins of the thrushes and chats. The great majority of species and genera are found today in the Old World. Disallowing the boreal overlaps exhibited by a handful of species, only 68 of the 336 species, just 20%, and eleven, or 18%, of the 60 genera currently recognized are found in the Americas, the latter taken to include Hawaii and Tristan da Cunha. Of the remainder, the great majority are fairly evenly divided between Africa and Eurasia, but with Eurasia slightly ahead, although the scores are blurred by species shared between the two, either as migrants or as residents, and depending on whether north Africa is counted zoogeographically as "Asian". Africa has 101 endemic species and 18 endemic genera, compared with respective totals of 133 and 16 for Eurasia, leaving 26 species shared evenly between the two landmasses as widespread breeders, and five in Australasia. A further species occurs in both Asia and Australasia, another in those two continents and also the south-west Pacific, and one other in Eurasia, Africa and North America. The greatest geographical concentration of turdids appears to be in the Himalayas, where the radiations of *Turdus*, *Zoothera*, *Tarsiger* and *Phoenicurus* are striking. Radiations do not, however, give wholly reliable clues to origins, but in general the balance of likelihood may be that the family arose in Asia around the time of the formation of the Himalayas and rapidly spread through Eurasia and into Africa, making slower progress via what is now the boreal Siberia–Alaska (Bering bridge) connection to reach America.

Without question, *Turdus* is the most successful genus of the family, and indeed, in terms of natural geographical penetration and degree of speciation, perhaps the most successful of any passerine genus in the world. Now that the Varied Thrush (*Ixoreus naevius*) and the Aztec Thrush (*Ridgwayia pinicola*) are no longer treated in *Zoothera*, *Turdus* is the only thrush genus which has become established throughout Africa, Asia and the Americas, and the only one which breeds in the Oriental, Afrotropical, Palearctic, Nearctic and Neotropical Regions. Of its 70 species, eight are confined to Africa, 25 are essentially Asian, and 34 are restricted to the Americas. Despite the elevated number in the

last region, where all except one are in the Neotropics, a New World origin of *Turdus* is implausible. What seems to have happened is a north–south penetration of the American continents by two main turdine ancestors, one giving rise to the endemic New World genus *Catharus* mainly in North and Middle America, and one, *Turdus*, resulting in the widespread occupation of North American secondary habitats by a single species, the American Robin (*Turdus migratorius*), and an equally widespread occupation of South America involving a radiation into two main groups. The first of these two groups consists of large, relatively uniform-plumaged and mainly montane, Andean, species, including, incidentally, two that were previously separated, on the basis of the broader bill, in *Platycichla* but have very recently been shown by Klicka and colleagues to belong in *Turdus*. The second group comprises more typical, mainly lowland thrushes, brown above, and with a streaked throat and whitish vent. The Neotropical species exhibit a constant difference from Palearctic species in having rounder wingtips, reflecting their far more sedentary behaviour, and they have a wider bill than that of Palearctic and Oriental species, suggesting a greater frugivorous habit or, at least, a habit of eating larger fruit.

The Neotropical radiation of *Turdus* is notable for the contrast that it makes with the situation in the Australasian and western Pacific islands. South America is widely known as the "bird continent", yet there was ecological space enough for 33 species of *Turdus*. In Australasia and the Pacific, however, the family's most pioneering species, the Island Thrush (*Turdus poliocephalus*), is very patchily distributed both geographically and altitudinally. J. M. Diamond, who examined the situation on ten islands occupied by this species, observed that it is always confined to avian communities which contain around 30 or fewer species, the range being 23–36 species, with an average of 31, which suggests that it is unable to compete in richer communities. On large, species-rich islands, such as New Guinea, the decline in diversity with elevation yields forest communities of 30 species or fewer only above 2750 m, but the elevational boundary for such levels of diversity lowers progressively with size and remoteness of island. On tiny Tolokiwa, west of New Britain, for example, the Island Thrush appears at 750 m, where the complement has decreased from 40 at sea-level to 23. Inability to compete seems a strange condition for a genus which has proved so successful in South America.

It would be of interest to examine whether the extraordinary degree of plumage variation displayed by the Island Thrush correlates with such variables as elevation and species diversity. A striking feature of the genus *Turdus* is its apparent homogeneity, resulting in recurrent appearances of particular phenotypes: all-black plumages, dark brown plumages and brown-backed, grey-hooded and rufous-breasted plumages appear repeatedly in *Turdus* across its wide range. Even relatively anomalous species can find an unexpected image of themselves, such as West Africa's Gulf of Guinea Thrush (*Turdus olivaceofuscus*) and Peru's Maranon Thrush (*Turdus maranonicus*), or at least a striking homology, as in the case of the White-collared Thrush (*Turdus albocinctus*) of the Himalayas and Rufous-collared Robin (*Turdus rufitorques*) of Central America; and even when appearances may suggest a long isolation, voice can indicate a rather taut assemblage, as in the case of the Gulf of Guinea Thrush, which in some of its phrasings sings very much like the Olive Thrush (*Turdus olivaceus*). Songs of *Turdus* thrushes are not all inspirational, but in general song in this genus is as highly developed as it is in any other in the family and, indeed, in any family of birds; several species are commonly judged to produce what are among the finest songs known to human ears (see Voice, Relationship with Man).

Immediately following the *Turdus* sequence are several species whose outward appearance lays claim to individual generic recognition for each. These are the Tristan Thrush (*Nesocichla eremita*) of Tristan da Cunha, the Forest Thrush (*Cichlherminia lherminieri*) of the Lesser Antilles, and the Groundscraper Thrush (*Psophocichla litsitsirupa*) of mainland Africa. Of these, the least differentiated genetically, according to the findings of Klicka and colleagues, is the Tristan Thrush, which resembles the juvenile of the Austral Thrush (*Turdus falcklandii*), geographically its closest relative. The Tristan Thrush's tongue, however, has evolved a bristled tip to assist it in sucking the eggs of seabirds, and on this basis it seems appropriate to retain the species in its own genus. The same dataset indicates that both *Cichlherminia* and *Psophocichla* are close to *Turdus*, with *Psophocichla* at the same genetic distance from *Turdus* as are several *Zoothera* species; indeed, *Psophocichla* possesses plumage characters that ally it with both these genera.

The genus *Zoothera* is almost as successful as *Turdus* in its geographical spread, and is the only thrush or chat genus having a natural range in Australia, but it is unestablished in the Ameri-



With 70 species distributed in all continents bar Antarctica, Turdus *is the most successful genus in the family, outstripping virtually all other avian genera in its ability to reach far-flung scraps of land, and there diversify. This propensity is best illustrated by the* ***Island Thrush****, a "supertramp" with no less than 49 extant races spread from Sumatra to Samoa. These taxa thrive on islets and mountaintops with depauperate avifaunas, dropping out in more diverse habitats. The race endemic to Christmas Island is relatively dull, but morphological variation throughout the complex is extreme.*

[*Turdus poliocephalus erythropleurus*, Christmas Island, Indian Ocean. Photo: Jean-Paul Ferrero/ Auscape]

For much of their taxonomic history the ***Rufous-throated Thrush*** *and the* ***Black-throated Thrush*** *have been lumped as a single species, the "Dark-throated Thrush". Although they freely interbreed where their ranges meet, producing fertile offspring, they are retained as separate species on the grounds that the hybrid zone is relatively narrow, and either side of this zone the two forms are immediately identifiable by a range of vocal and phenotypic characters, not least the colour of their throats.*

[Left: *Turdus ruficollis*, Osaka, Japan. Photo: Hirozo Maki.

Right: *Turdus atrogularis*, Sayh, Musandam, Oman. Photo: Hanne & Jens Eriksen]





cas. Klicka and colleagues' recent biomolecular evidence, however, suggests that the "scaly thrush species complex", comprising the Common Scaly Thrush (*Zoothera dauma*) and its close relatives, among which are the Long-tailed (*Zoothera dixoni*), Plain-backed (*Zoothera mollissima*) and Dark-sided Thrushes (*Zoothera marginata*) and all Australasian forms, is independently derived, rendering the genus as currently constituted polyphyletic and in need of revision. This is a surprising finding, given that a fairly robust character uniting species in the genus, including taxa in the "scaly thrush complex", is a broad underwing stripe. Moreover, this complex shares with many other *Zoothera* thrushes various traits which, taken together, would certainly seem to imply a single ancestor; these include highly reclusive behaviour, confinement to wet forest interiors, markedly terrestrial foraging habits, and usually simplified, minimized songs. Furthermore, the females and juveniles of the Pied Thrush (*Zoothera wardii*) and the Siberian Thrush (*Zoothera sibirica*), two species outside this complex, have patterned plumage which is strikingly similar to that of the "scaly thrushes".

A key feature of all African *Zoothera* and many Asian ones, present in reduced form in some "scaly thrushes", is a double row of wing spots formed by pale tips of the median and greater upperwing-coverts. Another frequent feature in this genus is a facial pattern that involves parallel dark vertical bars below the eye and along the rear ear-coverts; this, too, is seen in reduced or vestigial form in several "scaly thrushes". Six of the seven African *Zoothera* have orange underparts, as do three of the Asian species, suggesting a link between the continents, and this is reinforced by the remarkable homology of the seventh African species, the Spotted Ground-thrush (*Zoothera guttata*), and Sri Lanka's Spot-winged Thrush (*Zoothera spiloptera*). More distantly related, but by their wing spots clearly so, are the small, handsome *Zoothera* of the wider Sundaic region, which represent a distinct radiation. *Zoothera* thrushes are fairly strictly adapted to ground-foraging in thick forest, and this may explain their rather different body proportions from those of *Turdus*; they are on average shorter-tailed, the tail of most species being 60–74% of the wing length, compared with 70–90% in *Turdus*, and they have a longer bill, equivalent to 19–31% of the wing length as against 11–16% in *Turdus*. Most of the Sundaic species exhibit the same intensely secretive habits as their congeners, but on some islands their inhibitions have been lost. On Flores, for example, the Chestnut-capped Thrush sings from village-hut roofs. Indeed, the song of these red, black and white thrushes is remarkably well developed for *Zoothera*, leading to the heavy exploitation of these species in the bird trade (see Status and Conservation).

Until recently, the Varied Thrush and the Aztec Thrush, species which occupy the mountains of western North and Middle America, were treated in *Zoothera*, largely because they share the bold stripe on the underwing and possess relatively primitive songs. Recent biomolecular work does not closely ally these two taxa but, somewhat unexpectedly, links both to other North American thrushes. Each of these species, and particularly the Aztec Thrush, possesses distinctive plumage features which suggest that assignment to monotypic genera is appropriate; indeed, if they are not *Zoothera*, such treatment would seem essential, since it is clear that neither can be allocated to any current American genus. More detailed analysis may determine whether they relate more to Old World or to New World lineages, between which they are presently placed along with two genera of solitaires, *Cichlopsis* and *Entomodestes*. Several DNA studies have indicated that these last two are convergent on, but entirely unrelated to, "true" solitaires, a notable finding and one which bolsters the possibility that *Ixoreus* and *Ridgwayia* are similarly merely convergent on *Zoothera*.

The rather small, spot-breasted thrushes of America south to the northern Andes constitute a uniform group commonly treated under a single genus, *Catharus*, or divided between two genera, *Catharus* and *Hylocichla*. Debate has washed back and forth over the validity of *Hylocichla*, although it is now widely acknowledged that, if applicable at all, it delineates one species only, the Wood Thrush (*Hylocichla mustelina*). Arguments in favour of the retention of this genus include the Wood Thrush's fairly strong differences in plumage, skeletal structure and behavioural repertoire; arguments against its retention stress that other genera, such as *Turdus*, exhibit greater plumage and skeletal variations, and the fact the behavioural repertoire, sampled sufficiently, is widely shared among other members of this group.

Even so, biomolecular studies tend to indicate that *Hylocichla* is fairly well removed from *Catharus*, and on fine balance it seems better to retain the genus. S. D. Ripley thought that *Catharus* and *Hylocichla* evolved from a second wave of turdine invasions of the Americas, following the one that gave rise to *Cichlherminia* and prior to those involving, as he judged it, *Zoothera* and then *Turdus*. He speculated that *Catharus* thrushes were, in their behaviour and vocalizations, intermediate between the Old World nightingales (*Luscinia*) and true thrushes, but their physical resemblances to the former, which are probably more responsible for the epithet "nightingale-thrush" than are their not always arresting songs, are presumably due merely to convergence. Nevertheless, the painstaking R. Ridgway placed *Catharus* and *Hylocichla* close to the Old World *Erithacus* and *Luscinia*.



Zoothera thrushes are fairly strictly adapted to ground-foraging in thick forest, a specialization which seems to alter the optima for body proportions, resulting in shorter tails and longer bills than most Turdus *thrushes. They are also more dramatically patterned, with a higher incidence of bold scaling or barring. The* ***Common Scaly Thrush*** *seems to fit this general theme rather well, and it therefore comes as some surprise that recent genetic work shows it, and its allies, to be independently derived, rendering the genus polyphyletic and in need of revision. Nevertheless, the "scaly thrush complex" is best retained in* Zoothera *until corroboration of its true position is forthcoming.*

[*Zoothera dauma toratugumi*, Isekawa, Japan. Photo: Hirozo Maki]

The composition and sequence of the third subfamily, Saxicolinae, containing the chats and allies, have always been unstable, and the sequence is likely to remain so for many years yet. Recent independent biomolecular studies by Cibois and colleagues, G. Voelker and G. M. Spellman, and Beresford, much of these still unpublished, have helped to establish that genera such as *Myophonus* and *Monticola*, despite their respective vernacular names of "whistling-thrush" and "rock-thrush" — which are perhaps as much the product as the driver of their long-term classification as true thrushes — belong, in fact, with the chats, along with the shortwings (*Brachypteryx*).

Work on the alethes, carried out by Beresford, has tended to corroborate the notion of a monophyletic "African forest robin assemblage", including the alethes, as proposed 30 years ago by M. P. S. Irwin and P. A. Clancey and supported by, first, H. E. Wolters and, later, F. P. Jensen. Beresford also established the polyphyletic nature of *Alethe*, which she remedied by the erection of *Pseudalethe* for the four uncrested, shorter-legged, dull-patterned species. She further established that these two genera are not close to each other, and that *Alethe* is marginal to the main forest-robin assemblage; pending clarification of their relationships, however, they are currently treated side by side.

Apparently, no DNA research has been undertaken on the three African palm-thrushes in the genus *Cichladusa*, but the traditional view has been to group them with the chats, irrespective of their English name. They have been considered close to both *Alethe* and *Cossypha* but, unlike any African forest robin, they construct mud nests. This factor seems unlikely to be a strong guide to their phylogenetic relationships, but, in the absence of biomolecular analysis, it is a hint that the genus may be far removed from the forest robins. The close association of two species with palm trees is also suggestive of a very different ecological and evolutionary history. On this admittedly weak basis, they are in the present treatment removed to a position outside the main connective sequence of saxicolines.

In Asia, there are several highly discrete genera the status of which has been unclear. The shortwings (*Brachypteryx*) are notable curiosities, with their mouse-like terrestrial habits involving running, rather than hopping, their extreme reclusiveness, their powerful songs and their disclosable white loral spots or brows, the last-mentioned feature recalling the African genera *Pogonocichla* and *Sheppardia*. Early DNA studies apparently overturned the general opinion that they are primitive chats, but later ones have restored them to this position. The degree of uniformity within the genus is, however, now less certain. One species is so distinct in both plumage and voice from other *Brachypteryx* that P. C. Rasmussen has referred it to a monotypic genus; this is Gould's Shortwing (*Heteroxenicus stellatus*). Another taxon, hitherto known as *Brachypteryx major*, the "White-bellied Shortwing", has been judged by her to represent two species, both belonging in the chat genus *Myiomela*: these "new" species are the Nilgiri Blue Robin (*Myiomela major*) and the White-bellied Blue Robin (*Myiomela albiventris*). The Great Shortwing (*Heinrichia calligyna*) of Sulawesi, although often treated in *Brachypteryx*, merits retention in its own genus mainly for its striking size difference.

Two important genera, both of which are generally now judged to be chats despite their English names, are *Myophonus*, the whistling-thrushes, and *Monticola*, the rock-thrushes. These two, taken together with the anomalous Grandala (*Grandala coelicolor*), possibly represent, as *Brachypteryx*, early and heavily modified offshoots of the chats. The whistling-thrushes are particularly puzzling. Large, chunky, dense-plumaged and tough-skinned streamside birds with plush frontal feathering, an iridescent forehead and/or "shoulders" and sometimes other parts, powerful black legs, a hook-tipped bill and, in all except two species, unstreaked juveniles, they form a strongly homogeneous radiation with no obviously close relatives. Nevertheless, their dark blue coloration provides a weak basis on which to group them with other genera in which blue is dominant, such as *Grandala*, *Monticola* and the shortwings, notably *Heinrichia*, which J. Delacour judged to be their closest relative.

Superficially, the Grandala is so odd that it was once even placed in its own family, Grandalidae, and considered by some to be closer to the starlings (Sturnidae) than to the thrushes, or, if a thrush at all, to be most closely related to the bluebirds in the myadestine genus *Sialia*. Its most obviously distinguishing feature, however, is the pronounced elongation of the primaries and shortening of the secondaries, producing a highly aerodynamic wing for long-distance high-elevation nomadism; indeed, among passerine birds, only the swallows (Hirundinidae) surpass it in wing-tip length. This and other unusual features, such as its gregariousness, can now be seen as adaptations to an extreme environment, and not necessarily as signs of profound phylogenetic



*The **Varied Thrush** breeds in dense forests of the western seaboard of North America, from Alaska to California. It has some remarkable plumage features, not least of which is the existence of a rare grey and white morph. Until recently it was merged with* Zoothera*, but the results of biomolecular studies imply that it is more proximately allied to other New World thrushes, such as* Catharus*. As such, its resemblance to* Zoothera *is perhaps merely convergent, though why this convergence should extend as far as the dramatic underwing pattern is difficult to explain. Be that as it may, on the basis of these findings it is now placed in the monotypic genus* Ixoreus*.*

[*Ixoreus naevius*, Washington, USA. Photo: Dave Maslowski/ Maslowski Productions]

isolation. Recent DNA evidence that the Grandala belongs with the true thrushes in the subfamily Turdinae cannot be dismissed lightly. On the other hand, it exhibits such likeness in female plumage pattern to certain female saxicoline chats, such as the rock-thrushes and even *Rhyacornis*, that in the present treatment it is very provisionally retained as an anomalous chat with no very obvious relatives.

The plumage pattern of the rock-thrushes serves as a bridge to the various species and genera of chat which have a blue or bluish hood, rufous underparts and blue or rufous in the tail. R. Meinertzhagen argued that the genus arose in Asia and subsequently invaded Africa in several waves during glaciation cycles, leaving behind several speciating populations. He judged the Miombo Rock-thrush (*Monticola angolensis*) to be derived from the Blue-capped Rock-thrush (*Monticola cinclorhynchus*), and the Cape Rock-thrush (*Monticola rupestris*) from an early invasion of the Blue Rock-thrush (*Monticola solitarius*); all other African species he believed to be derived from the Common Rock-thrush (*Monticola saxatilis*), of which, indeed, he considered them to be still no more than subspecies. Meinertzhagen posited that, in later glaciations, the Blue Rock-thrush took refuge in south-eastern Asia and then reinvaded the continent northwards and westwards. He did not, however, consider the Malagasy species, which, owing partly to their size and partly to their more arboreal behaviour, have often been treated under a separate genus, *Pseudocossyphus*. Their existence does not undermine his hypothesis of an Asian origin, but it does complicate it: the four Malagasy species resemble the Little Rock-thrush (*Monticola rufocinereus*) in size and the Sentinel Rock-thrush (*Monticola explorator*) in pattern, and presumably radiated from an invasion of the latter.

Common and Little Rock-thrushes have the habit of quivering the tail, suggesting a link to the redstarts (*Phoenicurus*), and tending to validate Meinertzhagen's assessment of the origins of *Monticola*, even if his views of relationships are not reflected in the current species sequence. D. Lack also believed redstarts and rock-thrushes to be close relatives. In plumage, however, the rock-thrushes show some affinity, perhaps merely convergent, with Africa's two *Thamnolaea* cliff-chats, and they occupy the same rocky, hilly habitat as the latter. At least one of the cliff-chats is a typical, but not obligate, user of old mud nests of hirundines, and both are often considered congeneric with *Myrmecocichla*. The *Myrmecocichla* species, however, mostly dig their own holes for nesting, and they have a very upright stance, with a very short but often cocked tail, a curious low buzzing flight, and highly simplified songs. Closely related to both genera, and again often subsumed in *Myrmecocichla*, is *Pentholaea*, consisting of two relatively small, more arboreal "black-chats" which often nest in tree holes. They lack the white wingpanels of *Myrmecocichla*, are more "normal" in shape, and have more elaborate songs. There is a general consensus that these three open-country genera are fairly close to *Cossypha*, the dominant genus within the African assemblage of chats. Nevertheless, the resemblance of *Pentholaea* to certain species of *Oenanthe*, notably the close similarity of the



*The **White-eared Solitaire** is a beautifully marked, upright-perching bird with exclusively arboreal habits. It lives in montane forests of the southern Andes and shares the genus* Entomodestes *with a close relative from further north in the same range. These birds, and the sole member of another Neotropical genus,* Cichlopsis*, are named "solitaires", from which it might be concluded that they belong with their namesakes in the subfamily Myadestinae; an inaccurate deduction, as it happens, because biomolecular studies have shown them to be "true" thrushes, members of the subfamily Turdinae, and merely solitaire-like as a result of convergence.*

[*Entomodestes leucotis*, Manu National Park and Biosphere Reserve, Peru. Photo: Heinz Plenge]

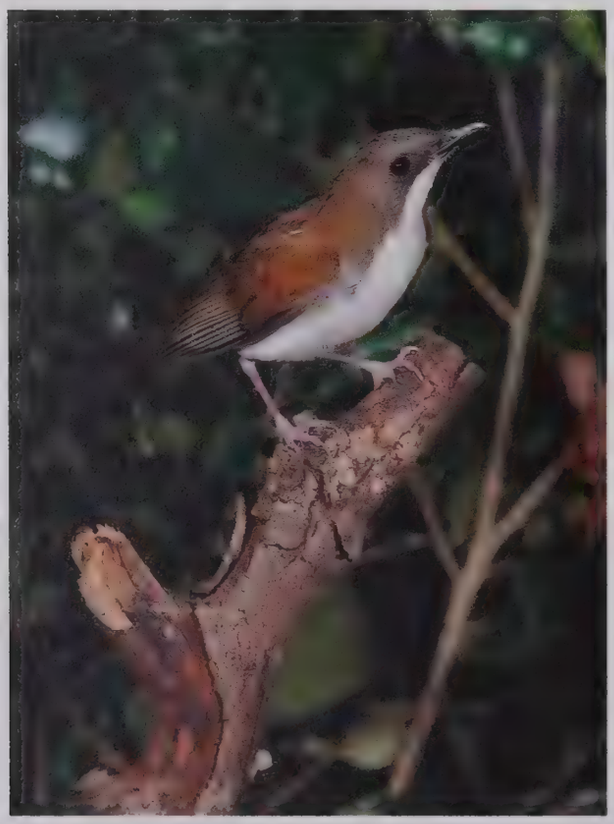


The genus Catharus *contains twelve New World species collectively known as nightingale-thrushes. Their name derives from a supposed resemblance to true Old World nightingales* (Luscinia), *a comparison that applies more accurately to migratory Nearctic members of the genus than to resident Neotropical forms. The* ***Spotted Nightingale-thrush****, a shy terrestrial bird, belongs in the latter category. It is beautifully marked, but difficult to observe as it walks amongst the humid leaf litter of Andean foothill forests.*

[*Catharus dryas ovandensis*, El Triunfo Biosphere Reserve, Chiapas, Mexico. Photo: Patricio Robles Gil/ Sierra Madre]

White-headed Black-chat (*Pentholaea arnotti*) to the Mountain Wheatear (*Oenanthe monticola*), one race of which has an all-black tail, has been considered to indicate a close relationship between these two genera.

Also showing affinities to *Cossypha* is a cluster of species consisting of four monotypic genera, *Pogonocichla*, *Swynnertonia*, *Cossyphicula* and *Stiphrornis*, and a fifth, polytypic genus, the problematic *Sheppardia*. The four monotypic genera are all small, smart, often rather flycatcher-like species, each presenting its own puzzle. *Pogonocichla* is especially intriguing. It is one of two chats in Africa to show, in some subspecies, an unspotted subadult stage between the juvenile and adult plumages; in addition, it has different songs in different parts of its range and, more importantly, two types of piping call which have a patchwork distribution within subspecies, thereby disallowing any easy conclusion with regard to the taxonomic status of the forms. The bill is broad, with marked rictal bristles, evidence of its flycatching behaviour; it has erectile white loral tufts and a distinctive plumage pattern. In contrast, tiny *Swynnertonia*, although often placed adjacent to *Pogonocichla* owing to their similarities in habitat and plumage, has a long thin bill, no rictal bristles and no loral tufts, is sexually dimorphic and feeds on the ground. Curiously, however, it also has a subadult plumage, resembling that of an adult female, and biomolecular analysis indicates that the two genera are, in fact, as close as some past treatments had suggested. Close, too, in genetic terms is *Cossyphicula*. This species is nearest to *Swynnertonia*, despite its resemblance, as its name implies, to a diminutive *Cossypha*, despite the fact that it possesses, as does *Pogonocichla*, a broad-based bill and copious rictal bristles, and despite its song being very similar to that of *Stiphrornis*. The last-mentioned genus is like *Swynnertonia* in having a thin bill, no rictal bristles and an orange-yellow breast, and is like *Pogonocichla* in possessing a white loral spot, albeit an always visible one. In biomolecular analysis, however, it emerges as completely distinct, being closer to *Alethe* and *Cercotrichas* than it is to the great assemblage of "forest robins" focused on *Sheppardia* and *Cossypha*. Nevertheless, pending confirmatory evidence, *Stiphrornis* is retained next to the other monotypic genera with which it appears to have so much in common.



Until recently the genus Alethe *was considered to contain six African species of the humid forest understorey, but recent DNA analysis has shown this grouping to be polyphyletic, requiring the erection of* Pseudalethe *to accommodate four dull-coloured, uncrested, short-legged species, including the* ***White-chested Alethe****. Viewing the data at a higher taxonomic level, the same analysis indicates that all members of the "African forest robin assemblage", including* Alethe *and* Pseudalethe*, share a common ancestor, and thus form a monophyletic grouping which is not reflected in the current sequence.*

[*Pseudalethe fuelleborni*, Chiniziua forest, Mozambique. Photo: Hugh Chittenden]

Species in the genus *Sheppardia*, the radiation of which in Africa has been calibrated as having occurred some 5 million to 3 million years ago, near the Miocene/Pliocene transition, are rather flycatcher-like in appearance and behaviour, having a broad bill and well-developed rictal bristles, but they also feed on the ground and possess relatively long, thin tarsi. They share with *Pogonocichla* an erectile preocular spot, and possess a plain, fairly short tail. Even so, there is some debate about the generic status of certain species, as well as the specific status of others. Bocage's Akalat (*Sheppardia bocagei*) was for long treated in the genus *Cossypha*, largely owing to its dark-centred reddish tail, but it has an erectile preocular spot. Similarly, the Grey-winged Akalat (*Sheppardia polioptera*) has commonly been assigned to *Cossypha*, on the basis of its foraging habits, its skilful flight through the understorey, and its well-developed powers of mimicry, but it, too, has the diagnostic preocular spot, as well as an unpatterned tail, and recent biomolecular work supports its placement within *Sheppardia*. The Gabela Akalat (*Sheppardia gabela*) is a geographical outlier of the genus which lacks the typical orange-rufous coloration, and possesses longer and more pro-

fuse rictal bristles, giving it a very flycatcher-like appearance, from which Clancey judged that it merited recognition in the monotypic subgenus *Gabelatrix*.

DNA work also indicates that three closely related Tanzanian highland species, the Iringa Akalat (*Sheppardia lowei*), the Usambara Akalat (*Sheppardia montana*) and the Rubeho Akalat (*Sheppardia aurantiithorax*), are well separated from other *Sheppardia* and, indeed, from *Cossypha*. Although these comparatively large, dull akalats share the concealed preocular spot, they have relatively sparse rictal bristles and notably long tarsi, and they have previously been placed both in *Alethe* and in a separate genus, *Dryocichloides*. Beresford has demonstrated that *Alethe* is an inappropriate allocation, and pointed out that the type species of *Dryocichloides* was the Olive-flanked Robin-chat (*Cossypha anomala*). This means that, if *anomala* remains in *Cossypha*, a conclusion that her work supports, despite doubts by taxonomists working outside the field of molecular genetics, then the name *Dryocichloides* is unavailable for the three distinctive akalats, and a new genus will be needed in order to signal their lack of affinity with *Sheppardia*.

It is worth mentioning here that these shifting perceptions, of course, have inevitable impacts on the English nomenclature of problematic species. As an example, the Iringa Akalat was formerly known variously as the "Iringa Ground-robin", the "Iringa Alethe" and the "Iringa Robin-chat", and, with the erection of a new genus, yet another new English name for it may be coined. Moreover, and harking back to the first couple of paragraphs dealing with the subfamily Saxicolinae, can a species which has been removed from the genus *Alethe* still be called an alethe? Do we need a name such as "ant-robin" for the "false alethes", those four species now placed in *Pseudalethe*?

Because of its complement of species, a total of 13 in the present arrangement, its geographical spread, and the beauty of its songs and plumages, *Cossypha* is arguably the quintessential African chat genus, the core group against which other African chats and robins are gauged in terms of their degrees of relationship to it. *Cossypha* consists of medium-sized to large, sexually monochromatic chats with long tarsi, the larger species possessing a long graduated tail, and most of them combining dark brown upperparts, orange-rufous underparts and a white supercilium. The key diagnostic character is the rufous tail with dark central feathers. Even so, the group is by no means homogeneous and unproblematic. Archer's Robin-chat (*Cossypha archeri*) and the Mountain Robin-chat (*Cossypha isabellae*) resemble *Sheppardia* in size, dumpy shape, and wing, tail and leg proportions. The former also has a uniformly reddish tail, while the latter's appearance suggests a link to *Cossyphicula* such that Wolters erected for it the genus *Oreocossypha*, which Beresford, incidentally, finds to be tenable. On the other hand, Archer's is very close in appearance, behaviour and voice to the Olive-flanked Robin-chat, and the Mountain Robin-chat appears to form a species pair with Archer's. For the time being, therefore, the two remain in *Cossypha*.

The rocky outcrops of western Angola hold a prize oddity, the dramatic black-and-white Angola Cave-chat (*Xenocopsychus ansorgei*). Distinctive as it is in appearance and ecology, this species bears certain features, including a black head and neck, an elongate white eyebrow and wing-slash, and mostly white underparts, which ally it to one member of *Cossypha*, the White-throated Robin-chat (*Cossypha humeralis*) of neighbouring areas of southern Africa. *Xenocopsychus* has a song like this robin-chat's and makes a similar nest. Its behaviour is very like that of a robin-chat; and its tail pattern, with black central feathers and white, rather than rufous, outer feathers, is particularly telling. Thus, despite its scientific generic name, it is not a geographically misplaced *Copsychus*, a magpie-robin in a foreign land; in reality, it is a highly modified *Cossypha*.

Placed, as is the previous species, in a monotypic genus, but having an Asian breeding distribution, the White-throated Robin (*Irania gutturalis*) bears a striking resemblance to certain species of *Cossypha*, although its all-black tail and its strong migratory behaviour suggest that a close link is unlikely. *Irania* is, however, an intriguing form which may have links to *Phoenicurus* or even *Cercotrichas*, but is probably closest to the robins and nightingales of the genus *Luscinia*. Many of the latter are characterized by having neat, bright underparts, including a distinctive throat coloration and pattern; the Indian Blue Robin (*Luscinia brunnea*) and *Irania* are notably alike in plumage.

The genus *Luscinia* itself is one in which many of the salient qualities of the saxicolines find their most extreme expression. These species are among the most skulking and the most nondescript, but also the most exuberantly coloured and the most exquisitely voiced, of all chats. They are all the size of a sparrow (*Passer*), with a slender bill, reduced rictal bristles, fairly long



The genus Cichladusa *contains an aberrant African trio with uncertain affinities. They have been considered close to some "African forest robins", but unlike any of these they construct mud nests. This is suggestive of a separate evolutionary history, as is the association with palms shown by two of the three species. The* ***Rufous-tailed Palm-thrush****, for example, is commonly found in ivory palm* (Hyphaene) *savanna, as well as oil-palm* (Elaeis) *groves, and it regularly roosts in palm trees. For these reasons, the genus is distanced from the main core sequence of saxicolines until its relationships are clarified by further research.*

[*Cichladusa ruficauda*, Epupa Falls, Kunene River, Namibia. Photo: Geoff McIlleron]



Phylogenies constructed on the basis of biomolecular analysis regularly throw up contradictory results. The Brachypteryx *shortwings, for instance, are traditionally treated as primitive chats, a view rejected by early DNA studies, but supported by more recent work. The shortwings form a discrete Asiatic assemblage of furtive terrestrial species, anomalous as much for their habit of running (not hopping), as for their semi-concealed white loral spots. The predominance of blue in the plumage of males, as shown by this* ***White-browed Shortwing****, prompts their placement alongside* Grandala *and* Myophonus.

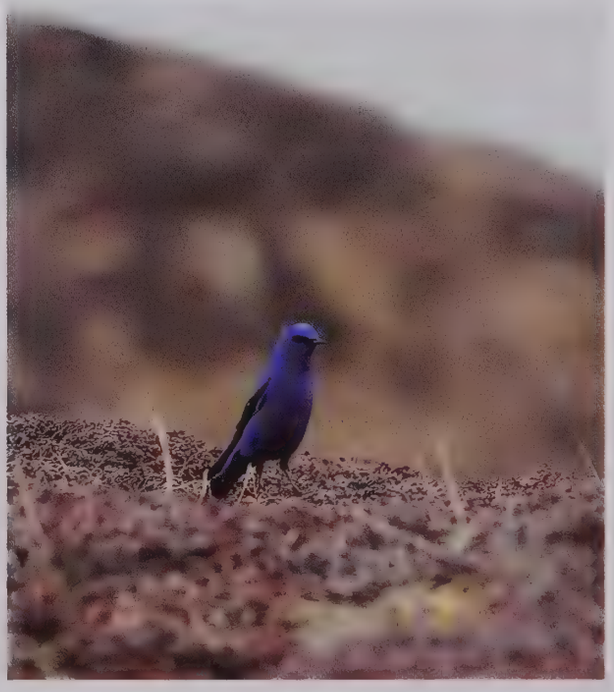
[*Brachypteryx montana cruralis*, Doi Inthanon National Park, Thailand. Photo: Bernard Van Elegem]

wings, a medium-length tail and relatively long legs, most or all being adapted to mainly terrestrial foraging on damp ground under heavy vegetation cover. Except in the case of the two nightingales and the Rufous-tailed Robin (*Luscinia sibilans*), the sexes are markedly different, the males having strikingly contrasting underpart patterns, whereas the females are largely brown and cryptic. The "female-plumaged" Thrush Nightingale (*Luscinia luscinia*) and Common Nightingale (*Luscinia megarhynchos*) compensate for their unremarkable appearance by their songs (see Voice, Relationship with Man), but all 13 species, with the single exception of the male Bluethroat (*Luscinia svecica*) when singing, remain exceptionally secretive and difficult to see. Several species have a colourfully patterned tail involving bright lower halves of the outer feathers, a character which points towards *Phoenicurus*, *Oenanthe* and associated genera.

During the last half-century, species in the genera *Luscinia*, *Tarsiger*, *Sheppardia* and *Swynnertonia* were sometimes lumped in *Erithacus*, along with the type species of the latter, the European Robin, and various permutations of this treatment have continued since then, with one or more genera removed. Today, it is generally admitted that the European Robin is in many ways unique and is deserving of monotypic generic status. At the end of the *Luscinia* sequence, however, are two puzzling far eastern insular species, the Japanese Robin (*Luscinia akahige*) and the Ryukyu Robin (*Luscinia komadori*); the colour pattern, notably in the female Japanese Robin, and the demeanour of these two seem most closely to resemble those of the European Robin, and they are therefore frequently treated in *Erithacus*. Nevertheless, on both biogeographical and behavioural grounds, these species seem far more likely to belong with the Chinese radiation that produced the Firethroat (*Luscinia pectardens*), the Rufous-headed Robin (*Luscinia ruficeps*) and the Black-throated Blue Robin (*Luscinia obscura*); further, their blue or pinkish eggs are more typical of *Luscinia* than of *Erithacus*, which has white-based eggs.

Erithacus has softer, more copious plumage than that of *Luscinia*, as well as a less powerful song and structure, less migratory habit and less inhibited, more frenetic demeanour. Its former extension to include *Sheppardia* is best quietly forgotten, as the two genera have little in common beyond a superficially similar plumage coloration. Placement of *Erithacus* between *Luscinia* and *Tarsiger* does, however, reflect the stepped, if only slight, decreases in robustness and terrestrial behaviour shown by the three genera. *Tarsiger*, the bush-robins, are rather delicate, mainly arboreal chats with a fine bill, like that of an Old World warbler (Sylviidae), and striking male plumage patterns. They presumably arose in the Himalayas, where all except one of the five species are still to be found.

The scrub-robin genus *Erythropygia* is decidedly anomalous. Frontally scutellated tarsi, absence of sexual dichromatism, absence of a spotted juvenile plumage, and perhaps also a resemblance in tail posture and pattern to some prinias (*Prinia*), led to its being placed for many years with the Old World warblers, but the strong legs and terrestrial behaviour are robin-like. The long, graduated, white-tipped, steeply cocked tail is a characteristic feature of the scrub-robins. Like the palm-thrushes in *Cichladusa*, which Meinertzhagen thought congeneric, they are mainly brown-and-rufous birds of relatively open, dryland areas, although some species are highly reclusive and generally detectable only by their fine songs. Most species have bold facial patterns and wing mark-



The ***Grandala*** *is so peculiar that it was once classified as the sole occupant of a monotypic family, Grandalidae. Its most unusual features are its extreme primary projection and its gregariousness, but these are now thought to be adaptations to the extreme Himalayan environment, the former a tool for sustained nomadic flight and the latter a response to scarce and patchy resources. Genetic studies place it within the turdine cluster, but it shows enough chat-like features, such as female plumage pattern and habitual wing-flicking, that it is tentatively retained as an anomalous chat without clear origins.*

[*Grandala coelicolor*, Paro Valley, Bhutan. Photo: Roland Seitre]



The whistling-thrushes are large, dense-plumaged, tough-skinned birds. Their bills are stout and hook-tipped, and their plumage is often blue with patches of iridescence. Despite being similar in size to Turdus, *they are probably an early offshoot of the chats. Each of the Greater Sunda islands of Sumatra, Borneo and Java is home to at least one resident form of* Myophonus. *One montane representative in each case was treated as a race of the "Sunda Whistling-thrush", which on the balance of evidence is now thought better split into three separate island species. That on Java thus becomes the* ***Javan Whistling-thrush****, largest and bluest of the trio.*

[*Myophonus glaucinus*, Gunung Gede, Java. Photo: Bernard Van Elegem]

ings. The Black Scrub-robin (*Cercotrichas podobe*) is usually considered congeneric with the other scrub-robins, all then being placed in *Cercotrichas*. It shares with them white spots on the tail tips, but is exceptional for its larger size and almost all-black plumage, and for various reasons seems best isolated in its own separate genus. Further generic splitting of the scrub-robins may be in order: T. B. Oatley has already taken the step of assigning the Brown Scrub-robin (*Erythropygia signata*) and its three supposedly closest relatives in the discarded genus *Tychaedon*, albeit without offering a clear diagnosis, and other changes may be proposed in due course. Song and reclusiveness are both highly developed in these last four species, and their tail movements are less pronounced.

Although there is unlikely to be a strong link between these primarily Afrotropical scrub-robin genera and the predominantly Asian genus *Copsychus*, the association of good song quality with obtrusiveness is also demonstrated well by the White-rumped Shama (*Copsychus malabaricus*). In addition, the Black Scrub-robin finds in the Oriental Magpie-robin (*Copsychus saularis*) an ecologically, behaviourally and visually rather similar counterpart. *Copsychus* are medium-sized, robust, long-tailed, mainly black-and-white chats, some with semi-terrestrial habits. The two species mentioned are the sole representatives of the genus in mainland Asia, the arboreal shama in the south-east and the semi-terrestrial, and very familiar, magpie-robin throughout. Like several other Asian bird genera, however, *Copsychus* has successfully spread through the western Indian Ocean to the Seychelles and Madagascar, and there is a small radiation in the Philippines. A close relative, the monotypic *Trichixos* of the Sundaic forests, resembles the White-rumped Shama but is stouter-billed, with a concealable white supraocular line and a dark-tipped orange-rufous tail.

The genus *Saxicoloides* holds a single species, the Indian Robin (*Saxicoloides fulicatus*), which is superficially sufficiently akin to *Copsychus* in appearance and behaviour to have been mistakenly treated in that genus in the past. The degree of their relatedness is unknown but, most unusually among the chats, the well-developed tarsi of *Saxicoloides* are scutellated, and it has therefore been supposed that the genus represents some form of link to the accentors (Prunellidae), the scutellate tarsi of which have repeatedly been viewed as a key factor disqualifying them from membership of the chats. The bill of *Saxicoloides* is also unusual, being slightly downcurved, the wings are notably pointed, and the tail is long and is rather languorously dipped as the bird hops about on the ground. This species has a merely vestigial song, it nests in holes, and its juveniles possess vague bars and streaks. The true affinities of the Indian Robin are very unclear; the great chronicler of Sri Lankan ornithology, V. Legge, thought them almost timaliine.

The two water-redstart genera, *Chaimarrornis* and *Rhyacornis*, present a simpler problem, albeit one not entirely resolved. There have been various treatments and recommendations, including one that suggests that *Chaimarrornis* belongs in the African cliff-chat genus *Thamnolaea* and, more prosaically but probably more accurately, one that merges both genera in *Phoenicurus*. The water-redstarts are clearly very close to "true" redstarts and have tail coloration and movements which are similar to those of certain *Phoenicurus*. The plumage patterns in both water-redstart genera are, however, highly distinctive, as also, of course, are their ecologies. Whether they are more closely related to each other than to other redstarts, as some authorities have suggested, is unresolved. In the present treatment they are placed one on each side of the major genus *Phoenicurus*, which contains eleven species. This genus is characterized by the rather slender bill, distinct rictal bristles and soft plumage, with the rump and outer tail chestnut in almost all species, and by the distinctive tail actions exhibited by most of its members. *Phoenicurus* is also distinguished by having two species, the Common Redstart (*Phoenicurus phoenicurus*) and the Black Redstart (*Phoenicurus ochruros*), which not infrequently hybridize and produce fertile offspring, and which are maintained as separate species chiefly by their ecological preferences and the greater adaptation of the latter for a terrestrial life.

The monotypic *Hodgsonius* was once considered a shortwing, presumably owing to its largely terrestrial and reclusive habits, but Ripley considered it to provide a likely link between *Phoenicurus* and *Myiomela*, bearing, as it does, characters of both genera. The orange-red sides of the dark, rather long tail recall *Phoenicurus*, while the slaty-blue coloration and skulking habits suggest *Myiomela*. The most widely distributed species of *Myiomela*, the White-tailed Blue Robin (*Myiomela leucura*), substitutes white basal sides of the tail, and, like the two preceding genera, shows a similar pattern of sexual dimorphism. The present composition of the genus *Myiomela* is, however, novel. As noted earlier, and representing another instance of what might be considered shortwing convergence, the bird that is usually called the

"White-bellied Shortwing" and placed in the genus *Brachypteryx* is now believed to consist, in fact, of two *Myiomela* species, the Nilgiri Blue Robin and the White-bellied Blue Robin. Further analysis of the generic placement of these two "new" species is needed, as also is an examination of the differences between *Myiomela* and *Cinclidium*. These two genera have often been united owing to their general conformity of colour, shape and size, and it is notable also that they share with *Myophonus* the shining grey-blue forehead and "shoulder", but the monotypic *Cinclidium* has a long, graduated tail, pale-scaled underparts, and white primary coverts on the underwing. All species in *Hodgsonius*, *Myiomela* and *Cinclidium* are remarkably poorly studied.

In complete contrast, the genus *Saxicola* is among the best known of all the chats, owing in particular to the astonishing success of the Common Stonechat (*Saxicola torquatus*), the only member of the family to breed throughout Africa, Europe and Asia. In terms of plumage, *Saxicola* is a rather disparate assemblage, its eleven species united chiefly by their foraging behaviour. All are compact and upright; all but one, Hodgson's Bushchat (*Saxicola insignis*), are small, with a short, broad-based bill, and, with the sole exception of Jerdon's Bushchat (*Saxicola jerdoni*), all have a short square tail. They feed by flights to the ground or into the air from low to medium-height lookout perches, but, again, there is a single exception, the White-bellied Bushchat (*Saxicola gutturalis*). This last species, from Timor, is sufficiently anomalous to pose the question of whether it belongs in *Saxicola* at all; Timor is an Endemic Bird Area with some great avian curiosities, many deserving renewed taxonomic study. On the other hand, *Saxicola* is the only chat genus other than the *Brachypteryx* and *Heinrichia* shortwings that penetrates east of Wallace's Line and, furthermore, it is the only one, in the form of the Pied Bushchat (*Saxicola caprata*), that breaks across Weber's Line, the median point in the transition zone between the Oriental and Australasian Regions. This latter phenomenon seems, however, to be a very recent development, as the Pied Bushchat has no recorded brood parasites in New Guinea, despite the abundance there of the Brush Cuckoo (*Cacomantis variolosus*), a known parasite of *Saxicola*; moreover, its clutch size in New Guinea, where it lays almost as many eggs as it does in its Palearctic range, is remarkably large for a tropical cup-nester.

It is possible that some Oriental bushchats not obviously derived from the Common Stonechat are more closely allied to *Cercomela* chats than to other *Saxicola*, although *Cercomela* exhibits little or no sexual dichromatism. These are the Pied Bushchat, Jerdon's Bushchat, the Grey Bushchat (*Saxicola ferreus*) and perhaps even the White-bellied Bushchat. Although the males of these species are rather distinctive and certainly different from any *Cercomela*, the females, with a black tail and rufous-buff rump, some with rufous-buff continuing onto the basal outer tail, are very reminiscent of such *Cercomela* as, for example, the Familiar Chat (*Cercomela familiaris*).

Southern Africa's Buff-streaked Chat (*Campicoloides bifasciatus*) is commonly treated as an aberrant *Saxicola*, having much the same pattern, colour and sexual dimorphism as the Common Stonechat, or as an aberrant *Oenanthe*, vaguely resembling the Black-eared Wheatear (*Oenanthe hispanica*) or the Somali Wheatear (*Oenanthe phillipsi*), while its black tail recalls some *Cercomela* chats. A. Tye strongly favoured *Saxicola* as its closest relative and proposed its placement there, but this judgement minimized the significance of the species' unusual egg colour, creamy or buff with heavy reddish-brown freckles. This and its more terrestrial behaviour combine to suggest that treatment of the Buff-streaked Chat in its own monotypic genus remains appropriate, possibly reflecting an ancient lineage within the African chat assemblage, but perhaps indicating a bridge between *Saxicola* and *Oenanthe*.

Similarly, *Cercomela* chats are regarded as a link between *Saxicola* and *Oenanthe*, being more terrestrial than the former and somewhat less so than the latter; one species also suggests a link back to *Phoenicurus*. These chats are small and dull-plumaged, albeit with a rather more distinctive tail. Three of the species have a black tail, hence the name "*Cercomela*". Two have a rufous rump and rufous tail sides with an otherwise black tail, and four have a black tail with white outer feathers in various patterns. Three species from south-western Africa, differing in rump and tail patterns, have the distal part of the inner vane of the outermost primary P9 emarginated, giving rise to the epithet "sickle-winged" and the generic name *Emarginata*, last used by Ripley for the two species in which the feature is most pronounced. One chat commonly treated in *Cercomela* is now returned to its own monotypic genus, *Pinarochroa*, on the basis of its somewhat longer legs and considerably shorter, wheatear-like tail. This is the Moorland Chat (*Pinarochroa sordida*), often referred to as the Sombre Chat.

Oenanthe itself is the largest genus in the chat subfamily, with 21 species recognized in the present, relatively conservative arrangement. Wheatears form a rather homogeneous group of stocky, medium-sized terrestrial chats of open, mainly arid



Thrush-like in shape and hence in name, the members of the genus Monticola *are now generally viewed as saxicoline chats, rather than part of the main thrush lineage. The plumage of most species largely consists of ashy blues, dull chestnut-orange and white. The* ***White-throated Rock-thrush*** *is no exception. It is also fairly typical of Palearctic forms in its migratory nature, breeding in the forests of north-east Asia from Lake Baikal to the Russian Far East, North Korea, and north-east China, then migrating to South-east Asia for the winter. Some individuals, like this one, turn up from time to time as vagrants in Japan.*

[*Monticola gularis*, Isekawa, Japan. Photo: Hirozo Maki]



Monticola *is speciose in both Asia and Africa, which presents complications when trying to determine its origins. One theory holds that an ancestral rock-thrush first appeared in Asia and diversified, followed by repeated invasions of Africa during glaciation cycles, each influx leaving behind a newly speciating population. In this way, the* ***Cape Rock-thrush*** *of southern Africa is supposedly the result of an early invasion by the Blue Rock-thrush* (M. solitarius). *This view has not attracted much support, and certainly is not reflected in the traditional sequence. However it arose, the Cape Rock-thrush exemplifies the African members of the genus, and indeed open-country* Monticola *in general, in being a rotund bird, colourful in a washed-out kind of way, as if bleached by too much sun. Likewise, it is fond of mountainous terrain, and prone to perching prominently on vantage points, such as buildings, boulders and the tops of crags. In some regions it frequents burnt karoo or grassland, and visits seashores down to the intertidal zone.*

[*Monticola rupestris*, northern KwaZulu-Natal near Wakkerstroom (Mpumalanga), South Africa. Photo: Andy & Gill Swash]



The Malagasy rock-thrush radiation was once placed in a separate genus, Pseudocossyphus. *However, despite their small size, and forest-dwelling or scrub-dwelling habits, its members match certain continental* Monticola *species closely in colour pattern, not to mention foraging behaviour, suggesting that the two genera are best merged. The* ***Amber Mountain Rock-thrush****, pictured here, is often treated as a subspecies of the Forest Rock-thrush* (M. sharpei)*, and this may yet prove to be the most appropriate arrangement.*

[*Monticola erythronota*, Montagne d'Ambre National Park, Madagascar. Photo: Roland Seitre]

environments. They have a slender black bill and stout black legs, reduced rictal bristles and a short tail, and almost all are characterized by the possession of neatly delineated, brilliant white on the rump and basal tail sides, "white arse" being the origin of the modern English appellation, although sometimes the white is replaced by buff or rufous. Otherwise, the plumage is commonly sandy, with black ear-coverts or face and wings, or else black and white throughout. Some wheatear species are dimorphic or polymorphic, and the interplay between polymorphism and speciation in this genus is of considerable interest with regard to evolutionary theory. In particular, work led by E. N. Panov has sought to explain the extraordinary circumstance in the Variable Wheatear (*Oenanthe picata*), where it has for years been unclear whether the semi-assortative groupings of its variably appearing populations involve morphs, subspecies or even species. The considerable number of "morphs" exhibited by wheatears appears to be related to the surprising degree of speciation within the genus, which is, in turn, related to the delicate and not necessarily inflexible ecological divisions that have served to divide them. There is much hostile interaction among these species where they overlap geographically. A degree of miscegenation may be inevitable if the barriers between species are basically far more behavioural than they are ecological.

Enicurus, the forktails, seem to remain entirely outside the preceding group of chats. Several characters distinguish them, most notably the deeply bifurcate tail and the remarkable pied plumage. All have pale-coloured legs, greatly reduced songs and streamside-haunting habits. They have not always been regarded as close to the thrushes and chats, and in the past they have been placed in a separate family or subfamily; because the form of their wings is "essentially Timeliine [*sic*]", R. B. Sharpe, in volume four of the *Catalogue of Birds in the British Museum*, published in 1883, classified them as aberrant babblers. In the absence of evidence of a close relationship to any other chats, the seven forktails are deemed to represent a separate tribe.

The problem of species limits in the Turdidae is considerable. Even a cursory review of the species as admitted in the present account suggests that well over 10% have unresolved questions relating to their taxonomic status; merely on the basis of the lists below, which are by no means complete, the family could number as few as 313 species or as many as 381, a startlingly wide margin. These questions fall into two categories. First, there is the issue of whether accepted species merit their taxonomic ranking or should be relegated to the status of subspecies. This is much the less common type of problem, but it still affects many taxa. Second, there is the increasingly frequent tendency to elevate well-differentiated subspecies to species status, decisions based sometimes on traditional arguments relating to biological incompatibility, sometimes on newly determined genetic distances, sometimes on principles derived from a species concept other than the biological, and sometimes on mistaken assumptions over the relevance of large geographical disjunctions.

In the first category, from the standpoint of the arrangement currently adopted, there are a good many species over which real uncertainties or differences of judgement appear to persist, or where arguments in favour of splitting have not been formally set out. In the subfamily Myadestinae, these involve Rufous (*Stizorhina fraseri*) and Finsch's Flycatcher-thrushes (*Stizorhina finschi*), and Black-faced, Varied (*Myadestes coloratus*) and Andean Solitaires (*Myadestes ralloides*). In Turdinae, the same problems relate to the following pairs or groups: Naumann's (*Turdus naumanni*) and Dusky Thrushes (*Turdus eunomus*); Rufous-throated (*Turdus ruficollis*) and Black-throated Thrushes (*Turdus atrogularis*); Common, Tibetan (*Turdus maximus*) and Indian Blackbirds (*Turdus simillimus*); Olive, Taita (*Turdus helleri*) and Somali Thrushes (*Turdus ludoviciae*); Pale-vented (*Turdus obsoletus*), Cocoa (*Turdus fumigatus*) and Hauxwell's Thrushes (*Turdus hauxwelli*); Spectacled (*Turdus nudigenis*) and Ecuadorian Thrushes (*Turdus maculirostris*); Grey-cheeked (*Catharus minimus*) and Bicknell's Thrushes (*Catharus bicknelli*); and in the western Pacific, New Britain (*Zoothera talaseae*), San Cristobal (*Zoothera margaretae*) and Guadalcanal Thrushes (*Zoothera turipavae*). Not surprisingly, the Saxicolinae are afflicted with similar uncertainties over species limits, as illustrated by the following examples: White-tailed (*Alethe diademata*) and Fire-crested Alethes (*Alethe castanea*); Forest (*Monticola sharpei*) and Benson's Rock-thrushes (*Monticola bensoni*); Lowland (*Sheppardia cyornithopsis*) and Equatorial Akalats (*Sheppardia aequatorialis*); Siberian (*Luscinia calliope*) and White-tailed Rubythroats (*Luscinia pectoralis*); Miombo (*Erythropygia barbata*) and Bearded Scrub-robins (*Erythropygia quadrivirgata*); Przevalski's (*Phoenicurus alaschanicus*) and Eversmann's Redstarts (*Phoenicurus erythronotus*); Common and White-tailed Stonechats (*Saxicola leucurus*); Pied (*Oenanthe pleschanka*) and Black-eared Wheatears; Chestnut-rumped (*Oenanthe xanthoprymna*) and Rusty-tailed Wheatears (*Oenanthe chrysopygia*);

and Buff-breasted (*Oenanthe bottae*) and Heuglin's Wheatears (*Oenanthe heuglini*). This yields a total of 44 currently accepted species that might be collapsed into 20.

In the second category, candidates for separation as distinct species are as follows: race *niveiceps* of the Island Thrush, race *smithi* of the Olive Thrush, the nominate race of the Comoro Thrush (*Turdus bewsheri*), race *xanthorhynchus* of the Gulf of Guinea Thrush, race *anthracinus* of the Chiguanco Thrush (*Turdus chiguanco*), race *caucae* of the Black-hooded Thrush (*Turdus olivater*), race *confinis* of the American Robin, races *daguae* and *assimilis* of the White-throated Thrush (*Turdus albicollis*), race *graysoni* of the Rufous-backed Thrush (*Turdus rufopalliatus*), race *subalaris* of the Slaty Thrush (*Turdus nigriceps*), races *ardosiaceus* and *albiventris* of the Red-legged Thrush (*Turdus plumbeus*), race *tanganjicae* of the Abyssinian Ground-thrush (*Zoothera piaggiae*), races *aurea*, *major*, *horsfieldi* and *neilgherriensis* of the Common Scaly Thrush, race *cuneata* of the Bassian Thrush (*Zoothera lunulata*), race *atrigena* of the New Britain Thrush, race *griseiceps* and grey-headed allies of the Orange-billed Nightingale-thrush (*Catharus aurantiirostris*), at least races *goodfellowi* and *floris* of the White-browed Shortwing (*Brachypteryx montana*), races *picta* and *simplex* of the Great Shortwing, race *harterti* of the White-headed Black-chat, race *bensoni* of the East Coast Akalat (*Sheppardia gunningi*), the "northern *poensis* group" of Bocage's Akalat, races *macclounii*, *grotei* and *mbuluensis* of the Olive-flanked Robin-chat, race *tschebaiewi* of the White-tailed Rubythroat, race *superbus* of the European Robin, race *rufilatus* of the Orange-flanked Bush-robin (*Tarsiger cyanurus*), race *formosanus* of the White-browed Bush-robin (*Tarsiger indicus*), race *tongensis* of the Brown Scrub-robin, race *albiventris* of the White-rumped Shama, race *superciliaris* of the White-browed Shama (*Copsychus luzoniensis*), races *spectatrix* and *validior* of the Brown-tailed Chat (*Cercomela scotocerca*), race *seebohmi* of the Northern Wheatear (*Oenanthe oenanthe*) and, finally, subspecies groups *lugentoides*, *lugubris* and *schalowi* of the Mourning Wheatear (*Oenanthe lugens*). This extensive list yields a total of 32 species that might be split into 76 species.

It should be made clear that the species limits adopted in the present arrangement are regarded as appropriate. Relatively few of the possible "lumpings" and "splittings" listed in the preceding paragraphs are, on present evidence, compelling propositions; if they were, they would have been implemented. Even so, judgements may not always appear to be founded on constancy of criteria. For example, the two pairs of Palearctic thrushes *Turdus naumanni–eunomus* and *Turdus ruficollis–atrogularis* are maintained as four species because each is so distinct from its "sibling", despite the two broad areas of intergradation; yet the highly distinctive red-breasted race *philippensis* of the Blue Rock-thrush, which also has a broad area of intergradation with other populations, is retained as a subspecies. The reasons for such seeming contradictions are often too elaborate to detail, yet simply to follow established precedent, if inappropriate, is often a rather unpalatable alternative.

The number of "splittable" species is potentially much larger than is listed above, owing to an increasing preference among some biologists for the delineation of species on the basis of constant clear-cut diagnostic characters, however minor, thereby tending to render subspecies obsolete. On this basis, the Island Thrush alone, given the geographical isolation of each of its races, putatively represents 51 different species. To most authorities such a rearrangement appears implausible, but the Island Thrush is crying out for a detailed evaluation of its characters and distribution in order to enable taxonomists to gauge, at least, whether a single species is involved.

Several other chronic species-level problems exist in the taxonomy of the thrushes and chats which field, museum and laboratory biologists are still far from resolving satisfactorily. The issue of whether the Common Stonechat is one or three species has recently arisen, following biomolecular evidence that the European, Asian and African populations have each been separated for something like a million years. While the three-way split has been adopted with alacrity in some quarters, it is notable that variation *within* each new "species" can be greater than that measured *between* them, rendering diagnosis without DNA analysis highly problematic. In other words, if the Common Stonechat is deemed to represent three species, it is difficult to see why it should not be six, or eight, or more; its retention as one species seems the better option, at least until the variation within the new postulated "species" is properly explored and understood. A problem that has to be faced with this course of action, however, is that, on current genetic evidence, the Fuerteventura Stonechat (*Saxicola dacotiae*) is closer to the European populations of



The genus Thamnolaea *contains two exclusively Afrotropical species of crags and kopjes, inselbergs and gorges, and whatever partially vegetated rocky ground they can find. Their favoured habitats, and their general colour pattern, suggest a relationship with* Monticola, *although this may result from convergence rather than any true affinity. The* ***Mocking Cliff-chat*** *is the more familiar of the duo, occurring extensively through East Africa, and often becoming tame at car-parks and camp-sites. The bird pictured here is accustomed to tourists visiting a famous vantage point over Lake Nakuru.*

[*Thamnolaea cinnamomeiventris subrufipennis*, Lake Nakuru, Kenya. Photo: Stephen Dalton/ NHPA]



The African genus Myrmecocichla, *sometimes collectively known as the anteater-chats, is sometimes broadened to include the* Thamnolaea *cliff-chats too. The catalogue of dissimilarities between them is extensive, however, supporting their separation. The members of* Myrmecocichla *are mostly blackish in plumage, as illustrated by this* **Sooty Chat**, *and they tend to have a much more obviously upright stance, and a shorter tail, sometimes held cocked. Unlike cliff-chats they sing weakly, and prefer level landscapes with scattered shrubs, stumps and termitaria, especially favouring short-sward grassland, across which they travel with an odd buzzing flight, revealing conspicuous white wing-flashes as they go. Moreover, they usually excavate their own nests, while cliff-chats often appropriate the mud-nests of swallows (Hirundinidae).*

[*Myrmecocichla nigra*, Masai Mara National Park, Kenya. Photo: Luiz Claudio Marigo]

the Common Stonechat, and the Reunion Stonechat (*Saxicola tectes*) is closer to the African populations of the latter, than these two populations of the Common Stonechat are to each other. This makes it relatively difficult to continue to regard the island taxa as full species, although there are other ways of looking at the situation.

Other cases in which there is pressure to break down one "large" species into several "smaller" ones are the Common Scaly Thrush and the White-browed Shortwing of eastern Asia. Both the thrush and, at least among its males, the shortwing are rather homogeneous in plumage over their wide ranges, but subtle morphological variations are often backed up by other characters such as song and egg colour. On Mindanao in the Philippines, there are several mountains on which White-browed Shortwings radically alter their songs at a certain elevation, yet ornithologists have so far failed to find any morphological character distinguishing populations at different altitudes. Shortwings are to some degree comparable to the *Scytalopus* tapaculos (Rhinocryptidae) of South America in terms of their reduced wing size and mouse-like habits, factors which imply minimal genetic interchange between isolated populations; it is not impossible that, as with *Scytalopus*, vocalizations and biomolecular studies may reveal that some *Brachypteryx* taxa currently ranked as subspecies will prove to be distinctive enough to merit species status. In Africa there is intractable confusion over the dividing line between the African (*Turdus pelios*) and the Olive Thrushes, and the assignment of some subspecies to one or the other of these two species is still highly unstable. In South America, the Great Thrush (*Turdus fuscater*) and the Chiguanco Thrush approach each other closely in size and appearance, differing where they meet in that the former possesses an eyering; but the Chiguanco Thrush's acquisition of an eyering, in addition to darker coloration, south of the range of the Great Thrush raises the question of whether the subspecies involved, *anthracinus*, belongs in reality with the latter species.

The difficulty with all these cases is in ensuring a sufficiency of material for the evaluator. Such material needs to be of several types: specimens, including eggs and nests, in museum trays and tissue samples in laboratory refrigerators are the most obvious, but recordings in institutional sound archives, photographs on websites, and published field notes, preferably quantified, on behaviour and ecology are also of great use. With species having very large geographical ranges, it is often difficult to obtain or to find adequate samples, and sometimes any at all, from crucial areas where two taxa are thought to be in contact, and in the modern era the situation is compounded by national laws, international treaties and, not infrequently, security problems that render such sampling ever more expensive and logistically challenging. All this indicates the need for ever-increasing levels of co-operation and collaboration among workers in various disciplines, and including the more adventurous birdwatchers, in order to begin to resolve the many outstanding issues in turdid systematics.

Morphological Aspects

The success of the thrushes and chats in terms of global distribution and habitat occupancy is directly related to their use of the ground and lower vegetation strata and to an associated ecological flexibility that enables them to exploit both invertebrates and fruit. These factors are reflected in the morphology of the family. The species in both main subfamilies are remarkable mainly for their generalized condition, adapted as they are for both terrestrial and arboreal life, for both invertebrate and vegetarian diets; nor are there any elaborate plumage structures or extremes of differentiation between the sexes, suggesting that the standard avian social mating system of "monogamy" and pairwise territoriality applies throughout. Only a single species is highly modified, this being the Grandala, which has swallow-shaped wings (see Systematics), while two, the sicklewing chats of the genus *Cercomela*, have curious structural deviations of one primary. What variations exist in body size, and in the lengths and shapes of the bill, wing, tail and tarsus, reflect the flexible yet strongly consolidated behavioural and ecological adaptations for feeding and breeding to be found throughout the family. As an example, chats inhabiting patches of shrubby thickets and foraging mainly on foot have short rounded wings with high wing-loading, and strong legs and feet, whereas species foraging mainly by aerial hawking or perch-and-pounce techniques in more open areas have longer wings, shorter tarsi and longer rictal bristles.

The myadestine thrushes range in size from 16 cm to 27 cm, and in weight from 24 g to 72 g. These are mainly medium-sized species with relatively short tarsi, a relatively short, broad-based bill with mostly short sparse rictal bristles, and relatively long wings and tail, and they typically adopt more upright postures than those of the true thrushes or chats. They feed mainly by aerial sallying, perch-to-ground flights, or hover-gleaning movements in foliage, taking insects by the first and second techniques and fruit by the third. The long wings and tail provide the necessary manoeuvrability and power; the bill gives the capacity to seize and pluck; and the short legs are responsible for the upright stance and the ability to launch into flight strongly in any direction. In all these aspects a convergence on flycatchers is appar-



The African akalat radiation contains ten species of the humid forest understorey. They are dainty and flycatcher-like in appearance, with broad-based bills and well-developed rictal bristles, but their tarsi are relatively long. Evolutionarily, they seem close to robin-chats (Cossypha)*, differing mainly in shape, as well as in their erectile pre-ocular spots, and shorter, plainer tails. Predicatably, the generic allocation of some forms is debated.* ***Bocage's Akalat****, for instance, is sometimes included in* Cossypha *owing to its dark-centred reddish tail, but its posture and pre-ocular spot argue for inclusion in* Sheppardia.

[*Sheppardia bocagei*, Mutinondo, north-east Zambia. Photo: Johann Grobbelaar]

ent. An interesting phenomenon is recorded for Townsend's Solitaire. This species, when bringing food to its young, carries the items in the upper part of the digestive tract or in a sublingual pouch, the anatomical details of which have not yet been determined. It had been noticed that this species is a relatively infrequent provisioner of food at nests, and this storage mechanism explains why, since it evidently permits a relatively large number of prey items to be delivered in one visit. It is possible that this adaptation, found so far in just this one species, has evolved as a means of avoiding nest predation; nests of *Myadestes* are commonly placed on the ground, where the risks may be correspondingly higher.

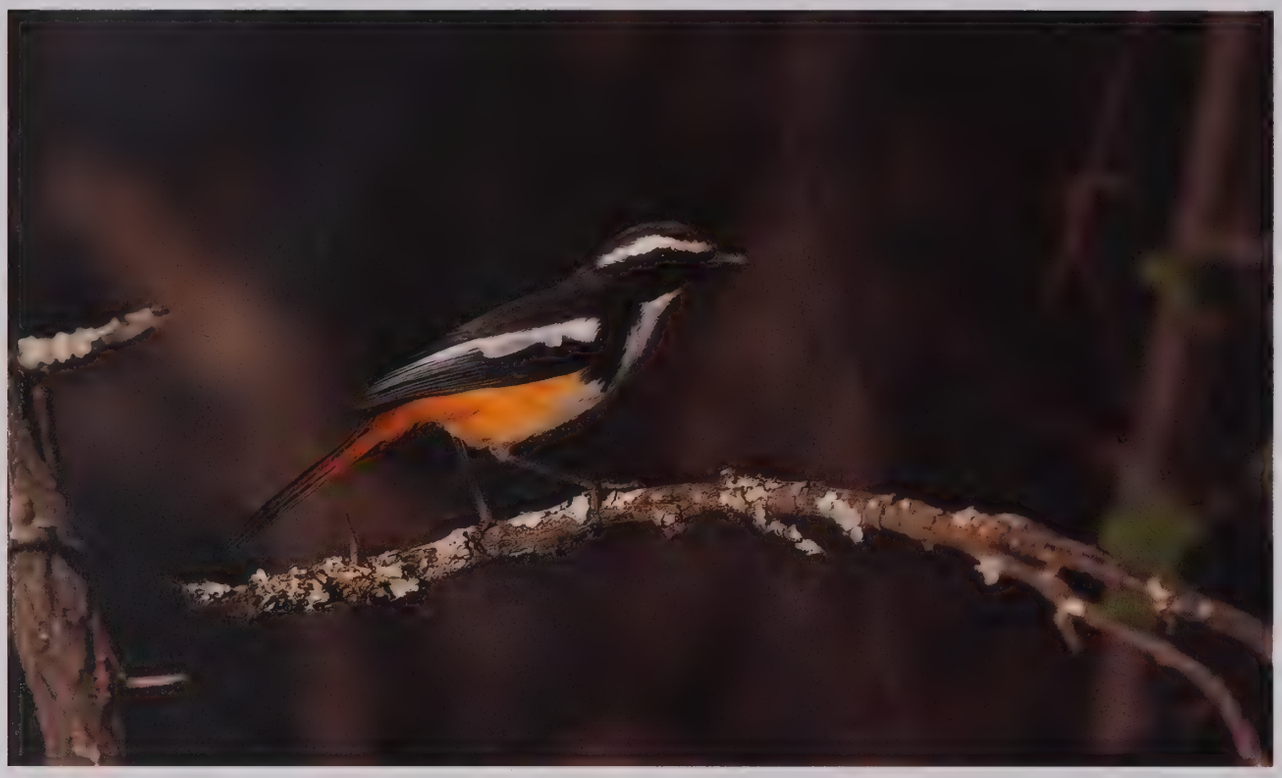
Turdine thrushes range in size from 14·5 cm to 33 cm and in weight from 21 g to 175 g. The great majority fall in the respective ranges 20–25 cm and 50–100 g. Only a single species, the Great Thrush is, in some of its races, longer than 30 cm and heavier than 150 g, the next largest species being the Mistle Thrush (*Turdus viscivorus*). These are mainly smallish-medium to medium-large passerines with well-developed tarsi, and with a strong but relatively unspecialized bill, moderately long, deep and broad at the base, and with undeveloped rictal bristles. They have medium-length, fairly rounded wings, which are longer and more pointed in migratory species or populations, increasingly so with length of migration, and a medium-long tail, which is associated with balance during low-carriage terrestrial foraging and with manoeuvrability in escape flight. The smallest species, those in the genus *Catharus*, have proportionately the shortest tail, and the largest ones have the longest tail. Turdine thrushes forage mainly on the ground, for invertebrates, and in low trees, for fruit. Development of the bill as a blade for digging in soft earth is generally countered by its second use in plucking fruit, but two or three members of the "scaly thrush complex", namely the Sri Lanka Scaly Thrush (*Zoothera imbricata*), the Dark-sided Thrush and, in particular, the Long-billed Thrush (*Zoothera monticola*), have a bill that is considerably extended in length and depth, as an adaptation for feeding entirely or almost entirely on soil-living invertebrates. In these species, an accompanying shortening of the tail perhaps reflects the dampness of the conditions in which they operate. At the other end of the scale are the cochoas, which have a relatively short but laterally very broad-based bill, resembling that of the specialized fruit-eating cotingas (Cotingidae), and which are known to subsist on fruits of various sizes.

Subtle differences between ecologically grouped members of the genus *Turdus* illustrate various ways in which evolutionary pressures influence morphology. Forest *Turdus* are on average smaller than non-forest *Turdus*, and tropical lowland species are on average the smallest, while all the very large species are montane. Females are on average slightly smaller than males, but the variation among species is considerable. There is a fairly clear tendency for species which are dimorphic in plumage to be dimorphic also in size, and in this respect there is a relationship with migratory behaviour, as resident species, in which the pair-bond may be long-lasting, exhibit less dimorphism than do migrant species, the males of which commonly acquire new mates each year. Of over 30 species in which the sexes are alike, only



Visually, the ***Forest Robin*** *seems likely to belong alongside* Swynnertonia *and* Pogonocichla*, with which it shares the lower strata of tall African forests. Nevertheless, this impression, imparted by its orange breast, lack of rictal bristles, and permanently visible white loral spot, seems to be inaccurate. When the results of biomolecular analysis are plotted, it clusters closer to* Alethe *and* Cercotrichas *than to the main assemblage of forest robins with which it seems to have so much in common. Pending confirmation of this novel result, the traditional placement of* Stiphrornis *is maintained.*

[*Stiphrornis erythrothorax gabonensis*, near Limbe, Dikolo, Cameroon. Photo: Doug Wechsler/ VIREO]



The thirteen species of robin-chat include some of the most familiar and beautiful of African chats. Some are highly visible forms of semi-open woodlands, gardens and savanna-edge habitats, and all are grouped in the genus Cossypha, *membership of which is somewhat unstable. Quintessentially, they are characterized by a long, graduated, rufous tail with dark central feathers, often coupled with brown upperparts, orange-rufous underparts, a blackish head and a white supercilium. In these regards, the* ***White-throated Robin-chat*** *is fairly typical. Like others, it is sexually monochromatic, and its tarsi are relatively long and slender.*

[*Cossypha humeralis*, Nylsvley, Limpopo, South Africa. Photo: Warwick Tarboton]

four are long-distance migrants, whereas, of around 40 species in which the sexes are slightly or markedly different in plumage, twelve are long-distance migrants. In the Neotropics, all lowland *Turdus* species are alike in plumage, but 75% of the montane ones are slightly to markedly different in plumage, and black tends to occur in the males of dimorphic species. In the Old World, the Somali Thrush and the Yemen Thrush (*Turdus menachensis*) are very long-tailed for the size of the bird, and the Comoro Thrush and the Gulf of Guinea Thrush are very long-legged by comparison with African mainland species.

Saxicoline chats range in size from 11 cm to 35 cm and in weight from 10 g to 231 g, the great majority falling within the ranges 15–20 cm and 20–65 g. A single species, the Blue Whistling-thrush (*Myophonus caeruleus*), emerges as the largest and heaviest of all species in the family, but the figure of 231 g is an exceptionally high weight even for this hulking bird. At the other end of the scale, the Lesser Shortwing (*Brachypteryx leucophris*) is the smallest chat and the Orange-flanked Bush-robin the lightest, but the 10 g recorded for the latter represents another exceptional value and, in reality, several species, such as the smaller shortwings, akalats and stonechats, notably the Gabela Akalat and the Reunion Stonechat, are likely to have lower mean weights. This heterogeneous subfamily demonstrates a much greater span of morphological adaptations than is found in the other two. It includes some very stubby, upright-posturing, short-tailed forms, typified by *Myrmecocichla*, *Cercomela*, *Pinarochroa* and some *Saxicola*, and some svelte, low-carriaged and long-tailed ones, illustrated by some *Cossypha* species, some *Monticola* and the seven *Enicurus* forktails. Some, such as, for instance, the genera *Pogonocichla*, *Cossyphicula* and *Sheppardia*, have a broad-based bill and copious rictal bristles, designed for aerial flycatching, and others, of which *Swynnertonia*, *Cossypha* and *Luscinia* are examples, have a narrow bill and reduced rictal bristles, for gleaning from adjacent substrates. The *Brachypteryx* shortwings are well named for the particular reduction in wing length associated with their highly terrestrial existence, and the concomitant development of their legs, involving both the tarsometatarsus and the tibiotarsus, is striking. The tribally distinct forktails have strongly curved and very pointed claws for gripping surfaces of rocks adjacent to turbulent waters. These and the *Myophonus* whistling-thrushes have dense plumage to counter the cold spray of the streams by which they live.

Turdid plumages cover the entire spectrum of colours, green being supplied by a single species, the Green Cochoa (*Cochoa viridis*). Except for bright breast patches and/or underparts exhibited by a few chat genera, and discounting the opposition of black and white in several others, the colours are, however, rather muted and subtle, as befits birds of understorey habitats (see Habitat).

With the exception of the bluebirds, which are rich blue to powder-blue above, and the Boulder Chat, which is mainly black, the myadestine thrushes present a mixture of black, dark grey to silvery grey, olive-greens and olive-browns, buff and foxy-rufous to chestnut, with white occasionally appearing in the outer tail, wing and face. Again with the exception of the bluebirds, they are sexually uniform in plumage; in the case of the bluebirds, even the juveniles can be sexed by plumage, an unusual condition. Many of them show wingpanels, formed by light bases of the primaries or the primaries and secondaries, which are visible on the upperwing and underwing or, in the case of at least some *Myadestes*, on the underwing only, this latter condition suggesting a link to the turdine genera *Catharus*, such as the Russet Nightingale-thrush (*Catharus occidentalis*), and *Zoothera*.

The true thrushes, the Turdinae, for the most part make use of the same colour palette as the myadestines, but add salmon-pinks and grey-blues, and draw on an immense range of patterns based on key topographical features, including supercilia, ear-covert patches, eyerings, throat stripes, hoods, ventral spotting and scaling, flank colour and spotting, wingbars and wing spots, wingpanels and tail spots. Ventral spotting is a character displayed by most juveniles in this family, and is also a feature of the adults of various species, among them the Song (*Turdus philomelos*) and Mistle Thrushes, the "scaly thrush complex", several other *Zoothera* and *Psophocichla* in the Old World, and *Hylocichla* and most *Catharus* species in the New World. This retention of spotting in adult plumage has been considered evidence of primitive status within the relevant genus and within the family, on the basis that spotted plumage must have been the original pattern of all early thrushes and that any species showing spotted plumage today must be more directly descended from that original stock than are any unspotted species. On the other hand, it seems far more likely that such species are equally directly descended from the ancestral stock but have, presumably for adaptive reasons, retained the original spotting. Certainly, it is implausible that such a plumage would be reacquired by a species after it had evolved a different adult pattern, but it is, of course, important to understand that "primitive" in this context in no way implies maladaptation.

Albinism, which *is* maladaptive, seems to be relatively frequent in the Turdidae, and especially in the genus *Turdus*, as evidenced by the many reports of albinistic and partially albinistic Common Blackbirds from urban areas. These reports may reflect greater observer bias and interest, but more probably indicate a real circumstance, since towns are likely to be relatively safe havens against aerial predators for miscoloured birds, and perhaps are richer in the mutagens that may drive such aberration.

Among the most cryptic of the true thrushes are the twelve species of the "scaly thrush complex". These are the Plain-backed, Long-tailed, Common Scaly, Sri Lanka Scaly, Olive-tailed, Russet-tailed (*Zoothera heinei*), Fawn-breasted (*Zoothera machiki*), New Britain, San Cristobal, Guadalcanal, Long-billed and Dark-sided Thrushes. It is difficult not to think of them as among the most primitive species, given their lack of salient plumage features and their undeveloped vocal qualities. The exaggerated mud-digging bill possessed by the last two species, seen to a lesser degree also in the fairly closely related Sunda Thrush (*Zoothera andromedae*), is, however, evidence of specialization within the group, and it is noteworthy that Common Scaly Thrushes in the Himalayas, where they are sympatric with the Long-billed and Dark-sided Thrushes, have a smaller bill than that of individuals elsewhere in the species' range, evidence of modification through competition with its close relatives.

One of these close relatives, the Bassian Thrush of Australia, appears to have another, considerably more remarkable adaptation. Apart from a regular trembling of the body, thought to stimulate worms, its staple diet, to move towards the surface, J. S. L. Edington reported hearing "a noise similar to a jet of air", coincident with a downward dipping of the vent, whenever a foraging bird stopped and before it probed the earth; and each tremble was accompanied by a "very soft sound somewhat similar to an inhalational gasp". The tentative conclusion was:

> "The louder of the two noises described (that accompanied by a downward movement of the vent) may well be a 'scare tactic' to induce earthworms to contract reflexly (or other prey to move away) and so betray their presence... If the source of the louder noise is assumed to be from the quick passage of air through the vent, then the softer, antecedent noise (each accompanied by a body shiver) might be explained as aerophagia—the gulping of air. Air swallowing would naturally occur more frequently when air was passed more frequently. Such a system would be possible for a bird with a short gut."

A short-gut condition would, in turn, be possible only in a species having an exclusive or virtually exclusive dependence on earthworms, a water-rich, high-protein food resource. The result is easily the most bizarre foraging technique reported for any thrush and, arguably, for any species of bird (see Food and Feeding). This report may also be an indication of the dietary conservatism of the earliest thrushes.

Plumage differences between the sexes of the true thrushes are a common but by no means constant condition. Such dimorphism is most prevalent among species in which the males are strongly marked; this is to be expected, since females undertake more nesting duties than do males and need to remain more cryptic. Thus, in the genus *Catharus* and the African and American branches of the genus *Turdus*, in both of which the males are for the most part relatively plain and cryptic, sexual dichromatism is notably reduced. It is undoubtedly in the Himalayas and adjacent upland areas of China and Tibet that the genus *Turdus* produces its most colourful or strikingly patterned representatives, including the Grey-winged Blackbird (*Turdus boulboul*) and the White-collared, Black-breasted (*Turdus dissimilis*), White-backed (*Turdus kessleri*) and Chestnut Thrushes (*Turdus rubrocanus*), but in all cases the females are considerably less brightly coloured than the males. Rather the same applies in *Zoothera*. African and most Asian species in this genus exhibit little or no difference between the sexes, even though some are exquisitely coloured, but the Pied Thrush in the Himalayas and the Siberian Thrush in north-east Asia show startling contrasts, the males of both being dramatically black and white, whereas females of the two are almost identically brown and buff. Occasional aberrations in female thrush plumage can cause confusion, as was the case with the female Common Blackbird with boldly dappled underparts observed in Switzerland: this was identified as, and for long accepted as, that country's first Naumann's Thrush.

The saxicoline chats are, for many people, among the most attractive species of bird, and this undoubtedly reflects, in the first instance, the quality of their coloration, in terms of both tones and pattern. It is the neatness and smoothness of the plumage, and the elegantly understated way in which patches of brightness are incorporated into, and offset by, the refined shades of



Although the genus Luscinia *contains the dull-plumaged, sexually monomorphic but vocally spectacular nightingales, not all of its members are unreservedly brown. In eastern Asia, in particular, the genus has radiated into a variety of forest-dwelling forms, males of which are characterized by gorgeous plumage. Some are emblazoned with vivid patches of rufous or black, particularly on the gorget, while others possess a blue that is almost glossy in its brilliance. One such is the* ***Siberian Blue Robin****, a relatively slim, terrestrial chat of dense, damp undergrowth. It breeds in northern taiga forests and migrates south to South-east Asia in winter.*

[*Luscinia cyane bochaiensis*, Yamanasi, Japan. Photo: Hirozo Maki]

brown on so much of the upperbody feathering, that make these birds so compelling. Taking males as standard, these species are typically dark brown and rufous, dark and light brown and rufous, grey and rufous, or slate-blue and rufous, all commonly with some black and white, usually on the head or tail; or they are simply black and white. The tail pattern is often distinctive. Major genera, such as *Monticola*, *Cossypha*, *Luscinia*, *Tarsiger*, *Erythropygia*, *Copsychus*, *Phoenicurus* and its close allies, *Saxicola*, *Cercomela*, *Oenanthe* and *Enicurus*, which together account for about 65% of all chats, have well-marked tail patterns involving, in most cases, dark brown and rufous or black and white.

Such tail patterns are used in intraspecific and, perhaps, sometimes interspecific signalling, often being displayed only when the bird flies a short distance. Species in the genera listed above, however, commonly make rapid "involuntary" tail movements such as quivering, wagging, cocking or fanning, sometimes in combination, which serve to emphasize the features of the tail. Some of them, usually the more terrestrial species of semi-open country, such as *Erythropygia*, *Phoenicurus*, *Copsychus* and *Enicurus*, along with *Xenocopsychus* but including also *Saxicola*, add white markings in the wing to complement or reinforce the tail pattern.

Species having an unpatterned tail have other signalling strategies. Two long-tailed ground-haunting taxa, the monotypic *Saxicoloides* and *Cinclidium*, make exaggerated tail movements, including flipping, twisting and cocking, which simply emphasize the length of the tail, but they also have, as do *Myophonus* and *Myiomela*, bright "shoulder" patches which convey information. Other saxicolines may at least partly replace tail movements with wing movements. Examples are open-country species such as those in the genera *Thamnolaea*, *Myrmecocichla* and *Pentholaea*, which have white marks on the head and, especially, the wings, the latter marks often being displayed best as a panel when the bird is in flight or when its flicks open the wings. On the other hand, species frequenting deep-shaded undergrowth, such as the shortwings, share with several other plain-tailed genera, including *Pogonocichla* and *Sheppardia*, a disclosable area of white above the eye which is evidently used as a short-distance signal in certain social contexts, presumably mainly aggression and attraction in connection with, respectively, territorial conflict and breeding. The striking and generically anomalous black-and-white plumage configuration of the Blue-capped Redstart (*Phoenicurus caeruleocephala*) appears to be an appropriate signalling device in the shadowed understorey of the open forest in which it lives. Several other chat species which dwell on or near the ground in heavy cover show similar use of dark blue and white. These are the White-bellied Redstart (*Hodgsonius phaenicuroides*), the Siberian Blue Robin (*Luscinia cyane*) and, as noted, three species of shortwing, including the Great Shortwing.

In this regard, the whistling-thrushes are of particular interest owing to the recent discovery of their apparent or probable ability to signal through ultraviolet (UV) reflectance. Their shiny blue patches are mostly confined to the forehead and "shoulder", although some species possess spangling on the body plumage, too. It seems likely that several other chat genera also use UV reflectance as a signalling mechanism. For example, both *Cinclidium* and *Myiomela* have the same glistening violet-blue forehead and "shoulder" as those of *Myophonus*. Such adaptations are presumably associated with territorial or dominance behaviour in deep shade.

Ultraviolet reflectance is not, however, confined to deep-shade taxa. In the genus *Luscinia*, there are several species which are arguably the most widely appreciated of all the chats, united by their incorporation of bright red into the throat and/or breast patterns of males. These are the Siberian and White-tailed Rubythroats, the Firethroat, the Indian Blue Robin and, most notably, the Bluethroat. This last species complements its chestnut-red throat spot and/or breastband with a bright metallic blue chin and breast which has been found to be UV-reflectant, and which demonstrates the kind of uses to which colour patches of chats are put. In experiments, males with this UV reflectance reduced by sunblock chemicals, but to human eyes appearing



The genus Erithacus *has fluctuated in its limits as much as any over the last few decades. At times it embraces the nightingales and robins in the genus* Luscinia, *or expands still further to include an assortment of vaguely related Asiatic and African genera, such as* Tarsiger *and* Swynnertonia. *Nevertheless, the original "robin", the* ***European Robin****, differs significantly in the quality of its voice, the texture of its plumage, and its overall structure and stance, as well as the colour pattern of its eggs. Nowadays, it is generally reckoned to deserve isolation in a monotypic genus.*

[*Erithacus rubecula*. Photo: F. Rauschenbach/ CD-Gallery]



The taxonomic sequence leading from Luscinia, *through* Erithacus, *to* Tarsiger, *is designed to follow a subtle stepwise progression in behaviour and body structure. Thus, the quintet of species placed in* Tarsiger *occupies the most slender, least terrestrial end of the continuum. The form with the widest distribution, breeding from the Finnish highlands to the mountains of Japan, is the* ***Orange-flanked Bush-robin****. Like its congeners it is a delicately proportioned, mainly arboreal chat with a fine, warbler-like bill. The stunning males are often unobtrusive, except in the breeding season when they rise to prominent song-perches, showing off their colours to good effect.*

[*Tarsiger cyanurus cyanurus*, Kuusamo, Finland. Photo: Markus Varesvuo]

identical to "normal" males, were largely avoided by females, indicating that the females of this species use UV colour vision in mate choice. Moreover, UV reflectance was found to be lower in first-year males than in older ones, indicating that greater sexual status is enjoyed by older males compared with younger males. The spectral purity of the blue feathering is associated not only with age, but also with greater levels of paternity in males' own nests, and with greater fertilization success with females other than the mate. Indeed, the extra-pair offspring in a nest have been found to be more "immunocompetent", which is thought to be an indicator of better health, than are within-pair offspring in the same nest. This suggests that a male's blue breast signals his overall physical and genetic condition and is the basis for a female's mate selection either through forming a pair-bond or, failing this, by surreptitious extra-pair copulation. Almost certainly the same considerations apply to the bluebirds in the subfamily Myadestinae. It has been found that Eastern Bluebird (*Sialia sialis*) males having larger breast patches and brighter plumage provision the nestlings more often, fledge heavier offspring, and pair with females that nest earlier, and that males with more UV hues in their plumage fledge more offspring. These results point to plumage coloration as being a reliable indicator of a male's mate quality and of his potential reproductive success.

Choice of sexual partner by the female may be more critical in temperate climates, perhaps because food is seasonally so abundant that the provisioning of nestlings is something that she can accomplish largely, albeit not typically, on her own. Hence, females of temperate-zone species may be more free to pursue the benefits of extra-pair copulations, because they are less dependent on the paternal care that they might forfeit. In such species in which female choice is strong, one might expect strong sexual differences in plumage. The pattern of sexual plumage dimorphism is not, however, clear-cut. Among the saxicoline genera, the sexes are the same in 16 (*Pseudalethe*, *Alethe*, *Cichladusa*, *Heteroxenicus*, *Pogonocichla*, *Cossyphicula*, *Stiphrornis*, *Sheppardia*, *Cossypha*, *Xenocopsychus*, *Erithacus*, *Erythropygia*, *Cercotrichas*, *Chaimarrornis*, *Cercomela*, *Pinarochroa*); the sexes are different in 17 (*Brachypteryx*, *Heinrichia*, *Grandala*, *Monticola*, *Thamnolaea*, *Pentholaea*, *Swynnertonia*, *Irania*, *Tarsiger*, *Trichixos*, *Saxicoloides*, *Phoenicurus*, *Rhyacornis*, *Hodgsonius*, *Cinclidium*, *Saxicola*, *Campicoloides*); and the situation is mixed in seven (*Myophonus*, *Myrmecocichla*, *Luscinia*, *Copsychus*, *Myiomela*, *Oenanthe*, *Enicurus*). Interestingly, of the 16 sexually undifferentiated genera, as many as 13, or 81%, are almost exclusively African, while twelve (71%) of the 17 sexually differentiated ones are largely or wholly Asian. The explanation for this is probably phylogenetic. At least, there is no obvious correlate of these biases in terms of ecology, including habitat, foraging stratum and technique, and breeding pattern, but only one of the first group, *Erithacus*, is a temperate genus, whereas eight of the second (*Grandala*, *Monticola*, *Irania*, *Tarsiger*, *Phoenicurus*, *Hodgsonius*, *Saxicola* and *Campicoloides*) are at least partially temperate in distribution. Species in which brown and rufous tones are dominant tend to be sexually uniform, while those with black or blue in the plumage, at least that of the male, tend not to be.

Of course, whether the problem of sexual differentiation is as great for the birds themselves as it can be for human eyes is by no means certain. Subtle plumage cues may be perfectly sufficient, irrespective of behavioural ones, but, in the avian world in general, greater explicit monogamy prevails among species showing little or no obvious sexual difference in plumage.

One subtle cue, involving neither plumage nor a sexually monochromatic species, but still evidence of an interesting discriminatory capacity, concerns the bill coloration of the Common Blackbird. Again, this appears to be an important but involuntary, and therefore honest, signal of individual health. Male Common Blackbirds possessing a more orange bill are chosen by females in better body condition, and enjoy higher reproductive success than do yellower-billed individuals. Males with a brighter bill also seem to pose a more objectionable threat as rivals, since mounted male blackbirds having a more deeply orange bill are more heavily attacked by neighbouring males than are those with a merely yellow bill. The explanation is neat. Carotenoids that colour the male's bill also perform an important function in the immune system, notably as free-radical scavengers that reduce oxidative stress on cells. Hence, a male with a deep yellow or orange-tinged bill is honestly signalling his physical and genetic quality as a prospective mate, since he has sufficient carotenoids to produce a bright signal over and above his requirements for immune defence. In feathers, such colours reflect state of health at the previous moult, but carotenoids circu-



At its most inclusive, the genus Cercotrichas *contains ten species of scrub-robin, most of which are largely terrestrial birds with long, steeply cocked tails and frontally scutellated tarsi. These features, plus the absence of a spotted juvenile plumage, led to them being placed with the sylviid warblers for many years. Although relatively homogeneous, the group is now broken into two, with all but one species removed to* Erythropygia. *This could potentially be further subdivided into four long-billed tall-forest species and five shorter-billed scrubland species, the latter typified by the* ***Red-backed Scrub-robin****, a common bird in drier habitats of East Africa.*

[*Erythopygia leucophrys*, Kenya.
Photo: Michael Gore]

lating in bare parts may change in concentration over short time periods, thus giving accurate, up-to-date information about a male's condition. In the case of the yellow bill of male Common Blackbirds, the yellow or orange colour has been found to decrease rapidly in intensity following the experimental activation of their immune systems.

In carotenoid-based coloration, males cannot "bluff" at being of superior quality than they really are, since they do not have the resources at their disposal. This is a situation shared with the male Black Wheatear (*Oenanthe leucura*), the extravagant behavioural display of which involves the collecting of stones and the placing of them in the vicinity of the nest, while the female is present. This display is energetically costly, and only the healthiest males can collect large stones, which may weigh a quarter of the male's own body mass; as many as 10 kg of stones may be accumulated in a season. Calculations suggest that individual stone-carrying trips involve a muscular power output of 400 W per kg, the largest expected for any species of bird. The male's wing morphology is specially adapted for carrying heavy loads, with a low wing-loading compared with that of the female. Males carrying the greatest loads have the lowest wing-loading and appear to be in better health, since they were shown to be better able to defend themselves against an experimentally simulated infection than were males with lighter piles of stones to their credit.

This does not necessarily mean, however, that male turdids are always larger, heavier and more powerful than the females. In the case of some South American *Turdus* thrushes and the Andean Solitaire, at least, there seems to be a trend for females to be marginally heavier than males, although this needs to be formally evaluated. Weights of all species can change dramatically with circumstance, and on a daily basis as much as a seasonal one, as the following examples demonstrate. The White-chested Alethe (*Pseudalethe fuelleborni*) is heavy at the start of the breeding season, light while feeding young, and heavy again when moulting; the weight loss during the brood-feeding stage is due to the necessary diversion of limited resources by the parents. The current lowest and highest known weights of Swainson's Thrush (*Catharus ustulatus*), 25 g and 31 g, respectively, were taken from the same individual six days apart, before it resumed its spring migration. As a final example, the usual weight range for a healthy adult Fieldfare (*Turdus pilaris*), at least during the winter, is 105–115 g, but individuals weighing up to 140 g and more have been recorded. A weight of around 65 g, approaching 55% of the upper limit of its normal body mass, is regarded as a critical threshold for this species; below this level, Fieldfares have relatively little chance of survival without an immediate improvement in condition.

High weight almost invariably correlates with good body condition, and heavier individuals in a population are likely to be socially dominant and more capable of surviving adverse short-term conditions. Nevertheless, a study of fat levels in Common Blackbirds wintering in Italy did not reveal greater survival, ei-



Like the Hypsipetes *bulbuls, the genus* Copsychus *is largely Asiatic but representatives have colonized Indian Ocean islands as far afield as Madagascar. Although treated as a single entity, the genus is subdivided by English name, the shorter-tailed species being called "magpie-robins", and the longer-tailed species "shamas". The* ***White-rumped Shama*** *is typical of the latter in being less brazen and terrestrial, and more a reclusive songster of the humid forest understorey. So beautiful and powerful is its voice, in fact, that it is one of the most popular cage-birds in South-east Asia.*

[*Copsychus malabaricus interpositus*, Khao Yai National Park, Thailand.
Photo: Bernard Van Elegem]



*The **Indian Robin** has often been included within* Copsychus *on account of similarities in stance and plumage. Its well-developed and scutellate tarsi are unique, however, as are the slight decurvature of the bill and the oddly pointed wings. In addition, the tail is differently employed, being dipped in a leisurely manner when hopping about on the ground, rather than cocked more jauntily. These anomalies justify its placement in a monotypic genus and hint at a phylogenetic background perhaps rather remote from the magpie-robins; they are also responsible for the suggestion that it is actually a babbler (Timaliidae), or a bridge towards the accentors (Prunellidae).*

[*Saxicoloides fulicatus*, India. Photo: Konrad Wothe]

ther within or between years, among those with higher reserves; this was either because the environment in Italy is not harsh enough to test the blackbirds' endurance or because heavy, and hence presumably slower, individuals run greater risks of predation. Such persistent environmental checks and balances lie behind the subtle differences in body size that can evolve over long periods in widespread species. American Robins, for example, are smallest in the warm, humid eastern USA, and largest in the high, cool and dry Rocky Mountains, northern Great Plains and northern deserts, and individuals in these latter regions have more pointed wings. This species' bill length varies concomitantly with general size, except that, for whatever reason, the longest bills are found in the isolated population in the mountains of southern Baja California, in west Mexico. The legs are relatively short and the plumage pale in Mexico, whereas these morphological characters are, respectively, long and dark in the cool maritime forests of Newfoundland, in east Canada. Thus, despite Gloger's Rule, the darkest plumages of the American Robin are not in the most humid regions, the south-eastern USA, but, rather, in cool areas where air saturation is high.

Size and coloration of thrushes also vary slightly with age. Adult Fieldfares tend to be marginally larger than first-year birds, the difference between old and young males being more pronounced than that between old and young females. The same is true of Common Blackbirds, using wing length as an indicator. In some species of chat, first-year males are much like females, and they often breed in this plumage. The same has been observed for an increasing number of species in the genus *Turdus*, but for these, although it is not so rare a phenomenon as was once thought, it is still very uncommon. In contrast, it is the norm for Black Redstarts, but there is as yet no explanation of why up to 90% of first-year males of this species retain female-type plumage even though they enter the breeding population. Most such birds are marginalized in suboptimal habitats and achieve poor reproductive success, whereas first-year birds with male-like plumage fare much better. As with yearling Bluethroats and their lower levels of UV reflectance, there may be ineluctable physiological constraints on these young redstarts which inhibit the rapid acquisition of full male characteristics.

Adult thrushes and chats, at least in temperate climates, undergo one complete moult annually, involving the replacement of all feathers in the weeks following the conclusion of breeding. In some species of apparently only two genera, *Monticola* and *Luscinia*, this moult produces a moderately distinct non-breeding plumage, in which the bold colours of the underparts are partly obscured by buff feather tips. Details of this moult process are fundamentally the same as those for all passerines. The replacement of the body feathers proceeds rather protractedly in tandem with that of the flight-feathers. The flight-feathers are moulted individually or in groups of two or three, beginning with the innermost primary, P1, and continuing outwards symmetrically to the wingtip, with P10 last. Replacement of the tertials and median wing-coverts is slightly staggered behind the primary moult, and is followed by the shedding of the outer greater coverts and then the inner coverts. Moult of the secondaries begins only when the primary moult is well advanced, and proceeds in the opposite direction, from the outermost secondary inwards towards the already replaced tertials. Replacement of the tail feathers and the tail-coverts commences soon after the start of the primary moult, the feathers being replaced from the central ones outwards, not always symmetrically, and is completed, at least in temperate species, in about 3–4 weeks. Altogether, however, the duration of the post-breeding moult is around twice as long, the contour feathers of the body often taking 7–8 weeks to be fully replaced. In the case of the Northern Wheatear, females may sometimes be two weeks later than males in the timing of the moult, and doubtless certain other species show similar variations.

In the tropics, the process may be much more staggered and protracted. The mean duration of individual moult of 17 White-chested Alethes was 176 days. Moreover, it commonly overlaps partly with the reproductive cycle. In South Africa, for example, about 4% of adult Cape Robin-chats (*Cossypha caffra*) in the south-western Cape, a winter-rainfall region, begin to moult as early as late September, and another 20% in October, but the majority start in November and have completed the primary moult by early February. In summer-rainfall areas, the moult probably commences at least two months later and is often not completed until April.

The juvenile moult, from typically spotted plumage into first-year dress, begins slightly later than that of adults. It is normally only partial, involving a proportion of body feathers and wing-coverts and not extending to the flight-feathers or tail feathers, although juveniles of some tropical species can undergo a complete moult. Early and more southerly broods of some species



The typical redstarts belong in Phoenicurus, *a genus containing eleven species with Palearctic breeding ranges. When foraging, they employ sit-and-wait tactics, and for this reason they tend to perch with an upright stance, like flycatchers (Muscicapidae), and their slender bills are surrounded by distinct rictal bristles. Another recurrent feature, and that which gave rise to their name, is a fiery orange rump and outertail. In most species the tail itself is shivered diagnostically. Some redstarts breed in deep forests, others in scrub, and a few, including* ***Güldenstädt's Redstart****, restrict themselves to bare terrain above the tree-line.*

[*Phoenicurus erythrogastrus grandis*, Yoye-Tso, Ladakh, India. Photo: Otto Pfister]

often replace a larger number of greater coverts than do later or more northerly ones. In the Northern Wheatear, this moult commences at about the sixth week and lasts until the eleventh week, and is thus completed in approximately 4–5 weeks. Similarly, the White-throated Robin-chat acquires an adult plumage pattern in the tenth to eleventh week of life. By way of contrast, the moult of the juvenile Rufous-capped Robin-chat (*Cossypha natalensis*) extends over three months. Juveniles generally leave the natal territory before commencing moult, which is undertaken in silence and seclusion. Following this moult, age determination of first-year and adult birds is often dependent on the colour and degree of abrasion of the fringes of the wing-coverts. In the genus *Turdus*, at least, adults and first-years can be distinguished by the appearance of the secondary coverts, the immature forms of which are, in almost all cases, retained for the year from the post-juvenile until the first post-breeding moult.

Most passerines have no pre-breeding moult, and any increases in the intensity of coloration of breeding individuals are due to abrasion. There are, however, some exceptions. Some temperate species, both as adults and as first-years, have a partial moult prior to the onset of breeding during which they replace some of the body feathers and wing-coverts. This moult, which is much less obvious or intensive than the post-breeding moult, can commence in January and continue into early April, and for several *Turdus* thrushes it proceeds gradually throughout the winter months. In the case of the Siberian Blue Robin, the wings and tail are not moulted in winter, but a complete moult of the body plumage takes place from November, proceeding gradually until February and then becoming intensive in March–April. Migrant species usually have to divert energy first into the growth of feathers and then into fat deposition, although experiments with Bluethroats demonstrate that, if constrained, they can achieve both. Tropical species such as the White-chested Alethe can, as noted above, regain weight during the moult, since the requirement for strong new feathers prior to migration is not present and the whole process can therefore be extended.

Habitat

The span of habitats utilized by the thrush family is reflected in the vastness of its geographical spread. What other family of birds has representatives billeted in the depths of many of the world's tropical and temperate forests, in the harshest deserts of the Old World, in the heart of many industrialized cities, on some of the remotest islands of the three main oceans, above 5000 m in African and Asian mountains, and in the high-Arctic tundra? Only in wetlands can the thrushes and chats be said to have failed, not having the lightness of body and the flexibility of feet to perch in perpendicular vegetation, for they are, emphatically, birds with strong terrestrial habits and thus, for the most part, unadapted for life in wetlands. Even so, streamsides are used by whistling-thrushes, water-redstarts and forktails, damp fringes by the genus *Luscinia*, and intertidal shorelines by the Familiar Chat, the Tristan Thrush and, more occasionally, others, including various European *Turdus* species.

Very possibly the thrushes arose as forest birds, living dual lives, as many still do today, on the shaded forest floor, seeking invertebrate food, and in the higher parts of trees, where they sing, nest, take fruit and find refuge. This duality of terrestrial and arboreal existence is the key to the family's success, for with it came the capacity to move into ever more open, disturbed habitats, and eventually, in the case of some species and genera, to replace the shelter provided by trees with that offered by rocks and cliffs. Indeed, many of the commonest and most successful thrushes on earth today are adapted to the interface between wooded and open country, and have probably greatly profited from the anthropogenic fragmentation of continuous landscapes, mainly by forest incursions but also by the planting of copses, orchards and hedgerows in extensive grassland areas. Examples are, in the Turdinae, the Common Blackbird, the American Robin, the Mistle Thrush, the Redwing (*Turdus iliacus*), the Fieldfare, the Clay-coloured Thrush (*Turdus grayi*), the Great Thrush, the Rufous-bellied Thrush (*Turdus rufiventris*), the Austral Thrush, the Olive Thrush, Naumann's and Dusky Thrushes, and Rufous-throated and Black-throated Thrushes; in the Saxicolinae, one could mention such species as the White-browed Robin-chat (*Cossypha heuglini*) and the Oriental Magpie-robin. The modern adjustments of the Oriental Magpie-robin, which probably originated in the light forest of the subtropical belt, were wryly remarked upon by H. R. Caldwell and J. C. Caldwell in China: "It is one of the inconsistencies of nature, being beautiful and trim, graceful and proud to extremes, yet given to visit every dung pit and place of filth in the community". Some of these changes have taken place



Tacked on to the end of the "true" redstarts in the taxonomic sequence are the water-redstarts in the genus Rhyacornis. *These two species seem closely related to* Phoenicurus, *judging by their similar structure and behaviour, although their tail is habitually waved or flashed open, rather than briefly shivered. As their name suggests, both species are strictly tied to watercourses: the* ***Plumbeous Water-redstart*** *is rarely seen away from the banks of narrow clear-water streams or broader torrents, where it sallies from low perches, walks along banks, and even wades in the shallows in search of water-borne prey.*

[*Rhyacornis fuliginosa fuliginosa*, Corbett National Park, India. Photo: Konrad Wothe]

very recently: the Common Blackbird did not begin to invade cities until the mid-nineteenth century, and there are areas in the south-east of its range where this process is still in train.

When the Anglo-Saxons called the Fieldfare *feldefare* they meant "field-traveller", which is a good description of the bird's habits, so often seeming to be on the move over the open ground that the early farmers of Britain had created in the island's then extensive forests. The name does, however, miss an important point: that the species is no less dependent on the forest adjacent to the fields for shelter at night and for cover from predators by day. Indeed, trees and bushes, although not necessarily many or large, are crucial components of the habitat of the great majority of thrushes and chats. The family occupies the spectrum of wooded habitats from tall primary forest down to the lowest scrub, and most turdids exploiting open fields and grassland almost always stay within a minute or two's flying distance of cover. The distribution of the family through this spectrum is not one of greatest abundance in primary forest and least abundance in low scrub. The proportion of species in primary forest is not particularly high, but increases substantially with secondary and edge habitats. This is because of the high seasonal use made of berries and fruit, which are temporarily much more abundant in regenerating areas. Primary forest holds various species of understorey-haunting chat, but the proportion of chats surpasses that of true thrushes as the canopy diminishes in height and breaks into patchy scrub and shrubbery, until eventually, when only scattered bushes remain, only saxicolines are left.

The myadestine thrushes, being the least terrestrial, are the most strongly bound to trees, and all of them, even the Boulder Chat, require forest, forest edge, woodland or parkland. Whether such habitat selection enhances the view that they are the most primitive turdids is a matter of debate. Certainly, the true thrushes, those in the subfamily Turdinae, are far more flexible and extend from forest into open lands with adjacent tree cover, and a very few species, or populations of species, have ventured farther. The Ring Ouzel (*Turdus torquatus*) can survive on heathland and moorland entirely without trees, although this is unusual and, in any case, applies only in Britain and only in the summer; equally, the Island Thrush in the Snow Mountains of New Guinea has substituted rock and cliff cover for trees, but this switch applies only to this single population. Similarly, the Austral Thrush substitutes tussac grass for tree cover on some islands in the Falkands, and the Tristan Thrush apparently does likewise in some parts of Tristan da Cunha. The saxicoline chats, however, have achieved far greater emancipation in a number of taxa, namely *Grandala*, several species of *Monticola*, *Myrmecocichla*, *Chaimarrornis*, some species or populations of *Saxicola*, *Campicoloides*, most *Cercomela* species, *Pinarochroa* and most of the *Oenanthe* species. Of all the saxicolines, perhaps as many as 40 species, or 22%, of which about half are wheatears, are not dependent on trees, although the Grandala will, perhaps facultatively, visit orchard trees in autumn.

Habitat selection in birds is driven by several factors intrinsic to the birds themselves, principally the need for appropriate

The genus Cinclidium *has recently been disrupted because the type species, the Long-tailed Blue Robin* (C. frontale), *is now deemed sufficiently distinctive to warrant its own private genus. This leaves two erstwhile members, plus two new recruits, to populate the resurrected genus* Myiomela. *The Javan and Sumatran form, the* ***Sunda Blue Robin****, is typical of this quartet in its dark blue plumage with paler highlights, and its fondness for hiding away in the gloomy understorey of humid submontane forests. It is usually seen on pathside perches, a metre or so up, but it sometimes forages on the ground.*

[*Myiomela diana*. Photo: Roland Seitre]



space in which to feed, to breed, to sing and to shelter, and by several extrinsic factors, including interspecific competition, predation pressure and disturbance levels. A species' niche width, the degree of its ecological flexibility, is a measure of the stability and predictability of its habitat, but is very difficult to assess. For the Turdidae, the combined use of ground and perch has, as indicated, been highly liberating in terms of ecological radiation and niche occupancy, and their levels of specialization, in terms of year-round dependency on one or a few key resources, are, for the most part, not acute. There are a few examples of the latter. Bicknell's Thrush appears to select high-density stands of balsam fir (*Abies balsamea*), leaving other areas of forest within its small range empty, even though they are also empty of its close congeners; and two of the three *Cichladusa* palm-thrushes have a particular but not obligate association with various African palm trees. In Africa, the White-chested Alethe, in order to breed successfully, must have access to army ants, preferably with an ant colony on its territory or else in adjacent areas; similarly, the Northern Anteater-chat (*Myrmecocichla aethiops*) normally requires termitaria as a component of its habitat. It may well be, however, that the most specialized species of all are the least tree-dependent group, the wheatears, since habitat selection and foraging niche in this genus seem to be determined by extraordinarily subtle differences. These are discussed further at the end of this section.

Among forest-dwelling thrushes, specialization is in part definable by sensitivity to habitat alteration. For several species, such alteration is primarily and simply a matter of habitat fragmentation. The Varied Thrush, for example, responds poorly to discontinuity in old-growth stands, and is almost invariably absent from patches less than 16 hectares in extent, even if conditions are apparently suitable in all other respects. The reasons for this are not clear, but a similar phenomenon in another North American turdine, the Wood Thrush, is explicable in terms of increased mammalian and avian predation pressure. In one study of this species, 86% of nests in continuous forest were successful, compared with 72% in large fragments of more than 100 hectares, and 43% in fragments smaller than 80 hectares; rates of predation were only 10% within the continuous forest and 22% in large fragments, but as much as 56% in small fragments. Higher predation levels in forest fragments suggest that most predators are species of the forest edge and/or that many benefit from anthropogenic conditions on the periphery of fragments. In the case of the Varied Thrush, predation may have no relevance, and the problem may relate, instead, to home-range size and foraging-substrate availability; even though "territories" may be as small as 7 hectares, it is possible that this species requires far larger areas over which to collect food.

Even when forest cover is continuous, however, Wood Thrushes do not escape the risks of predation, and distinct changes in use of forest habitat occur with changes in this risk. Of 61 radio-tagged adults in one forest in northern Virginia, 30 remained for the full two months after breeding, during which time they underwent the complete post-breeding moult (see Morphological Aspects). Of these 30, eleven remained on their territories, while 19 moved to stands of deciduous saplings adjacent to or up to 7 km from their territories. From this, it appeared that the thrushes were selecting vegetation the structural attributes of which, such as density of the understorey, gave them greater protection against predation, presumably by raptors. Wing and tail moult inevitably result in slightly impaired flight efficiency, so the use at this time of screening vegetation, even if possibly less suitable in terms of foraging opportunities, would help to compensate for the birds' temporarily increased vulnerability. Meanwhile, the juvenile Wood Thrushes also moved to patches with a dense understorey, dividing their time before later August among (a) second-growth scrub/deciduous sapling sites located along forest borders and abandoned farms, (b) deciduous forest damaged by gypsy moth (*Lymantria dispar*) infestation, and (c) Virginia pine (*Pinus virginianus*) forest with a heavy deciduous understorey. Such cover is doubtless valuable to juveniles, which are inevitably less experienced than are the adults, but, in contrast to the latter, their flight-feathers are new and complete at this stage, so that, in their case, the greater benefit of using such habitat probably lies in the high density of fruit then to be found in it. Either way, it is instructive to conservationists that simply to focus all effort on preserving open-understorey forest, the Wood Thrush's main breeding habitat, would clearly be a mistake. Gratifyingly, a parallel, independent study of Wood Thrushes in southern Missouri reached the same conclusion: in large tracts of mature deciduous forest, a mosaic of early-successional and mid-successional forest stands, along with mature riparian forest, is essential in providing both breeding and post-dispersal habitat.

Multiple use of habitat over the breeding season is also important in the breeding success of the White-throated Thrush. Recent work in Costa Rica, again using radiotelemetry, found



*The **Common Stonechat** has successfully colonized the Palearctic from the British Isles to Japan, and Africa south to the Cape of Good Hope. It (or a close relative) has reached islands such as the Canaries, Madagascar and Reunion. As a corollary of this success, it has diversified into a plethora of forms, some of which are treated here as separate species. The recent tendency has been to split this stonechat into an African, a European and an Asian species, a proposition that seems attractive when viewing the resultant nominates, but virtually untenable when assessing variation within each group. All continental forms are retained here as a single polytypic taxon.*

[*Saxicola torquatus rubicola*,
Ventas Blancas,
La Rioja, Spain.
Photo: Eduardo Ayala]

that most fledglings of this species, whether raised in cattle pastures or in coffee plantations, move into forest when they leave their nesting habitat, and that fledglings remaining in agricultural habitats, namely coffee or pasture, are less likely to survive until brood dispersal than are those that move into forested areas. Thus, although White-throated Thrushes can nest successfully in agricultural habitats, the utilization of forest positively influences the survivorship of young during the period of post-fledging dependence. For the European Robin, too, breeding success is correlated not with territory size but, instead, with vegetation density, the speculation being that thicker cover may provide more food and/or more protected nest-sites and/or better refuge from predators.

Work on Common Blackbirds and Song Thrushes in Britain and elsewhere has tended to produce similar kinds of evidence, but is less conclusive with regard to the factors influencing success or failure up to the point of fledging. In one study, it was found that Common Blackbirds make uneven use of woodland, leaving some areas empty, occupying others at low density, and clustering in others in "hotspots". The hotspots were characterized by having the greatest habitat complexity, and blackbirds nesting in them tended to achieve better breeding success than did those in sparsely occupied woodland or in adjacent farmland. Song Thrushes, too, fare poorly as landscapes become more simplified. In the 25 years from 1970 to 1995, this species' populations in lowland rural Britain declined by approximately 70%, most severely so on intensively managed arable farmland. Comparison between a stable population on mixed farmland and a rapidly declining population on arable farmland demonstrated that lack of woodland and grassland, and the faster drying of surface soils in the arable landscape, combined to limit the availability to thrushes of earthworms, the species' key summer invertebrate prey. The steady loss of hedgerows, scrub and permanent grassland with livestock, together with the widespread installation of under-field drainage systems, has reduced the complexity and viability of modern farmland as an ecosystem that can support Song Thrushes (see Status and Conservation).

Of course, individuals that fail to select optimal habitat, habitat covering all of their various biological needs over the year, are very possibly excluded from that habitat by other members of the same species. The habitat of the European Robin in the non-breeding season is influenced by the sex, age and body size of individuals. In northern Europe, adult males tend to occupy the habitats in which winter survival is most probable, while many females and juveniles migrate. In Spain, winter immigrants, many of them therefore females and first-years, tend to inhabit scrublands, such immigrants making up 60% of the robins present in scrubland, but only 30% of those in woodland. Individuals spending the winter months in woodlands achieve better condition than do those wintering in scrubland, even though food is more abundant in the latter, indicating that other features of woodland, for example shelter, must count in its favour. Because of this difference, it has been assumed that the partitioning of habitats approximately between males, on the one side, and females and young, on the other, is not driven by specialization but, rather, simply by social dominance. Over time, however, this circumstance of dominant male in one habitat and subordinate female in another would inevitably select for individuals best able to survive in the latter, and hence would lead to specialization. Interestingly, evidence of this has been found in southern Italy, where European Robins occurring in different habitats differed from one another not only in body size, measured in terms of wing, tail and tarsus lengths, but also in bill length and volume. Subordination is, in any case, no reason for scrubland-wintering robins not to be highly defensive of what little they have. Several studies have shown that, in the non-breeding season, European Robins occupy territories encompassing a number of key features between which the individual moves and to which it mainly sticks, making a core area as small as 0·037 hectares, or a perimeter of only 74 m, used for feeding, shelter, roosting and vigilance. Utilization of territory space is thus non-uniform and multi-nuclear, the robin spending up to 78% of its time in one or more resource patches, chiefly bushes, that may represent only 1% of its whole territory.

Bicknell's Thrush exhibits a similar division of non-breeding habitat by the sexes, males appearing to predominate in primary montane forest and females in mid-elevation, moderately disturbed forest. In Austria, female Common Blackbirds in countryside adjacent to urban areas appear to be forced into the urban areas in winter. Conflict between males and females over resources appears to be common among thrushes and chats, resulting either in habitat-partitioning or, alternatively, in longer-distance migration by females to what are likely to be somewhat different and, arguably, suboptimal habitats. This is not, however, always the rule. In the USA, Hermit Thrushes (*Catharus*



The African radiation of Cercomela *chats includes eight species, all of which are dull greyish birds with black or patterned tails. They are more terrestrial than* Saxicola*, but less so than* Oenanthe*, and are thus postulated to provide a bridge between the two. The* ***Tractrac Chat*** *is representative in its sombre dress, its modest song, its residence in deserts or semi-deserts, and its love of the wires and fences that criss-cross the Karoo and Namib plains; these last provide useful vantage in stark, treeless country, and are often used by foraging* Cercomela *chats. The common call of this species is the gravelly disyllable celebrated in its onomatopoeic name.*

[*Cercomela tractrac*, 60 km east of Swakopmund, Skeleton Coast, Namibia. Photo: Christophe Courteau/Bios]

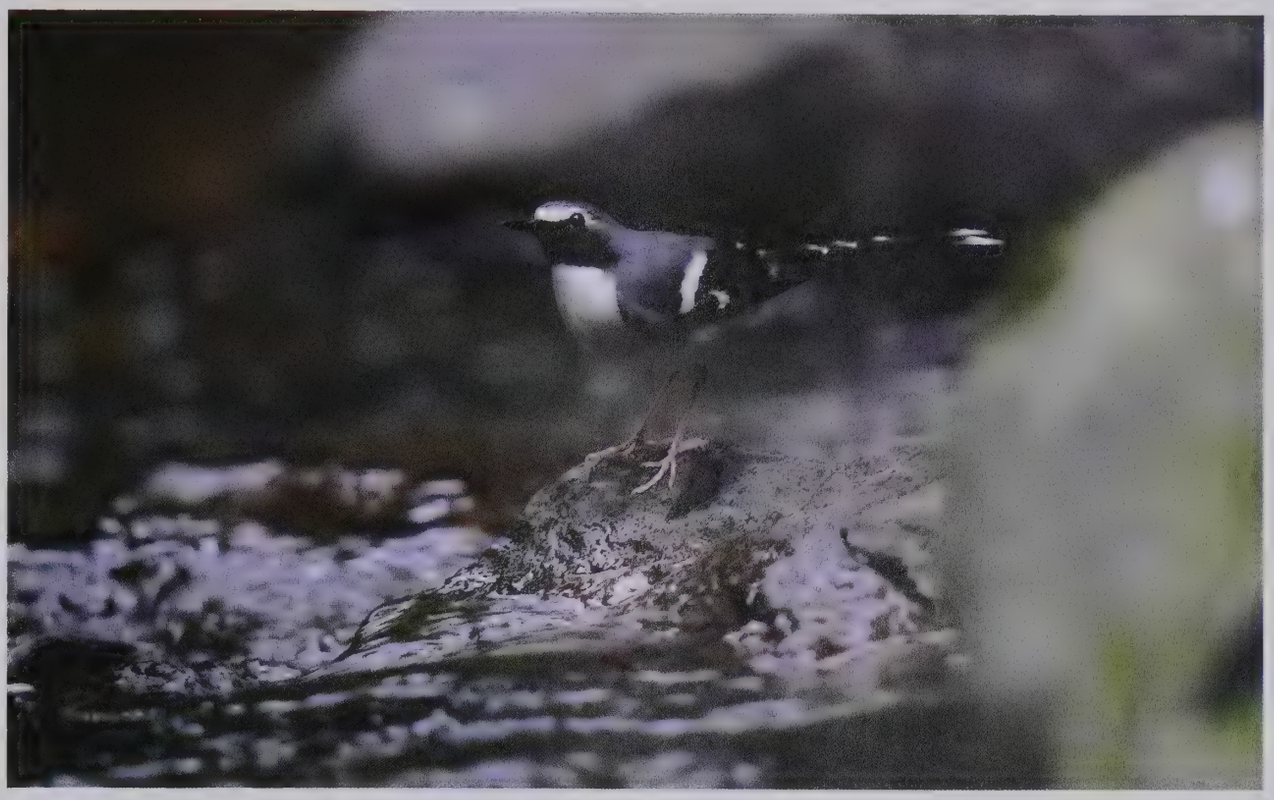




Wheatears are stocky mid-sized terrestrial chats with a slender black bill and stout black legs. Some, like the ***Desert Wheatear****, are predominantly sandy in colour with darker wings or masks, while others, such as the* ***White-crowned Wheatear****, are more dramatically pied, but almost all are characterized by a conspicuous patch of white on the rump and tail-sides; indeed this "white arse" gives rise, in refined form, to their English name. Most of the 21 species of* Oenanthe *live in open, rocky or arid landscapes, and none has much patience with trees. A recurrent theme in the genus is that of polymorphism, wherein different phenotypes regularly interbreed, producing offspring that match one morph or another, rather than intermediate hybrids. In some cases breeding is more or less assortative, and it is difficult to judge whether each particular phenotype is a morph, a subspecies, or indeed an incipient species.*

[Above: *Oenanthe deserti*, Khawr Sawli, Oman. Photo: Hanne & Jens Eriksen.

Below: *Oenanthe leucopyga leucopyga*, Tassili Najer, Djanet, Algeria. Photo: David Vilasís]



The Enicurus *forktails defy comfortable placement in any taxonomic sequence. They have sometimes been grouped with babblers (Timaliidae), or isolated in their own family (Enicuridae), and while they are now generally thought to be thrushes, they are so clearly divergent that they are provisionally allocated to a separate tribe alongside the saxicoline chat radiation, amongst which no obvious relatives can be found. Like all forktails, the* ***Slaty-backed Forktail*** *is a beautiful, elegant bird with a deeply bifurcate tail, strikingly pied plumage and delicate pinkish-white legs. Its life is spent exclusively in the vicinity of noisy streams, where its voice is reduced to a shrill whistle.*

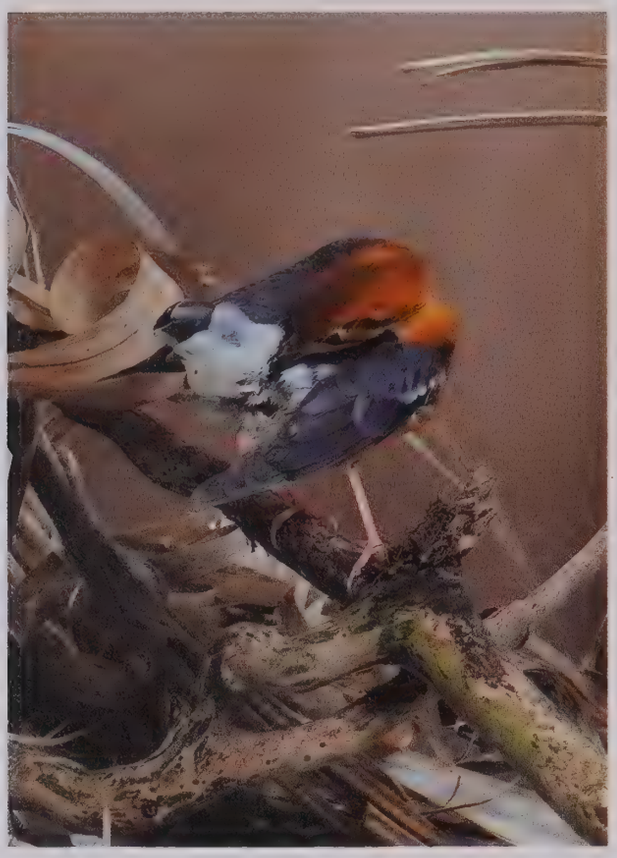
[*Enicurus schistaceus*, Guangdong, China. Photo: John Holmes]

guttatus) wintering in Louisiana establish and maintain territories or wander among occupied territories, but territorial behaviour and the frequency of non-territorial individuals are not governed by age and sex, suggesting the absence in this species of a sex-based or age-based dominance hierarchy.

A critical factor in habitat selection for any species is interspecific competition, which inevitably comes from species that are structurally, and often, therefore, also phylogenetically, closest to the species in question. When migrants arrive on their non-breeding grounds, structurally similar species are most commonly involved as competitors, but thrushes migrating to the Neotropics and chats visiting the Afrotropics obviate this challenge by exploiting locally abundant resources. On both continents they fit into the available habitats, forest in South America and seasonal savanna and dry woodland in Africa, as niche specialists more than as outright competitors. The problem of competition is more acute when the species, whether migrants or residents, are closely related. For example, where Ruddy-capped (*Catharus frantzii*) and Russet Nightingale-thrushes meet, in parts of Mexico, the former is squeezed into dense broadleaf riparian forests in deep canyons, and its bill becomes longer, whereas the latter occupies many kinds of habitat, from open oak (*Quercus*) woodland to dense closed fir–pine–oak (*Abies–Pinus–Quercus*) forest. Where the Ruddy-capped Nightingale-thrush occurs alone, however, it occupies a niche more akin to, and has a bill of the same length as, that of its close congener. In the Old World, in areas where Black and Common Redstarts meet, typically in mosaic urban environments, the former always dominates in aggressive interactions, but it keeps itself to places in which the proportion of trees is less than 26%, leaving areas with higher tree proportions to its rival. Towards 5000 m in the Himalayas, where very few other passerines are to be found, the Black Redstart vies with the Blue-fronted Redstart (*Phoenicurus frontalis*), the former dominating in drier terrain and the latter in wetter localities.

Similar narrow partitioning of habitat occurs wherever there is intrageneric or interspecific competition. It is very apparent among sympatric North American thrushes, ecological separation of which is achieved by a combination of foraging tactics, differential use of micro-habitats, and often altitudinal and even temporal segregation, the last involving differences in timing of breeding. Reports of these distinctions make sometimes dizzying reading, in part because the combinations of species, and the combinations of the solutions that they find, are not fixed. Thus, with regard to the last point, Swainson's Thrush in north-eastern North America reaches its greatest abundance at elevations higher than those for all other turdids except Bicknell's Thrush; in the west, on Vancouver Island, it is, conversely, most abundant at the *lowest* elevations, with, for example, the Hermit Thrush much higher up, while on islands off the coast of Maine, in extreme north-east USA, Swainson's is subordinate to the Hermit Thrush, the latter is subordinate to the Wood Thrush, and the Hermit Thrush and the Veery (*Catharus fuscescens*) are separated by habitat. In the Appalachian Mountains the Hermit Thrush is displaced by the Veery at lower elevations, and in both the Appalachians and the Adirondacks it is displaced by Swainson's Thrush at higher elevations. In Vermont, in north-east USA, sites occupied by Swainson's Thrush have larger, maturer trees than do those in which Bicknell's Thrush is found.

In one study in New York State, Hermit and Wood Thrushes were found to forage primarily on the ground near forest edges, the Veery and Swainson's Thrush low in trees in the forest interior, and Bicknell's Thrush on the ground in the forest interior. In another study, the Hermit Thrush foraged on bark and in the air more frequently, but in the leaf litter less often, than did the Veery or Swainson's and Wood Thrushes; it foraged in foliage more frequently than did the last species, but less often than the Veery and Swainson's Thrush. It spent 46% of its time at 0–0·2 m, 27% at 0·3–2 m and 26% from 2 m up to the canopy, whereas the Veery spent 70% of its time and the Wood Thrush 87% in feeding at 0–0·2 m; the corresponding figures for Swainson's Thrush were similar to those for the Hermit Thrush. In mixed second-growth forest in Wisconsin, the habitats exploited by both the Hermit Thrush and the Veery are similar, but the former forages primarily below 6 m in conifers and the Veery primarily below 3 m in hardwoods. Where these two species and the Wood Thrush meet, the Veery generally chooses the wetter, younger woodlands, with less canopy cover, more shrubs and less leaf litter, while Hermit Thrushes occupy younger forest with denser stands of medium-sized trees and greater canopy cover. Finally, in areas where Swainson's, Hermit and Grey-cheeked Thrushes co-occur in the Alaskan taiga, Swainson's Thrush utilizes the ground layer more than does the Grey-cheeked and the tree-height layer more than the Hermit Thrush, in addition to which it exploits the low and medium shrub layers to a greater extent than does the Varied Thrush.



*The **Orange-headed Thrush** preens its body feathers with rapid head movements, as is the case for all passerines. In similarly conventional style, it grooms the longer feathers of the wings and tail rather differently, pulling them gradually lengthwise through the bill to re-engage loose hooklets, thereby ensuring a smooth, unbroken surface area for efficient flight. While preening, oily secretions are gathered from the uropygial gland, near the base of the tail, and liberally distributed so as to maintain the quality and resilience of feathers.*

[*Zoothera citrina rubecula*, Lake Bratan, Bali. Photo: Tony Tilford]

Responses of closely related species to situations in which habitats become "one-dimensional" or "two-dimensional" reveal how subtle ecological niches can be. In linear, or one-dimensional, habitats such as streams, the community of streamside chats segregates by body size and weight, micro-habitat, foraging behaviour and diet. Along a Nepali river in winter, White-capped Water-redstarts (*Chaimarrornis leucocephalus*), Plumbeous Water-redstarts (*Rhyacornis fuliginosa*) and Little Forktails (*Enicurus scouleri*) largely occupied rocks in the river itself, whereas Spotted (*Enicurus maculatus*), Slaty-backed (*Enicurus schistaceus*) and Black-backed Forktails (*Enicurus immaculatus*) kept mainly to marginal rocks or shoals. When foraging, Plumbeous Water-redstarts used aerial sallying in 75% of feeding actions, compared with 20% for White-capped Water-redstarts, the latter dividing its other feeding actions equally between picking prey from rocks and picking prey from the streamside. The Little Forktail devotes almost 100% of its foraging time to picking from rocks, specializing on the hygropetric (wetted) zone and, therefore, frequenting mainly the vicinity of waterfalls and splashing rapids. The Spotted Forktail focuses mainly on picking items from shoals or mud, which accounts for 60% of its foraging, and otherwise on catching prey in or on the water or on the riverbed. Slaty-backed and Black-backed Forktails spend roughly equal amounts of effort in picking prey from shoals or mud, but the former invests more heavily in catching prey in or on water or on the riverbed, to which it devotes 50% of its effort, whereas the latter picks prey from rocks (30%) and from streamsides (20%). By these adjustments, albeit not without occasional conflicts, in which the White-capped Water-redstart is constantly dominant, this assemblage of saxicoline chats, along with other riverine passerines, forges a tightly fitting ecological community.

It is, however, with the wheatears that the most notable and, perhaps, the most unexpected ecological segregation occurs, and all within a single genus. Very largely treeless, or two-dimensional, semi-desert habitats would scarcely seem fertile ground for an ecological radiation among birds, yet north Africa and the Middle East host no fewer than 18 species of wheatear, most as breeding species and a few as non-breeding visitors. Eleven of them have been recorded in just one country, Iran, where they were the subject of a pioneering but still unpublished ecological study by L. Cornwallis. Cornwallis found that spatial segregation of Iranian wheatears is achieved largely by interspecific differences in altitudinal range, geographical distribution and/or habitat. Minor differences in bill, wing and leg morphology correlate with subtle differences in foraging behaviour and substrate, giving competitive advantages in particular habitats; these are reinforced in some cases by plumage coloration, dun for wheatears of more open country, where hiding places are few, and black and white for those in more broken country, where shadow is usually available. Even so, the overlap between species in morphology and in prey type and size indicates a great potential for habitat elasticity in the absence of competitors. Where different species occur syntopically, spatial separation is achieved by interspecific territoriality, with a hierarchy of dominance. Thus, of the eight common breeders studied by Cornwallis, the Northern and Chest-



*Other aspects of feather maintenance and grooming in thrushes are virtually identical to the comfort behaviour found throughout the vast passerine assemblage, including indirect (or "overwing") head scratching, as illustrated by this **Tractrac Chat**. This species, along with a range of relatives in the semi-arid regions of Africa, is also a keen dust-bather, perhaps because water is so scarce in its favoured habitat. Conversely, dust-bathing either does not occur in typical turdine thrushes, or occurs so rarely that it has never been reported.*

[*Cercomela tractrac*, Namib-Naukluft National Park, Namibia. Photo: Rolf Kunz]

nut-rumped Wheatears co-occur in the montane zone above 2500 m, the former occupying more level terrain and the latter inhabiting sloping, rocky ground. At intermediate elevations five species co-occur; of these five, Finsch's (*Oenanthe finschii*), Isabelline (*Oenanthe isabellina*) and Desert Wheatears (*Oenanthe deserti*) occupy flatter areas, but with the larger Isabelline excluding the Desert Wheatear and confining Finsch's Wheatear to more barren and stonier substrates, while the marginally smaller Mourning and Black-eared Wheatears are limited to more sloping areas. In the rocky gullies at lower elevations, the eighth species, Hume's Wheatear (*Oenanthe albonigra*), appears.

If habitats of wheatears are determined in part by competitive exclusion, habitat occupancy may vary with regional species compositions. In parts of its range, the Hooded Wheatear (*Oenanthe monacha*) occupies the most desolate habitats, and its ecological isolation appears to be related to its tolerance of the highest desert temperatures and to the fact that, being relatively light in weight, it does much of its hunting on the wing, in rocky areas where terrestrial foraging would be highly inefficient. In Israel, however, it inhabits more open and better-vegetated areas than those occupied by the White-crowned Wheatear (*Oenanthe leucopyga*), which prefers rather sheltered but sparsely vegetated rocky and cliff-like areas, while the Mourning Wheatear occurs in more open areas such as mouths of wadis and stony plateaux and hills. The White-crowned Wheatear, however, emerges as the ultimate desert wheatear and, indeed, the ultimate desert bird, being the only one found throughout the year in the most extreme Sahara. It is, for example, the only resident avian species on the Gilf Kebir plateau, in the Libyan Desert.

General Habits

The diversity of thrushes and chats, as observed in their sizes, shapes and coloration, is repeated in their characters. All have the alertness, the bright-eyed vigilance, of the hunter; the more cryptic species, and the larger ones, have the alertness, and the still-bodied silence, of the hunted, while the more colourful species, and the smaller ones, live by their wits and their bravado, their nervous, electric energy visible in their sharp body movements and sudden flights.

On the ground, the smaller turdids mostly hop, but they sometimes walk, too; the larger thrushes either walk or hop, unless needing to move fast. The saxicoline Brown Scrub-robin usually hops but, when venturing out into tracks and clearings at dusk, it runs, taking short steps, with the head, body and tail held in line, and assuming an upright stance only when it stops. Perhaps surprisingly, its close relative the Bearded Scrub-robin, which has interbred with it, has never been recorded as walking or running, but only as hopping. The *Catharus* and *Hylocichla* thrushes are obligate hoppers. Eastern Bluebirds hop and walk sideways, moving with short sidling steps. Flight styles of turdids vary, from the intermittent oaring and deep undulations of the Mistle Thrush to the skilful high-speed twisting and weaving of the robin-chats and to the straight, low whirring flight of the shortwings.

The great majority of the Turdidae are solitary, rather than sociable. The wits by which they live are individual, and not collective. The strongly sociable species are the high-altitude Grandala and the high-latitude *Turdus* thrushes, which forage gregariously outside the breeding season for spatially and temporally patchy food resources; during this season they also roost together, probably for the same reason of unevenly distributed resources, seeking to derive from their neighbours information on the best directions for the following day's foray after food. Some other members of the family form collective roosts or loose foraging groups, but usually for only short periods within a year. Most, however, remain fiercely independent, unwilling even to join mixed-species foraging flocks, although some army-ant followers may give the opposite impression when they gather at a swarm of ants.

Perhaps the most fiercely independent of them all are the wheatears, which are truly remarkable for their powers of endurance. The Northern Wheatear, despite its strangely short-tailed and hence rather unaerodynamic appearance, undertakes the longest habitual over-water flight known for any passerine, intrepidly braving the Atlantic in spring and autumn to reach and, after breeding, to leave Greenland and the New World (see Movements). Many of its congeners populate some of the most arid lands in the world, and by their presence bring a particular grace to seemingly the most unforgiving and hostile of terrain (see Habitat). The secrets of their survival in such adverse circumstances will one day be explained in terms of their physiological attributes, including metabolic rates, air-sac capacity, water retention, and so on, but for the present these birds are simply a source of biological marvel and astonishment.

The key needs for survival are good health, adequate food and effective predator avoidance, and each of these factors has exerted an influence over the evolution of avian habits. Among



Sunbathing has been reported from members of all three turdid subfamilies, and involves the typical procedure of crouching on warm sunlit ground, spreading out one or both wings, fanning the tail, and erecting the contour feathers of the back and rump, as demonstrated by this ***American Robin****. The body is orientated so that the back faces the sun, or it is rolled at a slight angle so that the flank and the sides of the neck are illuminated. Whatever posture is adopted, the behaviour seems to induce a period of heedless rapture during which birds can be approached far more closely than usual.*

[*Turdus migratorius*, Freeville, New York, USA. Photo: Marie Read]

the thrushes and chats, various interesting adaptations have arisen, but there are many avian norms to which the family conforms. Feather maintenance is undertaken in typical passerine fashion, including indirect head-scratching, whereby one leg is brought over the wing. Thrushes and chats are equally enthusiastic water-bathers, and when water is available and secure they may visit it to bathe several times a day. Many African robin-chats have been recorded as "bathing" in dew-laden or rain-laden foliage if no puddles or water-retaining tree holes are at their disposal, and the White-throated Robin-chat has been seen to bathe by flying through a garden spray. At small pools, including birdbaths, some of these species are so aggressive in defence of the resource that they will not allow even their mates access; when individuals water-bathe at places outside their territories, however, they do so without aggression, even though often in close proximity to conspecifics. Preening, the stretching of limbs and the shaking of the body and tail are typically then undertaken on the edge of the pool or on a nearby branch. Preening, involving the use of uropygial secretions, is carried out in the usual fashion, the body feathers being groomed with rapid head movements, and the wing and tail feathers being pulled through the bill in the direction of the feather barbs in order to re-engage loose hooklets.

African robin-chats and scrub-robins also dust-bathe and sand-bathe. Bearded Scrub-robins appear to do so much more frequently than do other robins, perhaps because surface water is rare on the sandy soils that characterize their habitat. At a spot with loose, deep sand, commonly on an open track, the bird may first mould a hollow by making rapid sideways whisks of its beak, or, more often, it will just squat and half-roll on its side, flapping the free wing and rubbing the outstretched head and neck in the sand. Curiously, however, true thrushes appear not to dust-bathe, or to do so only with extreme rarity. Only one published report appears to exist, and its singularity is compounded by the improbability of the species in question: in August 1986, J. del Hoyo, an observer of impeccable credentials, encountered a Green Cochoa dust-bathing by a track in a forest in Thailand. Given that it is usually dry-country species that dust-bathe, that this action took place during a short break in light rain in a rainforest, that it involved a normally highly arboreal rainforest species, and that no other species of true thrush has ever been reported as indulging in such behaviour, the nature of this record speaks for itself.

Sun-bathing, in contrast, has been witnessed for all three subfamilies, and involves the typical procedure of crouching on ground or rock with the back or flank to the sun, spreading one or both wings, fanning the tail, and erecting the contour feathers of the back and rump to expose as large a feather surface as possible. Anting, thought to be a method of inhibiting ectoparasites, is also common to all turdid subfamilies, members of which use both the direct and the indirect methods. The first method involves the application of ants (Hymenoptera) to the body by the bird, and the second the passive exposure of the body to ants. A Wood Thrush was once witnessed to "ant" with a large snail, the shell of which it was hammering on the ground; it thrust and dabbed the snail under its wings, along its flanks and beneath its undertail-coverts. Similarly, captive *Turdus* thrushes of two different Neotropical species were seen to rub, respectively, garlic and red pepper under their wings. The observer, H. Sick, assumed that these substances were next-best substitutes for ants and were being used for the purpose of controlling ectoparasites.

All birds suffer to some degree from disease and infestations, but these are normally held in check by immune responses and routine comfort behaviour. Outward signs of the problem are usually hard to spot, unless death occurs and the body remains somewhere where it can be recovered. Such was the case with some Western Bluebirds (*Sialia mexicana*), afflicted with enteritis, which were found dead in a nestbox in the late 1990s. Swainson's Thrush is a host for foot pox (*Poxvirus avium*), which can result in growths on the feet and at the base of the bill, deformities and foot loss; cases are relatively few and mild, but may be linked with a higher incidence of leg loss in this species compared with others, as recorded in ringing programmes. Owing in part to their abundance and accessibility as study animals, several species of thrush are currently being used in investigations to determine levels and types of disease and infestation in wild populations. "Immunocompetence", measured as the degree to which an individual can defend itself against disease and parasites, is increasingly a subject of behavioural ecology (see Breeding). Of more immediate human interest, however, is the fact that some thrushes, the Common Blackbird and the Brown-headed Thrush (*Turdus chrysolaus*) among them, are thought to be implicated in the spread of Lyme disease, both by carrying the ticks that are the vector and by hosting the pathogen itself, and thus acting as a reservoir from which the disease can spread.



Thrushes and chats are amongst the most ardent aficionados of water-bathing. Many species will flutter on dewy or rain-sodden grass and foliage in order to bathe, and one has been noted flying deliberately through the mist of garden sprinklers. Usually, a more secluded site is favoured, be it a shallow secluded pool, a slow-moving stream, or a puddle retained in the crotch of a tree. Having found an ideal location, this ***Siberian Thrush*** *may visit it daily, or even several times a day, to bathe.*

[*Zoothera sibirica davisoni*, Yamanasi, Japan. Photo: Hirozo Maki]



*Investigators have found that when a **European Robin** is freed after being held captive for anything from a day to several days, its first impulse is not to forage, or to sing, but to bathe. This fact gives some idea of the importance of bathing to thrushes and chats in general. Bathing sites are aggressively defended in some cases, even against mates, but more usually they produce a relaxation of territorial behaviour. Being pugnacious animals, a trio of adult robins is a rare sight in resident populations, but small numbers do sometimes gather at favoured bathing pools, especially when non-breeding or non-territorial birds abound.*

[*Erithacus rubecula*, Sierra de la Paramera, Ávila, Spain. Photo: José Luis Rodríguez]

Comfort behaviour such as preening, dusting and bathing occupy a very small proportion of the daily routine of thrushes and chats. Two far more time-consuming activities, or, rather, inactivities, are loafing and roosting. Loafing, or "quiet wakefulness", refers to the period or periods in the day when a bird remains perched and immobile, resting without sleeping or with only very brief sleeps. For many of the Turdidae, this takes place mainly in one period, over midday, and for some species it can be protracted. The Omao (*Myadestes obscurus*) in Hawaii, for example, spends many hours during the day perched motionless in a tree. Loafing takes its most extreme form, however, in desert-adapted wheatears such as the White-crowned Wheatear, which in the heat of summer retires to the shade at around 08:30 hours and does not resume feeding until 16:30, a span of inactivity lasting for eight hours, and which, even in winter, typically loafs during the six hours between 09:30 and 15:30. Metabolic processes in these species must be greatly slowed, while the energy extraction from their food must be extremely efficient. In fact, Mourning Wheatears have been observed deeply asleep over a period of 1·5 hours in the hottest period of the day, and this may be normal for all desert-adapted members of this genus. Common Stonechats exhibit different resting metabolic rates at different latitudes, these being lowest among residents in Kenya, higher for partial migrants in Ireland, and highest for fully migratory Austrian and Kazakh individuals. These rates prove to be genetically based, and are evidently associated with the relatively slow development and high longevity of birds in tropical and subtropical regions.

Roosting, in the case of the Turdidae, is typically preceded by a period of restless, nervous activity, often with much alarm-calling. The adaptive significance of this strange behaviour pattern is unexplained, although it may be a type of self-advertisement, or possibly even a means of shedding excess calories. It is well established that a diurnal bird must build up its fat reserves towards dusk in order to avoid starvation during the night, when it cannot feed. The storing of fat, however, also imposes burdens such as increased predation risk and higher flight and metabolic costs. All European Robins provided with an *ad libitum* food supply reach almost exactly the same body mass at dusk, thereafter ceasing to forage, indicating that there is, indeed, an optimal level of fat reserves which a bird of this species, and presumably of any other, needs to reach by dusk.

Once in the roost-site, the individual first enters a state of quiet wakefulness, as when loafing. Postures adopted by turdids are rather upright, on a surface that can be gripped strongly in the feet. For the Common Blackbird, at least, eye closure is a reliable indication of sleep. Head postures during sleep are of two types: retraction of the head, with the bill pointing forwards and the head sometimes nodding, and turning of the head so that the bill points backwards into the upperpart plumage, this latter being used only in full darkness. Common Blackbirds sleep for about 38% of a 24-hour period. Roosting lasts from after sunset to before sunrise, typically between points when the light levels are too low for clear human vision, but of course the duration of the roosting period itself is directly influenced by latitude.

The roosting perch is usually in thick cover and fairly low down. Common Blackbirds frequently pass the night in bushes or small trees, often against walls, while Song Thrushes in Finland use the lower parts of thick spruce trees (*Picea*) and, in open parts of Scotland, heather (*Calluna/Erica*). Mistle Thrushes roost in evergreen trees, thick hedges, brambles (*Rubus fruticosus*) and even clumps of mistletoe (Loranthaceae), and Western Bluebirds in America also use mistletoe when not roosting in holes. In Hawaii, four Omaos fitted with radios were tracked to roosting locations about 3–6 m above ground in ohia trees (*Metrosideros collina*), all within the boundaries of their core activity areas. Rock-haunting turdids such as the Blue Rock-thrush and the Variable Wheatear withdraw to sheltered sites in cliffs, sometimes substituting holes under roofs of buildings; in the case of White-crowned Wheatears, pair-members roost separately, and this is probably true for most, if not all, rock-haunting species. Red-backed Scrub-robins (*Erythropygia leucophrys*) normally choose a perch 1·5–2 m above ground in thorny branches, Pied Bushchats and their fledglings in New Guinea roost in tall cane-grass about 2 m in height, and certain other species will make use of reedbeds for night-time shelter. Some hole-nesting wheatears and their closest relatives presumably also use mammal burrows for roosting. The Southern Anteater-chat (*Myrmecocichla formicivora*), a co-operative-breeder, does so throughout the year, each group, of up to five individuals, using as many as ten burrows on its territory for the purpose.

During the breeding season, pair-members other than those of rock-haunting species will often roost together, or fairly close to each other. In Costa Rica, for instance, A. F. Skutch found a



After bathing, thrushes usually retreat to a nearby perch where they dry themselves by fluffing out the feathers, fluttering the wings, shaking the body and preening. The bird pictured here is a ***Groundscraper Thrush****, a boldly speckled resident of southern African woodlands and gardens. According to biomolecular studies it is very close to* Turdus*, but just divergent enough to justify continued separation in a monotypic genus.*

[*Psophocichla litsitsirupa litsitsirupa*, Nylsvley, Limpopo, South Africa. Photo: Warwick Tarboton]

mated pair of Clay-coloured Thrushes, at the start of the breeding season, roosting in a small orange tree in a coffee plantation. The two were perched about 1 m apart on slender, rather exposed branches 2 m and 2·8 m, respectively, above the ground.

Outside the breeding season, some members of the family roost communally. Such behaviour, being more obvious to human eyes, has been relatively widely reported, but is not yet known to be widely practised. Most reports concern true thrushes in the higher latitudes. Nevertheless, there is at least some evidence that the phenomenon occurs among other taxa and/or in other regions. For example, up to twenty or so bluebirds will pack into tree holes at night as a means of conserving body heat, and Pale-breasted Thrushes (*Turdus leucomelas*) have been watched as they gathered at dusk and disappeared one by one into a densely leafed tree in a street in Paramaribo, Suriname. Clay-coloured Thrushes have been seen to roost together in small groups in tall bamboo clumps in Costa Rica, and, in Mexico, thirty or so went to roost in a forest in Veracruz, making so much non-vocal noise that "the bushes… resounded with a dull roar", each new arrival startling the entire flock, causing each individual to fly, with much fluttering, to another low perch. Non-territorial, thus mainly first-year, European Robins roost communally in the period July–February, possibly chiefly as a mechanism enabling the individuals involved to assess the local population density; it is speculated that, by judging the number of other non-territorial robins in the area, they are better able to decide whether, in the quest for a territory, they should disperse or stay put. Even male Sri Lanka Whistling-thrushes (*Myophonus blighi*), from a genus that is typically highly solitary, have been observed to form roosts of up to four individuals at points where their territories adjoin.

It is, however, the turdine thrushes breeding at higher latitudes that produce the largest roosts, and among these species the phenomenon may be commoner than is generally observed or believed. In July of each year, more than 10,000 wintering Creamy-bellied Thrushes (*Turdus amaurochalinus*) form a roost in the bamboo understorey of *terra firme* forest in Noel Kempff Mercado National Park, Bolivia. American Robins habitually form large roosts outside the breeding season, and they roost in groups even in the spring and summer months. These roosts are attended by individuals of both sexes and all ages during the winter, by adult males during the breeding season, by adult females once nesting is completed, and by them and their offspring as soon as the latter reach independence. This pattern is followed in some areas by Common Blackbirds. Communal American Robin roosts typically comprise 20–200 individuals, but some have been estimated to hold as many as 250,000. Roosts in New Jersey in the period June–November are made up of individuals that generally forage within a 3-km radius of the site, and, although these sometimes switch roosts, they rarely move farther than 2 km from the previous roost-site. Communal winter roosting is probably used by this species not for thermoregulation, but for the exchange of information on foraging sites and for anti-predator security.

The same is true of the Fieldfare in the Old World. At any time from July to April, this thrush forms large roosts in conifers,



Given that tails are so strikingly patterned in many species of chat, it comes as no surprise that they are regularly flaunted. By cocking them, shivering them, pumping them downwards or flirting them open, chats employ their tails in various simple displays, probably as a form of self-advertisement. This ***White-tailed Rubythroat****, captured in stunning pose, with eye-catching rectrices raised and fanned, leaves little doubt as to the value of a prominent tail-pattern as an instantly controllable, species-specific, long-distance visual signal.*

[*Luscinia pectoralis ballioni*, Almatyskoje, Tien Shan mountains, Kazakhstan. Photo: Lionel Maumary]



The use of wings in visual signalling systems seems much less important than that of tails in thrushes and chats. A good number of species, however, particularly within the saxicoline clade, flick their wings habitually, sometimes revealing patches of white. Others flash their wings outward momentarily when foraging, or after landing on exposed perches, as demonstrated by this ***Chestnut-rumped Wheatear****. These modest displays using wings and tails are probably analogous in function, serving to draw attention towards the bird, or away from a nest.*

[*Oenanthe xanthoprymna*, Yesilce, near Gaziantep, Turkey. Photo: Robin Chittenden]

preferably young plantations, in deciduous woodland with a dense understorey, in tall hedgerows, osier (*Salix*) stands and reedbeds and, in some areas, on the ground in open fields. In 1788, in his famed book *The Natural History of Selborne*, Gilbert White recorded that, in the gathering dusk, Fieldfares flew in to settle for the night on the ground on his local heath in Hampshire, in southern England. Fieldfare roosts are generally modest in size, with individuals numbering in the hundreds, but they occasionally reach tens of thousands and, in January 1975, some 200,000 were recorded as roosting with Common Blackbirds at a site in France. As the flying birds reach the roost-site, in small flocks, they plummet sharply down into it. The time of arrival is probably determined by several factors, including the time of year, foraging success and/or distance travelled. The shorter the day, the longer the birds need to forage, and early arrival indicates high foraging success. Dusky Thrushes in Japan indicate their intentions to move to the roost by sitting in trees and calling for 5–30 minutes, before setting off for the site; groups tend to arrive 50–60 minutes before sunset, whereas lone individuals arrive 10–20 minutes before sunset. Fieldfares roosting in woods often work their way down the trees, finally selecting a perch a metre or two off the ground; they are not known ever to huddle together as smaller-bodied birds sometimes do, but always leave a certain individual distance to their nearest neighbour. In the morning, as with most birds, they are commonly out long before daybreak, with a general clamour as they disperse towards their destinations for the day.

Immediately before or after roosting, many forest and woodland species make use of deep twilight in order to forage quietly on the ground in slightly more open areas than those exploited during the daytime. Indeed, some of the most reclusive species, such as the *Zoothera* thrushes and some scrub-robins, are likely to be seen only before sunrise or after sunset, although they may then appear to be fairly common; yet in daylight hours it can be difficult to credit that the species are present at all in the local environment. Ground-foraging forest-dwelling thrushes and chats tend to have large dark eyes, and the twilight activity of various invertebrates on the forest floor means that many turdids, as, for example, the Rufous-capped Robin-chat, emerge from cover after sunset to forage in clearings and along narrow roads, and are often still active when most other diurnal birds have already retired to roost. It is difficult to know the extent to which such behaviour involves predator avoidance, rather than niche exploitation.

Many forest-inhabiting chats and thrushes are among the world's supreme avian skulkers. In Asia, the Indian Blue Robin is, according to the widespread frequency with which its song is heard, an extremely common bird in the Himalayas, but it is very seldom seen, as it perches openly to sing only in the few days before nesting commences. Likewise, in Africa, the Blue-shouldered Robin-chat (*Cossypha cyanocampter*) can scarcely be seen even in twilight, and it sings in complete darkness. J. P. Chapin found the Forest Scrub-robin (*Erythropygia leucosticta*) extraordinarily shy and, even when singing, "more than elusive—almost ghostly". Similarly, every birdwatcher in Europe knows how difficult it can sometimes be to catch sight of a Common Nightingale or Thrush Nightingale even while it is singing, and how impossible the task becomes after the middle of June, when singing ceases.

On the other hand, many of the Turdidae have distinctive and obvious body movements that are used both intraspecifically and interspecifically to signal the individual's presence and to declare its intentions. These are as much signatures as they are signals, and are fundamental components of the all-year display repertoires of the family, and, indeed, of all three of its subfamilies. They are part of the behaviour of even some of the most reclusive species, such as the Common Scaly Thrush, with its curious shivering and bobbing. Common and Black Redstarts sporadically shiver or flicker the tail, most frequently after alighting. Güldenstädt's (*Phoenicurus erythrogastrus*) and Blue-capped Redstarts also do so, but less often, the latter, at least, compensating by frequently flicking its wings, exposing the rump, and, when feeding on the ground, by raising and lowering its tail slowly in the manner of some *Tarsiger* chats. Eversmann's Redstart not only shivers its tail but also flirts and flicks it, and the Plumbeous Water-redstart, whenever it lands, dips and flirts its tail in a rapid scissors-motion that makes a prominent visual signal. Both the Siberian Blue Robin and the Rufous-tailed Robin in the genus *Luscinia* shiver the tail. Somewhat unexpectedly, perhaps, the habit re-emerges in certain Neotropical turdine thrushes. In central South America, the tail-quivering of the Creamy-bellied Thrush as it perches at once distinguishes it, even at a distance, from the Pale-breasted Thrush, and the Rufous-bellied, Cocoa



Thrushes and chats are famed for the strength and versatility of their songs, some of which are listless or repetitive, and others are simply magnificent. Amongst the acoustic signals of all birds, and indeed all living creatures, theirs perhaps most closely approach (and some say surpass) the human aesthetic we call music. Being oscines, they learn their songs and their repertoires are often impressive. Many, including the ***Siberian Rubythroat****, amass or bolster these vocabularies by imitating other species of birds: the most accomplished and prolific avian mimic is not a mockingbird (Mimidae), or a lyrebird (Menuridae), but a thrush.*

[*Luscinia calliope*, near Nome, Alaska, USA. Photo: Arthur Morris/ VIREO]

and Black-billed Thrushes (*Turdus ignobilis*) also dip or quiver the tail on alighting.

More exaggerated tail movements are common throughout the family. When landing on or above the ground, many species in the genera *Turdus*, *Catharus*, *Copsychus* and *Erythropygia*, as well as the Black Scrub-robin, cock the tail high over the back and lower it slowly, often with slight flicks and drooping of the wings. These gestures grow more pronounced as the birds become more proprietorial in the breeding season, but they are demonstrated throughout the year. The Brown-backed Scrub-robin (*Erythropygia hartlaubi*), for example, moves the tail so incessantly that it continues to do so even while preening. Whistling-thrushes make deliberate gestures whenever they alight, first raising the tail and then depressing and fanning it several times. Some of the rock-thrushes, including the Chestnut-bellied (*Monticola rufiventris*) and Blue-capped Rock-thrushes, have a habit of pumping the tail slowly up and down, and males also fan it. Similarly, the Indian Blue Robin waves its tail up and down rather slowly, like a pitta (*Pitta*), when perched, and its near-namesake the Indian Robin does likewise when on the ground, frequently raising the tail vertically or even farther forward to expose the chestnut undertail-coverts. *Myrmecocichla* chats constantly wag the tail upwards and downwards, holding it fanned when up and closed when down, and, when the individual is excited, these movements cause the tail to travel through a 180-degree arc. Wheatears typically bob the head and flirt the tail in a single movement. *Enicurus* species, the forktails, not only repeatedly wag the tail up and down but also simultaneously open and shut it scissorswise, in an action identical to that of the *Rhyacornis* water-redstarts. They perform this signal in bouts, with 2–5 such actions in a sequence, the visual effect being enhanced by the flashing-open of the wings at the carpal, thereby exposing the white in the wings.

Wing-flicking movements are probably no less widespread than are tail movements. Many of the above-mentioned species and genera also use wing-flicking actions of some kind, even if these are less conspicuous or less emphatic than the tail movements. Some taxa, however, make wing movements that are stronger than the tail movements. The Hawaiian *Myadestes* species have a habit of wing-fluttering when perched, the bird drooping the wings slightly and shivering the primaries lightly or vigorously. The function of this behaviour, which has not been documented for other myadestine thrushes, is as yet unexplained, but it is exhibited as much by recently fledged individuals as by adults, and as much by calm birds as by stressed ones. Similar behaviour by the Varied Thrush appears to be a submissive display. Common Stonechats flick their wings most frequently on alighting, drawing attention to themselves through the flashing of the white wing-coverts, this suggesting a strong element of self-advertisement. *Cercomela* chats, when alighting, flick open their wings several times, the movement involving mainly just the primaries, but with the tail also partly fanned, and the Familiar Chat and the Blackstart (*Cercomela melanura*) do so at every stop after hopping a distance across the ground. These rather deliberate, measured wing-flicks or wing-flashing actions, which



The song of the ***White-throated Robin*** *is a sustained and vigorous outpouring, including warbles, fluty whistles and scratchy chattering notes. Morphologically, the species bears a striking resemblance to certain robin-chats* (Cossypha)*, but its black tail and migratory behaviour suggest that its origins lie elsewhere. Where, exactly, remains a mystery, but it is probably most closely allied to the robins and nightingales in the genus* Luscinia*. Like them, it is known to vocalize strongly in its winter quarters, at least from January onwards, and it may use song to defend two territories each year, one in Asia Minor, and another in Africa.*

[*Irania gutturalis*, Lesbos, Greece. Photo: Richard Brooks]



In many turdids the sexes are dichromatic, and females are silent, but this generalization does not apply to a large subset of chats and solitaires in which the sexes are alike and females sing. One such species is the ***Southern Anteater-chat****, a dull-coloured denizen of southern African savannas. Its song is a series of snippets sustained for prolonged periods, each phrase a medley of strong fluty whistles and sharper chirps. The male is usually responsible for this, but the female sometimes produces the same refrain, especially when excited.*

[*Myrmecocichla formicivora*, Nieuwoudtville, Northern Province, South Africa. Photo: Peter Steyn/Ardea]



As with many other species of open landscapes, such as pipits (Motacillidae) and larks (Alaudidae), some turdids have adopted the technique of song-flighting. This practice seems absent in true thrushes, but prevalent in myadestine solitaires and saxicoline chats. Open-country wheatears, for example, address the lack of vantage points from which to project their songs by launching themselves into the air. In the ***Isabelline Wheatear*** *the song begins with an accelerating series of downslurred notes during the ascent phase and shifts abruptly, as soon as the descent begins, into a manic jumble of crackling, buzzing and twanging.*

[*Oenanthe isabellina*, Lesbos, Greece. Photo: Richard Brooks/ FLPA]

are also made by certain desert-adapted wheatears, have been thought to help in the locating of invertebrate prey, by causing the latter to react with sharp movements of their own.

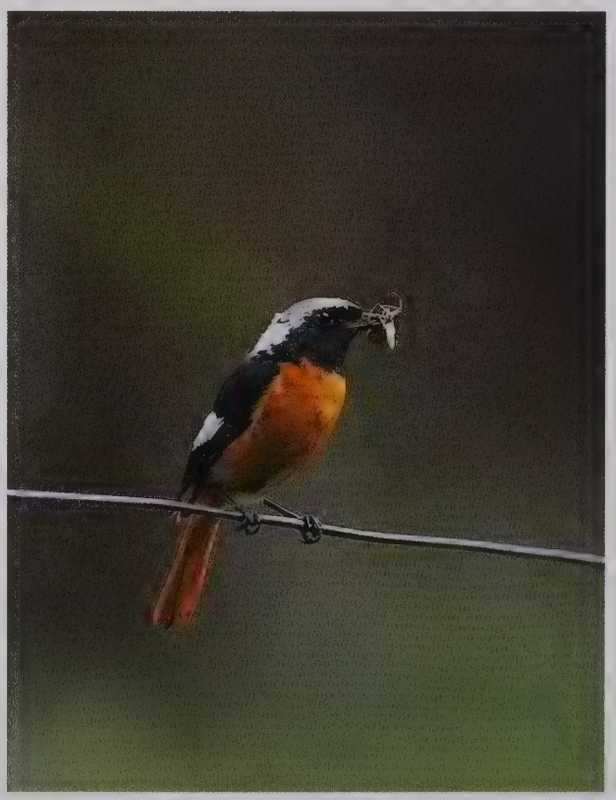
Several species of ant-following chat, including those in the genera *Stiphrornis*, *Sheppardia*, *Alethe* and *Pseudalethe*, make agitated wing-flicking and tail-flicking movements when working an ant column, and react with similar movements to imitations of their calls. This suggests that, for these species, the behaviour is associated more with aggression and self-advertisement than with foraging itself. Similarly, Fieldfares and Mistle Thrushes, when guarding a fruit resource, perch conspicuously on or next to the food plant and, at the approach of a potential rival, loosen and slightly lower their wings so as to reveal the white underwing-coverts as a warning of impending attack.

Although self-advertising wing and tail movements appear essentially involuntary, they are much more obvious when the bird is mature and confident of itself and of its ground. A fascinating piece of observation by R. Leverton, studying migrant Ring Ouzels at a stopover site, demonstrated the importance of familiarity with a particular terrain. Newly arrived Ring Ouzels were always "visibly unsure and naïve"; when he flushed them, their flight was aimless and erratic. By the end of the third day, however, those individuals that had stayed had learnt the geography of the area within a radius of 1 km, and they had established an alternative feeding ground up to 700 m away from their preferred site; whenever danger arose, they would make off, low, silently and accurately, to this alternative foraging area. They had also selected a roost-site and several loafing sites, and knew the position of a small concealed dewpond at which to drink and bathe.

This anecdote explains perfectly why so many species of thrush and chat are site-faithful. In Africa, for example, a given pair of Blue-shouldered Robin-chats may almost invariably be found in its own particular part of the forest. Ringed individuals from a population of Rufous-capped Robin-chats at Kagoro, in Nigeria, were found to be still in exactly the same place more than eight years later, and a Brown-chested Alethe (*Pseudalethe poliocephala*) was controlled just 100 m from where it had been ringed nine years earlier. Similarly, in Panama, a Clay-coloured Thrush ringed in 1964 in the Canal Zone was found dying ten years later less than 1 km from the initial site of capture. The whistling-thrushes of Asia are among the most predictable of thrushes and chats in terms of both routine and site usage. The fixed routine means that they are generally hard to find at any time other than dawn and dusk, but the habitual site usage means that they are almost certain to be present at particular spots at those hours of the day.

Migrant species are no different. For example, adult Whinchats (*Saxicola rubetra*), particularly males, return from their African winter quarters to the territories that they previously occupied in Europe, and the Blue Rock-thrush keeps to the same neighbourhood day after day, even in successive seasons. In China, a first-year male Bluethroat ringed in November 1991 at Mai Po, in Hong Kong, was retrapped there in the springs of 1992, 1993 and 1995, while a male Orange-headed Thrush (*Zoothera citrina*), reasonably assumed to be the same individual, was present for seven successive winters at the bottom of the access road to the Tai Po Kau Nature Reserve. In the New World, Townsend's Solitaires return to defend the same set of trees each year on their non-breeding grounds, and, on the basis of limited data, Varied Thrushes are strongly site-faithful in winter and appear to be so also when breeding. Philopatry among Eastern Bluebirds seems to be partly a function of breeding success: pairs that failed to breed in one year were less likely than were successful breeders to return to the same area in the following year.

Various studies of turdine thrushes in America have produced some interesting results. In a colour-marked population of Swainson's Thrushes in the Pacific Northwest, 42% of males and 31% of females returned to the previous year's breeding site. Similarly, corresponding figures of 59% and 45% for, respectively, male and female Wood Thrushes demonstrate that the former are more prone than are females to return to the previous year's breeding site and, especially, to the same territory; in addition, mean distance between captures in sequential winters of only 43–62 m in Costa Rica reveal high winter philopatry, too, for this species. In the case of Bicknell's Thrush, mist-net recaptures at the same sites over successive years show that older males, as well as females of all ages, are site-faithful on their breeding grounds, and winter philopatry has also been documented on the wintering grounds in Hispaniola; in the Dominican Republic, 14 out of 27 marked individuals were recaptured in successive winters, the distance between capture sites in the two seasons ranging from zero to 260 m, with a mean of 95·4 m. In contrast, only 18% of 306 Hermit Thrushes returned to the same locality in California in successive winters, and, of 81 individuals of this species ringed in South Carolina, only ten returned there in the following winter. In Mexico, however, many individual Hermit Thrushes were repeatedly captured in the same mist-nets, at the same location in Tamaulipas, during December to March over a three-year period.



For most turdid taxa insects form the bulk of the diet, at least during the breeding season, and the most insectivorous species are found within the saxicoline chats. This is partly because their bills are relatively slender, designed for surface and aerial foraging rather than digging or fruit consumption. Like most of its relatives, the ***Daurian Redstart*** *is therefore particularly at home gleaning invertebrate prey, such as spiders and caterpillars. Even so, somewhere between a fifth and a third of its dietary intake consists of plant material, mostly seeds and berries, and this type of "mixed economy", biased towards insects, is widespread in the family.*

[*Phoenicurus auroreus auroreus*, south Ussuriland, Russian Far East. Photo: Yuri Shibnev]

Although site-fidelity and territoriality are not the same thing, it is a very short step from the first to the second. If a solitary bird returns to or stays within precisely the same area because the resulting high degree of familiarity confers elevated survival chances upon that individual, it follows that the area that it occupies will be only as large as its needs dictate, and it will be the fittest bird of its species in that area. Consequently, it will always be likely to win if any confrontation arises over the resources that it exploits, and this will perpetuate its presence there over a longer term. J. A. Tobias, in his studies of European Robins, has shown how such familiarity, which is a "value asymmetry", has precisely this effect. The reason why residents almost always win against challengers is the inequalities in physical condition between the two: residents have maximal foraging efficiency owing to minimal levels of boundary disputes with known neighbours, and to their greater familiarity with the distribution of resources within their own territories. The time at which dominance tends to reverse in favour of new holders, 5–6 days in winter, is predicted by the time that it takes for them to settle territory boundaries and achieve baseline foraging effort. D. W. Snow noticed that older male Common Blackbirds might tolerate the intrusion of known neighbours in certain contexts, as when feeding on fallen fruit, but would single out and drive off a new trespasser which might be likely to attempt to use the opportunity to establish himself permanently there. It has been demonstrated that, unsurprisingly, overwintering resident Wood Thrushes experience a lower mortality rate than that of wanderers.

In Africa, certain *Cossypha* robin-chats are notoriously aggressive in defence of their all-year territories. In intraspecific territorial display, a singing male will crouch, holding the head low, the back sloping almost vertically up and the tail fully fanned, and then chase his rival while giving much bill-snapping, the two sometimes grappling in mid-air and falling to the ground with claws interlocked. The targets, however, are not just conspecifics. Robin-chats will pick on almost any bird of vaguely comparable size, especially in autumn after completion of the post-breeding moult, or when young are in the nest. Even shrikes, which are well known for their own intrepid aggression towards other, often much larger species, are pursued. A male White-browed Robin-chat was once seen to pounce on a Black-headed Gonolek (*Laniarius erythrogaster*) and viciously peck it. A Cape Robin-chat did likewise with a Yellow-tufted Malachite Sunbird (*Nectarinia famosa*). Many wheatears are similarly merciless. Finsch's Wheatears fight each other very fiercely in winter, and a Buff-breasted Wheatear was once seen to pursue and pin down with its feet a slightly larger Mourning Wheatear and to peck fiercely at the latter's head for half a minute, until the victim escaped. By the same token, investment in territorial display by these species, through song and, in the case of wheatears, song flight, can be surprisingly heavy. The display of the Rusty-tailed Wheatear is often very obvious, the male energetically fanning his tail and executing short pirouettes into the air, singing all the while. It can also be very prolonged: one individual of this species, in September, was seen to continue this display for almost 50 minutes.

In the tropics and subtropics, permanent territories may be defended jointly by the members of a pair. With the Karoo Scrub-robin (*Erythropygia coryphaeus*), for example, pair-members forage independently for a while, and then one will fly on to a bush, call and be joined by its mate; the two then greet each other in a very upright stance, calling and flicking out both wings horizontally two or three times. In the breeding season, there are many other types of vocalization and display, especially when conspecifics from adjacent territories are involved. In one display, the scrub-robin flails its wings with a peculiar slow rowing action; this is often taken up by its mate, and then by other pairs on conspicuous perches in adjacent territories. In contrast, species in temperate climates, and migratory ones, occupy solitary territories, and, for most turdids studied, both the male and the female then sing in defending their own patches. Only for the Common Stonechat have joint non-breeding territories been observed as typical behaviour, but these unions are unstable within the winter period and the majority dissolve in the spring.

Aggressive postures depend on which part of the body the bird needs to emphasize. European Robins, and other species with bright breast coloration, adopt a posture that emphasizes the extent of the colours. In an aggressive interaction with another male, a male Pied Bushchat sings while holding its tail depressed, its neck craned forwards, its white rump fluffed out, and the wings drooped to expose the white "shoulder" patches to a maximum. By way of contrast, the male Indian Robin, in asserting territorial rights against a rival, adopts a remarkable attitude: he stretches his neck, pointing the bill vertically up, everts the breast feathers, the white wing-coverts and the chestnut undertail-coverts, and cocks the tail until it touches the back of his head, all the while running about and pouring out a flood of squeaky song. Other turdid species likewise flaunt the tail in



Several chat genera rely on two main foraging techniques: the "perch-and-pounce" method, involving sit-and-wait tactics on a low perch, followed by a darting flight to the ground or nearby branch; and the "leap-and-snatch" method, involving a brief sally or jump to take flying insects. These modes of capture underlie the proliferation of Phoenicurus *redstarts,* Saxicola *bushchats,* Oenanthe *wheatears and* Cercomela *chats, including the* ***Familiar Chat****. The success of this species is further ensured by its ability to forage on seeds, berries, household scraps and pieces of roadkill.*

[*Cercomela familiaris actuosa*, Giants Castle, Drakensberg, South Africa. Photo: HPH Photography/ Photo Access]



The most successful of all chats in terms of overall abundance, geographical spread and subspecific diversification is the ***Common Stonechat****. This species mainly hunts from an exposed perch, usually situated low above the ground. It employs the typical "perch-and-pounce" method, flying down to take prey on the ground, alighting momentarily, then often returning to the same perch. In one study 80% of all foraging strikes involved this process, with a lesser investment in three alternative techniques, including aerial sallying (9%), hover-gleaning to branches or foliage (6%), and fluttering over some distance in pursuit of aerial prey (5%). The incidence of these tactics varies regionally and seasonally. In common with most chats the bulk of prey items are invertebrates, including spiders, earthworms and many insects. This last subset is rather diverse, ranging from relatively immobile beetles (Coleoptera) and caterpillars (Lepidoptera), to highly manoeuvrable hoverflies (Syrphidae) and dragonflies (Odonata).*

[*Saxicola torquatus*, Audierne Bay, Brittany, France. Photo: Jean-Louis Le Moigne/Bios]



*The **Western Bluebird** seems distantly related to true thrushes (Turdinae), and is provisionally classified alongside the solitaires (Myadestinae), but its foraging tactics and favoured prey are similar to those of chats (Saxicolinae). In spring and summer it hunts from a low perch, usually dropping to the ground to capture a range of invertebrates, in this case an orthopteran. During these seasons the diet is almost wholly made up of insects, but in the autumn and winter the bluebird switches to an intake of berries and other plant matter.*

[*Sialia mexicana occidentalis*, near Fresno, California, USA. Photo: Barbara Gerlach/ DRK]

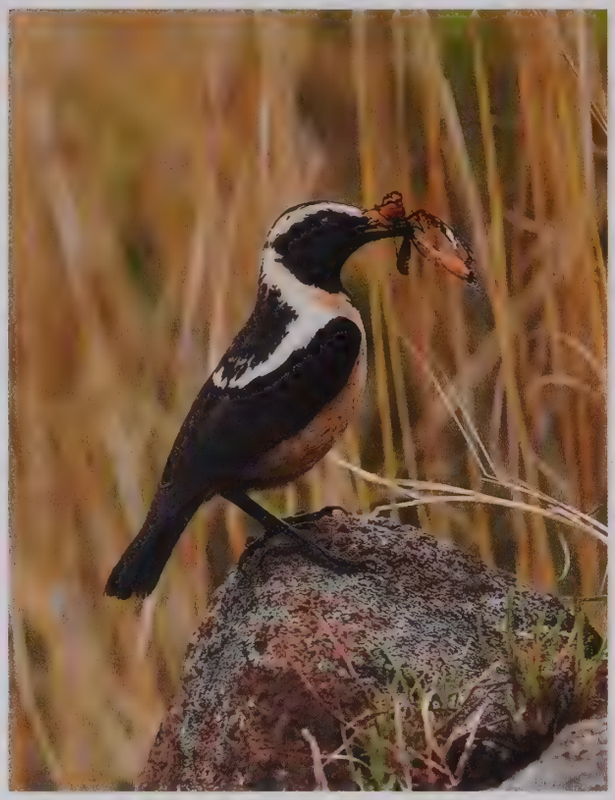
territorial disputes. Male White-crowned Forktails (*Enicurus leschenaulti*) threaten each other at territorial boundaries on streams by erecting all of the body feathers, looking then like a powderpuff, and holding the tail vertically; the white feathers of the forehead may also be lifted and manoeuvred. In aggressive display towards conspecific Cape Robin-chats, the territory-holder faces his rival and slowly raises a fully fanned tail while singing loudly. Chasing may ensue, often with the holder's mate involved. Skirmishes with persistent trespassers may continue through the day. Among African robins generally, territorial disputes are common and can lead to breast-to-breast fighting. With Chorister Robin-chats (*Cossypha dichroa*), however, territorial rivalry may be suspended during the brood-feeding period, as two pairs were seen to intermingle while foraging near the common boundary of their adjoining territories.

Signalling behaviour of the Hermit Thrush involves at least 14 different displays. These are gaping, resembling a ritualized intention to bite; bill-snapping; crest-raising; the "spread" display, with puffing-up of the feathers; wing-flicking; tail-flicking; foot-quivering, whereby a rattling sound is produced as the feet are alternately vibrated in the leaf litter; the upward stretch; the horizontal stretch; the "withdrawn" posture, with the head between the shoulders and shivering of the wings away from the body; the freezing crouch; wing-flashing; tail-raising; and a noisy flight termed "winnowing". Most of these appear to be associated with direct aggression, exceptions being foot-quivering and tail-raising, which indicate attack/escape ambivalence, "withdrawn", which conveys submission, wing-flashing, which precedes retreat, and the freezing crouch, which is used in response to an aerial predator. Similar repertoires exist for other turdid species, but they have not been detailed.

Threat displays of the Eastern Bluebird include "facing", "gaping", and "wing-flicking", and this species' appeasement displays include "turning-away" and "fluffed posture". In turning-away, the bluebird fluffs out its feathers and then turns its head away from its opponent, this being performed also by an individual towards its mate. In fluffed posture, it retracts the head and fluffs the feathers. Of the threat displays, facing involves the turning of the head to face the opponent, usually when individual distance has been violated. Gaping is similar, except that the bill is held open; at high intensity, the head feathers are sleeked and the bird leans towards its rival. In wing-flicking, which is always directed at a conspecific, the bluebird perches in an oblique position and, with warbling and chattering notes as accompaniment, flicks both wings rapidly out to a plane level with the body; it may also fan its tail. In a "wings-out display", which is always directed against a non-conspecific, it faces its opponent, with legs fully flexed, body horizontal, plumage sleeked, and wings held horizontally to the side, and usually follows this with an alarm scream and an aerial attack. A "head-forward display", often preceding a supplanting attack on a conspecific, is given when facing an opponent, during which the body is kept horizontal, the head retracted, the tail slightly lowered and the body sleeked. In "oblique bill-up display", the body and tail are held at an angle to the head; in "horizontal bill-up display", the legs are extended, the neck stretched, and the head and bill pointed upwards, so that the black chin stripes possessed by both sexes are exposed to the opponent's view.

Territorial defence by Townsend's Solitaire, which is territorial in both summer and winter quarters, involves posturing, and supplanting actions with the aim of landing on a perched intruder, thereby forcing it to move, as well as chases and grappling. In stand-offs, the territory-holder gives a "puff display" by erecting the body plumage and pulling in the head and neck so as to assume a partially spherical shape, sometimes squinting to accentuate the white eyering; it is interesting that this is considered an appeasement display when performed by bluebirds. Chases can be no more than a mild escorting, in which the territory-holder flies up to join and briefly accompany a passing aerial intruder, but at higher levels of aggression the solitaire flies fast and directly at an intruder, which either retreats or becomes involved in a complex high-speed twisting, turning race through the undergrowth, around the territory. Grappling is full physical confrontation in which, from adjacent perches on the ground or in trees, two opponents launch at each other and spiral upwards, interlocking their feet, flailing and pecking, and sometimes tumbling to the ground to fight, often resulting in visible injury to one party.

The sizes of winter territories occupied by Townsend's Solitaire vary considerably, from as small as 0·01 ha and with as few as two juniper trees (*Juniperus*), but presumably large and productive ones, to relatively large, more than 5 ha in extent, and containing several hundred junipers, presumably small and less productive ones. Territory size is negatively correlated with the



*The **Buff-streaked Chat** spends much time on the ground, bounding from stones to pick up seeds and small insects. Equally often it forages from the top of a boulder or bush, whence most foraging manoeuvres (70%) involve a sally after flying prey, such as this lepidopteran. Sallies to the ground or to vegetation occur much less often. Morphologically, it looks like a cross between a stonechat and a wheatear, but partly on account of its foraging tactics it seems to deserve placement in a monotypic genus, perhaps a stepping-stone between the twin assemblages of* Oenanthe *and* Saxicola.

[*Campicoloides bifasciatus*, Wakkerstroom, Mpumalanga, South Africa. Photo: Warwick Tarboton]

density of juniper berries, and is affected by the number of competing solitaires. As with the European Robin, boundaries between territories are sharply defined, with little or no overlap; and, indeed, the European Robin shows the same proclivity for defending very small areas, as little as 0·04 ha, if these are sufficient to satisfy its needs. Similarly, American Robins and Mistle Thrushes may establish tiny winter territories to defend fruit resources, such as a single fruiting crab apple (*Malus sylvestris*). Defensive attacks by European Robins on intruders are more numerous in November–January than they are in February–March, and they are more pronounced, first, against conspecifics, second, in and just after cold weather and, third, when the number of intruders is lower. In this last context, too many intruders make the costs of defence too high.

Despite the strong evidence that winter territorialism among thrushes and robins is directly related to the defence of a food resource, a study of European Robins wintering in Spain revealed that the body condition of "floaters", individuals without territories, was no different from that of territory-holders. It suggested that, instead, the real benefit to territory-holders lies in concealment from predators, because, compared with floaters, they spend a higher percentage of time hidden and are able to forage in areas closer to cover. Moreover, separate work has shown that European Robins are slower to see, and hence to react to, potential predators in the neighbourhood when they fight than when they merely use threat display. The risk of predation, alongside the risk of injury or worse during fighting itself, may, therefore, be an additional disincentive to enagage in physical combat. Whether territory-holders have fewer or more fights than do floaters has not, apparently, been established, but it would seem to depend on the extent to which floaters attempt to become holders. If they have fewer battles, then there is still stronger supporting evidence for the value of territorialism; if more, this would be a better explanation of why floaters continue to float.

The spectrum of behaviour exhibited by bird species in response to predators is fully covered in the Turdidae. There are, as mentioned, the extreme skulkers, mostly in the genera *Zoothera*, *Luscinia* and *Brachypteryx*, which avoid exposure to predation, at least by hawks (Accipitridae), by hiding in the depths of undergrowth and by revealing themselves only briefly and/or only vocally. There are also the extreme extroverts, such as the Cape Robin-chat and the Karoo Scrub-robin, the latter of which is so bold in mobbing potential predators such as mongooses (Herpestinae), snakes and domestic cats that its Afrikaans names include *slangverklikker*, meaning "snake-proclaimer", and *katlagter*, or "cat-mocker". In this regard, the bold coloration of some of the desert-adapted wheatears, which are so aggressive to their congeners and conspecifics, would appear to represent a pugnacious but foolhardy challenge to any predator. This striking coloration, however, is possessed mainly by those wheatears which use more broken terrain, so that the black-and-white pattern helps to break up the bird's outline in a landscape of shadows, although it is possible that it also assists in reducing metabolic costs between dusk and dawn, and perhaps signals the extreme unpalatability of these birds.



*At the far extreme of the continuum between frugivory and insectivory lies the **Bearded Scrub-robin**. This species has never been recorded eating seeds or fruit, and seems to subsist entirely on a wide range of invertebrates. These it captures by flipping leaf-litter with the bill, or digging in sand or soil. It has also been observed making short aerial sallies after flying insects, breaking open termitaria to access grubs, and hunting the insects flushed by swarms of driver ants. In general, it is quite a difficult bird to see, but it ventures from cover in the half-light of dawn and dusk to feed openly on roads and clearings.*

[*Erythropygia quadrivirgata quadrivirgata*, Mkuzi Game Reserve, Zululand. Photo: Warwick Tarboton]



True thrushes owe their unparalleled success, in large part, to an ecological flexibility which allows them to exploit both invertebrates and fruit. Most are adapted to life on the ground, but make free use of elevated perches: they are capable of foraging terrestrially or arboreally on a wide range of prey items and plant material. Nonetheless, the bulk of the diet comprises invertebrates, most of which are gleaned from the ground. As its name suggests, the ***Groundscraper Thrush*** *is partial to digging or sifting the topsoil and leaf litter with its bill or feet. In so doing it reveals the grubs and sundry invertebrate items which are its staple.*

[*Psophocichla litsitsirupa litsitsirupa*, Kruger National Park, South Africa. Photo: Hanne & Jens Eriksen]

Some members of the family have a permanently "worried" look. S. L. Hilty neatly captures the psychological jizz of Swainson's Thrushes, describing them "as if perpetually fearful, and apt to flee at the slightest movement" and which, at fruiting trees, "stare wide-eyed, then bolt for cover after hurriedly fluttering for a few berries or gobbling *Cecropia* catkins." A very few are absurdly bold. Tristan Thrushes exhibit the extreme tameness of insular animals that have evolved in the absence of predators. One explorer was able to capture specimens of this species with his bare hands or knock them down with a stick; moreover, when camping on Nightingale and Inaccessible Islands, he would be woken up early in the morning by the thrushes hopping around on his body, and in the camp laboratory they walked around among his glasses and journals, inquisitive about everything. Rather more familiar is the tameness of European Robins, which can easily be trained to take food from a person's hand, and which often hop around gardeners' feet as they turn the earth; indeed, an adult once repeatedly flew to the hand of a researcher holding and measuring a brood of five-day-old nestlings and fed them from his fingertips! Likewise, the American Robin forages in among the feet of strollers and joggers in public gardens, as in New York's Central Park.

When directly threatened by a predator, however, all thrushes and chats react in broadly similar ways, depending on context. Bassian Thrushes stay absolutely stock-still when a potential predator comes near, and blend perfectly with the leaf litter. Siberian Rubythroats do likewise, having first turned their back on the intruder in order to conceal the red throat. The Brown Scrub-robin flies up to a perch about 3 m off the ground, there remaining motionless and silent. Turdids in more exposed situations typically make a low fast flight for cover, where they land and hide. In the case of some of the whistling-thrushes, the haven may be the darkness of the caves at the mouths of which they nest. A Mocking Cliff-chat (*Thamnolaea cinnamomeiventris*) outwitted a would-be collector by dodging down and through the burrows of rock hyraxes (*Procavia*), reappearing in completely unexpected places when compared with where it had last been seen. A foraging Red-backed Scrub-robin disturbed by the approach of an observer may fly up briefly, and then drop back to the ground behind a grass tussock and run like a mouse to the cover of the nearest thicket. Sometimes, however, the reaction is to remain motionless. In western North America, adult Mountain Bluebirds (*Sialia currucoides*) hide in grass when a bird-eating raptor appears. Similarly, in the Old World, Redwings have been seen to respond to the appearance overhead of a Eurasian Sparrowhawk (*Accipiter nisus*) by freezing and pressing themselves down in grass, seeming to mimic the large autumn leaves scattered across it; this is presumably the equivalent of the freezing crouch of the Hermit Thrush. As a final example, breeding Fieldfares exhibit a remarkable behavioural adaptation to counter a perceived threat: they defecate on would-be predators (see Breeding).

Avian predators of turdids are typically hawks and falcons. In North America, Sharp-shinned Hawks (*Accipiter striatus*) commonly account for *Catharus* thrushes. Eleven such hawks in Colorado, in the west-central USA, were found to have 3·2% of their diet composed of Hermit Thrushes, many of them fledglings, and migrant Swainson's Thrushes are also frequent victims of this raptor. In Europe, many migrating Common Nightingales, during their autumn migration across the Mediterranean Sea, are caught by Eleonora's Falcons (*Falco eleonorae*). Several other avian predators exist, however, including the Great Grey Shrike (*Lanius excubitor*), which frequently takes Grey-cheeked Thrushes in the taiga–tundra shrublands. On one occasion, a young female Hermit Thrush was seized in flight by a Western Scrub-jay (*Aphelocoma californica*) which launched a surprise attack from a hedge. The larger gulls (*Larus*) pursue tiring migrant thrushes and chats as they approach land, catching them in the bill or using the feet or wings to knock them into the sea.

Body mass is now thought to be a decisive factor in predation avoidance, since extra weight probably compromises escape-flight efficiency. In his work on Common Blackbirds, W. Cresswell has examined the conflict between increasing body reserves, in order to reduce the risk of starvation, and curtailing body reserves, so as to reduce the risk of predation. Since highly efficient foragers would be expected to manage this balance well, he predicted that relatively poor foragers, in having less foraging success, would paradoxically lay down more body reserves against the risk of starvation. This turned out to be the case: Common Blackbirds with high relative foraging rates had lower body reserves during the winter months, and it is these efficient individuals, therefore, that are most likely to escape predation during this period. Almost certainly, foraging efficiency is in part a function of age, and the age-class of Common Blackbirds that is most vulnerable to predation will be the relatively inexperienced first-



As with all Turdus *thrushes, the main terrestrial foraging technique of the* ***Sooty Thrush*** *requires a three-part sequence of actions, the first involving a brief burst of running or springy hops, the second a pause to listen or observe, often with head slightly cocked, and the third a quick pounce if prey is detected. This last action might result in an insect being seized and swallowed in a single movement, or else to a bout of soil digging or leaf-tossing in order to uncover suspected prey.*

[*Turdus nigrescens*, Cerro de la Muerte, Costa Rica. Photo: Michael & Patricia Fogden]

years. By extrapolation, this applies to all thrushes and chats and, indeed, to all avian species.

Of course, inefficient foragers, young individuals, will also be more liable to death by starvation. For every species of thrush and chat that has been studied in sufficient depth, survival rates of young birds are lower than those of adults. In the case of European Robins in Britain, the mortality of yearlings after 1st August is 72%, whereas annual mortality of adults is 62%; for the same species in Belgium, the corresponding figures are 71% and 54%. The mortality of yearling Common Blackbirds in Britain after 1st August is 58%, whereas adults have an annual mortality rate of 44%. In North America, the corresponding figures for Swainson's Thrush are 74% and 44%, and for the American Robin approximately 75% and 48%, while for the Omao, in Hawaii, mortality of one-year-olds and two-year-olds combined is 60% and that of adults 34%. Survival of first-year Song Thrushes is correlated negatively with the length of cold-weather spells in winter, whereas adults are able to withstand such periods because of their dominance and efficiency at berry sources. Survival of adult Song Thrushes, on the other hand, is correlated negatively with the length of warm summer droughts, when there are neither earthworms and snails nor berries for them to exploit.

There are other effects, too. In order to live a long life as a thrush or chat, it is helpful to be male and to be tropical. For example, adult mortality in one British study of Common Blackbirds was only 41% for males but 66% for females, and at one site on Hawaii the annual survival of male Omaos was twice that of females. Among White-starred Robins (*Pogonocichla stellata*), the survival rate of breeding birds in South Africa was 77–90% for males, as against 68–84% for females, and in Malawi the average annual survival was 79–83% among males but as low as 60–71·5% among females. Similarly, the annual adult survival rate of Chorister Robin-chats is 87% for males and 70% for females. In the case of this species congener, the Olive-flanked Robin-chat, an extraordinary level of difference between the sexes has been recorded, with an annual mortality rate of just 13·7% for males contrasting with the 43·3% found for females. One species to buck this trend is the Wood Thrush. Data derived from one long-term study of this Nearctic turdine indicate that females live on average about a year longer than do males, generally reaching senescence in their eighth year, whereas males become senescent in their seventh year.

Meanwhile, R. E. Ricklefs, using a large sample of museum specimens, estimated annual survival rates of American thrushes and found them to vary from a mean of 56% in temperate North American populations to 68% in subtropical South American populations, 76% in lowland tropical populations, and 80% and 85% in tropical montane populations in Central and South America, respectively. Survival rates of these species are most strongly correlated with the difference between maximum and minimum mean monthly temperatures; in other words, survival is inversely related to seasonality of temperature. Many questions arise from this, but it is well understood that migration, a common response to strong annual fluctuation in temperature, brings with it elevated risks.

There are few data on longevity among the Turdidae, and single records tell very little, but it is interesting that, of the two longest-lived thrushes recorded in the wild, one, a Mistle Thrush from temperate climes, and a migrant, was at least 21 years old, while the other, a Chorister Robin-chat from the tropics, and a resident, achieved at least 26 years. Even the tiny White-starred Robin has been recorded as living to 14 years of age. Otherwise, a captive male Blue-shouldered Robin-chat was still siring two broods annually at the age of 24.

Voice

Of all the many distinctions in the ornithological world to which the thrushes and chats lay claim, it is for the sheer beauty and versatility of their songs that they probably achieve the highest public esteem. No other family combines such richness and phrasing of some species with such astonishing imitative capacity of others. In North America, the forest thrushes all carry the flame for the family; in the Neotropical Region, the solitaires, one or two nightingale-thrushes and one amazing *Turdus* do so. In Africa, the robin-chats and scrub-robins are the supreme vocalists, this position being held by the nightingales and shamas in Eurasia.

Ecologists and systematists working on some of these birds have been prompted by what they hear to shelve their sometimes

dry terminologies and to break out into song of their own. Here are Slud's words on the Black-faced Solitaire in Costa Rica:

> "The disembodied song, hanging in the air like an echo, its struck-crystal timbre harmonizing with the chill surroundings, is almost impossible to trace... Stressing virgin clarity of tone instead of vocal pyrotechnics, this solitaire is surely one of the most refined singers of this or any country. Its song has reached a substance-shedding extreme to which the nightingale thrushes and *Hylocichla* thrushes, so to speak, aspire."

Here is G. M. Sutton waxing more personally lyrical over the Brown-backed Solitaire (*Myadestes occidentalis*):

> "It was so brilliant, so amazingly complex, that I could scarcely believe my ears... The... body of the song, the song proper, was a slowly descending, sadly sweet whistle accompanied by such a profusion of grace notes... so beautiful, so wondrously like musical fireworks, that I opened my mouth and gasped. Never in all my journeyings had bird-music wrung from me such ineffable applause, or filled me with such wild, half-furious exultation. 'I've never heard! I've never heard!' I whispered to myself, as if confessing that up to that high moment my ears had never fully functioned."

And here is Skutch on the same species:

> "How shall I set about to describe a song so utterly unlike all familiar bird songs, and how can I convey the reverential feelings that it inspires as one stands listening to it amid the dark mountain forests?... The *Guarda Barranco*'s music is a chiming of sweet-toned pipes, a wild, jingling melody that, heard from a little distance, fills the listener with a profound sense of the freedom of the forest and its mystery... I loved the music of the Guardian of the Ravine for its wild, unstudied exuberance, which expresses the untamable spirit of nature... a wild untutored mountaineer, careless of studied art, but overflowing with joyous vitality that must find vocal expression."

Again and again one finds the voice of a thrush or a robin being picked out as the sweetest song to be heard in a country or a continent; and again and again one finds the voice of a thrush or robin being used in poetry to fix a moment of union between man and nature (see Relationship with Man).

Of the songs that impress human ears, perhaps the best are those of the most solitary species. The name "solitaire" was particularly well chosen, conveying, as it does, not only the isolation of the singer but also its diamond-like vocal purity. Invariably, these songs are composed of rich, pure sounds that have recognizably musical dimensions. The words "flute", "bell" and "whistle" commonly appear in descriptions, and some of the very best singers operate in conditions, such as cold still canyons, or warm still nights, in which their voices will resonate and amplify so as to carry over unexpected distances. On the other hand, some turdids are simply very loud. The song of Swynnerton's Robin (*Swynnertonia swynnertoni*) is a startlingly powerful utterance for so small a bird, as are the final notes of the crescendo song of the White-browed Robin-chat, at which, in Oatley's evocation, "the bird's whole body seems compulsively committed to pumping out the song—the tail jerks, the wings flutter and the air-sacs in the neck and clavicular region are visibly inflated".

By way of contrast, the songs that are often least impressive come either from among the most gregarious species, such as the American Mountain Thrush (*Turdus plebejus*), the Sooty Thrush (*Turdus nigrescens*), the Redwing and the Fieldfare, or from those, such as the forktails and water-redstarts, for which the ambient sound of running water represents too strong a competitor. The song of the highly sociable Grandala has seemingly atrophied to a version of the call, and this is to some extent true also of the Fieldfare and its half-hissed cackles. The Fieldfare's partly onomatopoeic Finnish name, *räkättirastas*, perfectly captures the cacophonous *racket* produced by loose groups of singing individuals in the trees around houses where people are trying to sleep; by chance, the alliterative suffix *rastas* means simply "thrush".

Of course, the solitary/sociable aesthetic is not clear-cut. So shrill, displeasing and persistent is the song of the fairly solitary Glossy-black Thrush (*Turdus serranus*) that A. H. Miller wrote "we noted almost with relief the cessation of their song". Perhaps he took further relief in shooting some, whereby he was able to determine that, in South American *Turdus* species, song is directly related to gonad condition and breeding activity, whereas, in the case of the Andean Solitaire, it appears to continue independently of sexual development.

Like other passerines, the thrushes and chats sing mainly during the breeding season, and mainly at dawn and dusk. Indeed, many species in this family, including the Omao of Hawaii and the Malabar Whistling-thrush (*Myophonus horsfieldii*) of India, are well known as the earliest singers in the morning and the latest in the evening. At key points in the breeding cycle, however, individuals can sing almost all day, and a few species sing also at night, at least on moonlit nights, as does the Spotted Palm-thrush (*Cichladusa guttata*), or in lamplit areas, as does the European Robin. Nevertheless, owing to the strong territorialism of many turdids, and to the fact that this can extend throughout the year (see General Habits), song is common in the non-breeding period, too, although it is often then different in quality. During the breeding period, only the males commonly sing, although there are many exceptions to this, as illustrated by, among others, the Veery during pair-formation, when both sexes sing back and forth to each other, and various African robins, including the Brown-backed Scrub-robin, pair-members of which duet, and the Cape Robin-chat, the female of which performs shorter, quieter versions of her mate's song. With regard to the last-mentioned, however, Oatley relates how a colour-ringed female in his garden, following the death of her mate of seven years, performed full territorial advertisement song daily from his songposts, persisting in this behaviour for 12 weeks. Outside the breeding season, however, if a species sings at all, and especially if it defends individual winter territories, then both males and females sing, as in the case of the European Robin.

Some species, such as the *Neocossyphus* and *Stizorhina* myadestines, deliver relatively undeveloped, primitive songs, and the turdine cochoas and Rufous-brown Solitaire (*Cichlopsis leucogenys*) offer nothing better than convergently similar long



The foraging methods of Turdus *thrushes are a common sight on garden lawns in both Old and New Worlds. They run, pause, and stab at the ground, especially after rains have summoned worms to the surface. These are extracted with swift determination, but how are they detected in the first place? In answer to this debate, it was found that an* ***American Robin*** *deprived of sight, smell and touch, could still forage perfectly well on buried prey, presumably by using audial cues alone. This explains the tilted head of the hunting thrush, a posture that facilitates the detection of infinitesimal wormy sounds below the lawn's surface.*

[*Turdus migratorius*, Grey County, Ontario, Canada. Photo: George K. Peck]

high whistles. For most thrushes and chats, however, song typically consists of extended series of highly modulated phrases. Each phrase may resemble the preceding one exactly, closely or moderately, depending on the species and the individual, but it usually exhibits some difference, so that the number of discrete phrases used in a song is high. Among the slower-singing thrushes, these differences may be very obvious. In parts of China, the Common Blackbird is known as "one-hundred tongues" on account of the variety of its song, and such a name will be understood by everyone who has heard the species sing. With some other turdine thrushes and the faster-singing chats, however, it can sometimes be difficult to discern the variation, or, at least, its extent, and if the phrases are sufficiently disjunct, as is so with the Whinchat, then each phrase becomes thought of as the song itself. The difference between these two general types of song as exhibited by thrushes, one relatively complex and continuous and the other relatively simple and strongly spaced, has been thought to reflect the difference in the degree to which the songs are used for female attraction (the first type) or male repulsion (the second type), but modern evidence tends to suggest that this interpretation is too simplistic.

The function of avian song is still a matter of much study, and the Turdidae, owing to their accessibility and amenability, have been key experimental subjects in this aspect of biological science. With this work there has emerged a growing appreciation that the complexity of many species' songs cannot be ignored as just random meaningless babble, but that it is, instead, a crucial part of the birds' existence and as essential to them, and to our understanding of them, as are blood and feathers. Song is information. It conveys with considerable precision the circumstance and status of the singer, and it allows the listeners, including local territory-holders, floating males prospecting for a territory, unmated females and even, if the singer has one, its mate, to make decisions on the basis of that circumstance and status.

Perhaps the most obvious example of this concerns nocturnal singing by the Common Nightingale. This wonderful sound, one of the greatest inspirations to the human listener (see Relationship with Man), conveys one major piece of information: that the singer is unmated. When the males of this species arrive back on their breeding grounds in the spring, all are unmated and all sing at night; the typical pattern is for a rapid increase in singing intensity after nightfall, reaching a broad peak in the middle of the night, and tailing off before dawn. Within a fortnight, however, most females have arrived and most have found partners, so that the males of these pairs are diverted towards activities other than the expensive and now needless business of nocturnal self-advertisement; it should be noted that singing at night results in increased consumption of body reserves. They continue to sing at dawn and dusk, thereby advertising their territorial ownership, but, apart from a short period when their mates are laying, they now leave it entirely to the unmated territorial males to sing throughout the night and to broadcast their status and their need to the listening darkness.

Listening, rather than just hearing, is certainly happening. Late-arriving unmated females, if there are any, will doubtless be seeking to discriminate between performances of available males in order to assess their quality as prospective parents. Mated males in adjacent areas will almost certainly adjust their behaviour accordingly: lack of a female on the territory means that they have less interest in investigating the area. Radio-tracking studies have shown that, while mated territorial Common Nightingales spend 90% of their time within their own territory, for 10% of the time they move quietly into ground held by at least one neighbour, mainly before and during the female fertile period. The time that they spend on such forays correlates negatively with the song rate of these neighbours; in other words, high song rate leads to short intrusion time, and *vice versa*. Song rate therefore appears to indicate male quality, and low song rate is an unintended disclosure to adjacent listeners of opportunities for extra-pair copulations. Radio-tracking has further revealed that non-territorial Common Nightingales also make surreptitious investigations of this sort as they prospect for appropriate sites, approaching the edges of occupied territories mainly in the hour before sunrise, and eavesdropping on their holders' songs in order to assess the quality of the singer.

When two rival Common Nightingales begin to countersing, which tends to happen when all or part of a territory is under dispute at the start of the breeding season, something very akin to a human argument happens. This involves, first, an exchange in which each listens to and directs itself at the other, and then, if neither is convinced of the other's superiority, an escalation into an approximately face-to-face overlapping duel in which the two sing at each other simultaneously, with the rate of the song and



*Snails make up a large part of the diet in a few thrushes, most famously the **Song Thrush**. The tough calcified shell deters most avian predators, but this species has learnt a behavioural trick to bypass the snail's defences: it carries its victim to an "anvil", usually a rock, root or paving stone, and beats it to smithereens. By holding the shell's rim, or the snail itself, and by hurling the hapless mollusc downward and sideways with a vigorous flicking motion, the thrush cracks open the shell to reveal soft flesh within. This is wiped on the ground to remove inedible fragments, and finally consumed.*

[*Turdus philomelos clarkei*, Sussex, England. Photo: Roger Wilmshurst/ FLPA]

the level of interruption increasing. Thus, degrees of self-confidence are being conveyed and tested to the limit. In the case of Song Thrushes, countersinging can be extraordinarily loud, the voice being used very much as it is by arguing human beings, as a means of conveying the physical power and level of aggression of the owner. In contrast, the song of European Robins in this situation becomes an almost continuous, low-amplitude "twittering", a kind of subsong, presumably owing to the greater predation risk that loud singing would engender.

Even when aggressively countersinging, however, the singers are capable of learning from each other. When male White-crowned Wheatears countersing, each uses the same song type as that of its rival, and, when a tape is played to one of them, he responds by switching to the song coming from the tape. This ability to pick up and use new material is widespread in the family, and in its extreme form results in the mimicry of exceptional distinction which many species display. Moreover, it is apparent also at the other end of the spectrum with such species as the simple-songed Redwing. Populations of this thrush in southern Norway have been shown to possess clearly defined, annually constant song-dialect areas. Researchers have found 27 such areas, ranging in size from 2 km² to 159 km², with a mean of 41·5 km², within each of which almost all males sing the dominant song type, although some may produce a secondary song type based on the dominant type in an adjacent dialect area. Something similar has been found among both Common and Thrush Nightingales, neighbouring males fine-tuning their repertoires to match each other so far as possible. This conformity, the taking-over of elements from a rival and using them in reply, is assumed to be a strong indicator of territory tenure and, thus, important in repelling rivals and attracting mates. It hints at a tension between the needs for stability and innovation. Stability may be desirable because it permits an environment of minimal conflict, and results in a local "dialect" or "accent" which may help to indicate adaptive occupancy of a particular tract of land; and innovation may be desirable because it permits adaptation to the real, changing environment, and may help to indicate the relative genetic diversity of the singers.

Thus, for example, the Veery can distinguish between the songs of neighbours and those of strangers, reacting far more aggressively when one of the latter intrudes on its territory than when one of the former does so. In this species, as with the nightingales, it would appear that familiarity with neighbouring songs allows stability in relations and, hence, minimal affray and risk. This may also be the case with the Bearded Scrub-robin, different songs of which even the human ear can distinguish by the intervals between phrases and the duration of the series. For the Varied Thrush, on the other hand, studies of song structure suggest that males alter the frequency and duration of their long, thin song notes in order to reduce habituation by their neighbours. Further, while both Swainson's and Hermit Thrushes have predictable sequences to the songs that they sing, the Grey-cheeked Thrush deploys at least 14 constant discrete sets of notes in five fairly constant sequences, or "song types", but the song types themselves have no fixed order and appear to be given randomly. In the late evening in Newfoundland, in east Canada, Grey-cheeked Thrushes form "singing groups" in which individuals perch and sing close to one another. To what extent are they copying and, conversely, to what extent are they avoiding copying their neighbours?

They are, at any rate, being stimulated to sing by each other, as singing intensity, at least among turdids, is a function of population density. The song frequency of an American Robin, for example, is positively correlated with the number of its neighbours. A most poignant further instance is that of the Olomao (*Myadestes lanaiensis*) population on Molokai, in the Hawaiian Islands (see also Status and Conservation). This species became increasingly silent there as it grew rarer and more thinly distributed, and, although it continued to be observed into the 1980s, its song had by then not been heard for decades. Presumably, it continued to breed for some time without the necessity of defending territorial space against other males or of seeking new female partners, activities which are also a cost in terms of increased predation risk and energy loss. The offspring of these silent breeders would themselves, of course, be unlikely to acquire songs of their own.

Yearling male Common Blackbirds initially learn their songs from their neighbours, a situation that applies also to Common Nightingales and is presumably normal for all thrushes and chats. This first-spring exposure is extremely important to the ultimate acquisition of full song. In the early stages of the spring, the yearling Blackbird may repeat the same phrase many times in succession, but as the season advances it steadily develops the ability to vary and recombine the phrases which it learns. "Sentences"



Thrushes are not well known as adaptable opportunists, seeming instead to have a few tried and trusted foraging tactics with which they faithfully persevere. In many cases, however, they have learnt to make use of concentrated supplies of insect prey. Some species follow ant swarms, or large herbivores, to hunt the insects disturbed by their passage, sometimes even alighting on mammals to glean their ectoparasites. Others, like this ***Plain-backed Thrush****, are attracted to rubbish tips and dung heaps at the edge of towns where insects, grubs and worms abound.*

[*Zoothera mollissima*, Naini Tal, India. Photo: Christian Artuso]



Some thrushes eat small vertebrates such as rodents, amphibians and reptiles, as this male ***Blue Rock-thrush*** *so aptly demonstrates. It has captured a small* Podarcis *lizard, a form of prey that is often found in abundance on the sunlit rocks of the rock-thrush's favoured habitat. There is even some evidence that breeding adults preferentially target such lizards during the nestling phase, and use them to provision their offspring. This makes sense in view of the protein, calcium and energy content of a soft-bodied animal, versus an insect or a fruit.*

[*Monticola solitarius solitarius*, Navalmoral de la Sierra, Ávila, Spain. Photo: Juan Manuel Hernández]

—chains of phrases in a preferred order, but lacking pauses—are sometimes formed, and repeated sequences of particular phrases are elaborated, at least by some individuals. Discernible variations in quality of song, such as were noted also for the Common Redstart by J. Buxton, very probably reflect different ages of singers, but also, inevitably, the different environments in which they are raised. In the early parts of the season, Common Blackbirds seem to practise their songs, often sitting in the middle of a tree. Bearded Scrub-robins quite often do the same thing, prefacing a period of "public singing" in the treetops with a spell of "private practice" in the undergrowth.

The extent to which such "practice" is confined to younger members of the population is not established, but for Common Blackbirds, at least, song-learning appears to continue throughout the individual's life, with little material being discarded, so that over five years or more the only change in the repertoire is in its increasing diversity. The rich, fluting phrases that are the hallmark of the mature Common Blackbird song may have been copied from neighbours, but the variations become increasingly individual; it is in the high-pitched flourishes, or "codas", concluding each phrase that the opportunity arises for direct mimicry of non-blackbird sounds, although these are often hard to detect. One coda incorporation that began to be heard on suburban estates in Britain in the 1990s was the car alarm in its various manifestations. Experimental work by T. Dabelsteen and co-workers has shown that the habitat-induced "degradation", in terms of carrying distance, of the Common Blackbird's song is inversely proportional to the height at which it is heard, but is unrelated to the height at which it is transmitted. This suggests that the main reason for a male to sing from a high perch is to improve his ability to hear responses to his songs, rather than to maximize the transmission distance of his own.

In Australia, mimicry is most advanced among bird species which are highly territorial and live on the forest floor, where visibility is low. While many thrushes and chats conform to this pattern and sing from low perches in deep cover—Crossley's Ground-thrush (*Zoothera crossleyi*) of Africa even singing from the ground—many are nevertheless open-country species using low but exposed perches, and a few are forest-canopy singers. A comprehensive explanation of avian vocal mimicry is still lacking, but there are some pointers. For example, mimicry by the Black-eared Wheatear is reportedly greatest in the 15-day period between the males' arrival on the breeding grounds and the arrival of females, in which case it is not likely to be used for attracting females. Moreover, as just noted, Common Blackbirds introduce mimicry into the phrase coda, which has been demonstrated by research not to be used by or directed at females but, instead, to be aimed at neighbouring males; it is, presumably, the phrase codas, and the important status information that they contain, to which high-perching singing males are listening. Both of these facts suggest that mimicry is primarily a male–male signal of status and quality, although in some extreme cases its function may have shifted.

The speed at which vocabularies can be extended is striking. A singing White-crowned Wheatear, one already noted for instantly imitating tape-recorded song, began to mimic the motor-drive and shutter click of a camera even while its picture was being taken. The White-throated Robin-chat immediately copies novel sounds within its preferred frequency range, sometimes causing great confusion to people using whistles for maintaining contact in the bush. Whinchats copy imitations from each other. At one locality, calls of a Common Swift (*Apus apus*) and a Common Nightingale mimicked by one male Whinchat entered the repertoire of its neighbour within a few days, and were being used by half of the local population after a week. This last anecdote is a reminder that mimics do not necessarily acquire other species' sounds through direct auditory contact, but can do so by copying from the vocabulary of another mimic. With the Rufous-capped Robin-chat, such instant vocal copying is integral to the interactions within local populations. A male of this species, when singing against its neighbours, will suddenly interject a particular imitation, of, say, an African Fish-eagle (*Haliaeetus vocifer*), only for it to be repeated by all the neighbouring robins, and then, abruptly, another individual introduces the call of another species, which in turn is taken up by the others, this being followed by a further one, and another, and so on. In this example, the "copying" may, of course, be only repetition, since most or all of the population may have learnt the calls long before, but it tends to confirm that the main context of turdine mimicry is masculine.

Interaction between males is, however, by no means the only context for mimicry. *Cossypha* robin-chats have also acquired the ability to deploy mimicry of other species' alarm calls when an alarm call is appropriate, as when their young are at risk. Not only





In temperate thrushes invertebrates dominate the diet during the breeding season, with fruit predominating for the rest of the year, although even in mid-winter insectivory is never entirely revoked. These photographs show two species of Turdus *with Siberian breeding ranges: the* ***Eyebrowed Thrush****, mostly confined to tall coniferous forests; and the* ***Dusky Thrush****, found in montane shrubland and riverine birch woodland at the fringe of tundra. These habitats are productive in summer, but inhospitable in winter, when both these species are forced to migrate to more southerly climes. There, they commonly form flocks and switch their attentions from insects to fruit, ranking among the most frequent visitors to berry-laden shrubs and trees.*

[Above: *Turdus obscurus*, Oulu, Finland. Photo: Markus Varesvuo.

Below: *Turdus eunomus*, Aomori, Japan. Photo: Hirozo Maki]

do they give their own distinctive alarms in such situations, but they also intersperse them with the alarm calls of many other species. This is presumably adaptive, since the young rapidly associate the alarm calls of other species with genuine danger. Interestingly, the White-browed Robin-chat, the only member of the genus not to use mimicry in its songs, is an accomplished mimic of alarm calls. A further, and remarkable, context in which mimicry is used by robin-chats was recorded by Oatley and involved a pair of Chorister Robin-chats. This pair shared its habitat with Southern Boubous (*Laniarius ferrugineus*), a malaconotid species in which the male and the female duet. The robin-chats were seen on one occasion to call to each other in precisely the way in which the boubous do, one individual using one call and the other using a different one to reply, in an extended sequence. The robin-chats were, therefore, not simply mimicking the calls of the boubous, nor even, as with the alarm calls, merely using them in the context in which the calls are given, but also, and most awesomely, adopting the exact roles of the original pair of callers.

A parallel example of seemingly "intelligent" use of mimicked sound has been reported for a six-year-old captive White-rumped Shama. What most impressed E. Tretzel when he taught the shama to sing a musical scale was not the rapid learning or the accurate reproduction *per se*, although both these aspects were remarkable, but the fact that the scale was introduced and concluded with other sound groups in such a way as to create a passage with a pleasing effect of completeness, implying "a special sense of form and compositional ability on the part of the singer". Research on the Rufous-capped Robin-chat has demonstrated that this species indiscriminately mimics every sound that it can in its acoustic environment, with the one constraint that it cannot mimic complex vocalizations. The example of the White-rumped Shama, however, suggests that, even if the sounds used by these mimics are simple, the configurations into which they are assimilated may be anything but that. Similar processes of individual variation and "signature" may lie behind the already mentioned variations on a theme made by the aptly named Varied Thrush and the unpredictability of song-type sequence exhibited by the Grey-cheeked Thrush. But why do some Cape Robin-chats mimic extensively while others never imitate any sounds?

The prevalence and range of mimicry in the thrush family is extraordinary, with at least 78 of the 336 species, 23% of the Turdidae, known to use it in some degree. The Common Rock-thrush has been recorded as imitating the songs of as many as 23 Palearctic bird species, including the entire song phrase of a Chaffinch (*Fringilla coelebs*). In southern Africa, the average repertoire of a territorial male Chorister Robin-chat in KwaZulu-Natal included some 25 imitated calls of other species. This robin-chat has been known to imitate the yapping of small dogs and the horns of railway locomotives, while Rüppell's Robin-chat (*Cossypha semirufa*) copies various mechanical sounds and has been heard to mimic both the call and the drumming of a Bearded Woodpecker (*Dendropicos namaquus*). In recent studies, it was established that a single Kalahari Scrub-robin (*Erythropygia paena*) had a repertoire of over 40 calls of other species. Even more impressively, the total number of bird species known to be imitated by the Bluethroat is at least 64, of which 14 are found only in the New World, where the Bluethroat occurs only in a tiny part of the extreme north-west; these imitated Nearctic species range from the Bristle-thighed Curlew (*Numenius tahitiensis*) to the Golden-crowned Sparrow (*Zonotrichia atricapilla*). The Rusty-tailed Wheatear is reported as imitating the whistling of the wings of vultures, the bleating of sheep, and the sound made by the striking of an axe. A further interesting example of mimicry by turdids comes from the southern Neotropics. In the darkness before dawn on a rainy night, when petrels (Procellariidae) were leaving their hillside nests and returning overhead out to sea, an Austral Thrush singing above a shoreline camp-site very softly gave a direct imitation of the sounds of the petrels at a distance.

For a combination of range and quality of mimicry, however, nothing matches the accomplishment of Lawrence's Thrush (*Turdus lawrencii*) in South America. This is especially notable, as the South American *Turdus* assemblage is otherwise relatively undistinguished in its vocal and mimicking ability. In a discovery that was therefore as unexpected as it was astonishing, the late T. A. Parker found that the song of this modest-looking thrush consists entirely of near-perfect imitations of Amazonian forest wildlife, particularly the calls and parts of the songs of many bird species ranging from tinamous (Tinamidae) and parrots (Psittacidae) to formicariid ground-antbirds and to grosbeaks (Cardinalidae), with a single individual copying the sounds of up to 35 other species. Study of recordings of some 30 or so Lawrence's Thrushes revealed imitations of no fewer than 173 bird



*The **Eastern Bluebird** eats insects all summer but in autumn and winter it consumes a huge number of fruits and berries. In common with other seasonally frugivorous turdids, this species plays an important role as an agent for dispersal of seeds, especially as it wanders widely in winter and is thus likely to have travelled some distance from the parent plant before defecating. If seeds are retained too long in the intestinal tract they are damaged by digestive enzymes and germination is impaired. Of interest, therefore, is the discovery that some berry-bearing plants produce a laxative chemical that ensures rapid progress through the avian gut.*

[*Sialia sialis sialis*, Freeville, New York, USA. Photo: Marie Read]



Among the strangest of all thrushes are four species in the genus Cochoa, *all of which are beautiful creatures of the middle storey and subcanopy of humid Asian forests, where they are relatively difficult to observe because of their habit of perching motionless for long periods. Their sluggish demeanour, and their simple but extraordinarily high-pitched songs, bring to mind some Neotropical cotingids. Likewise, they appear to be largely frugivorous, with broad gapes designed, if this photograph of a* ***Green Cochoa*** *is anything to go by, to admit the passage of large drupes. They are often found in fruiting trees, but rarely noted foraging on the ground, or sallying for insects.*

[*Cochoa viridis*. Photo: Khun Chitapong Kuawong]

species, as well as ones of frogs and insects. So faithful are the renditions that ornithologists have begun to use them to judge whether certain species are present: several apparently out-of-range species have been found at sites simply because they were searched for after their songs were heard in the repertoire of Lawrence's Thrush. Males sing for hours from songposts in the canopy, with intermissions of 5–15 minutes. Playback produces no visible response, suggesting that the song is directed at females, and Parker predicted that the species would prove to have a promiscuous or polygynous mating system (see also Breeding). There is a puzzle why it extensively incorporates imitations of one common and frequently vocalizing raptor, the Black Hawk-eagle (*Spizaetus tyrannus*), while never mimicking another, the Roadside Hawk (*Buteo magnirostris*). This seems to have been solved by Tobias, who finds that Lawrence's Thrushes almost always avoid short single-note songs, like the hawk's, and choose instead songs with a little more complexity, usually lasting a second or more, like the eagle's.

If, in the case of Lawrence's Thrush, sexual selection drives the mimicry, so that the extraordinary ornamentation of its song is akin to the extraordinary ornamentation of a bowerbird's (Ptilonorhynchidae) bower, there remains the puzzle over what is the motive power behind mimicry in other species. Buxton, in his study of Common Redstarts, contemplated the notion that listeners might be discouraged by the illusion that various competitors were present, which is a prototype of the Beau Geste hypothesis, but he could not then explain why the redstart so persistently mimicked a bird so ecologically uncompetitive to redstarts as the Willow Warbler (*Phylloscopus trochilus*). On the other hand, if all imitative thrushes and chats are programmed simply to assimilate all the sounds of their environment, as does the Rufous-capped Robin-chat, it could be argued that such mimicry signals that any individual managing to hold a territory in so heavily and diversely occupied a parcel of habitat must be of the highest quality. This is not exactly consistent with the Beau Geste hypothesis, which proposes that the signal creates an illusion of heavy and diverse occupation by direct competitors; instead, it is more of an honest signal, although the opportunity to be dishonest presumably exists for this species, as for others, through the vocal copying of neighbours without having primary contact with the source of the mimicked sound.

Another intriguing discovery of Parker's, and one which is reasonably consistent with the idea that mimicry is a display of "personal quality", was that two close relatives of Lawrence's Thrush, the Pale-breasted and Hauxwell's Thrushes, responded to playback of their own, plain songs by singing songs full of mimicry. One must assume that these responses were intended to demonstrate to the intruder a breadth of ability that would register in the latter's mind the need for caution, yet it seems as if the birds were so disconcerted by the sudden proximity of a confidently singing conspecific that they were temporarily left in a state of jabbering incoherence. This impression is reinforced by the fact that, in at least one instance, the delivery was at the volume of subsong, or "whisper song". In high-intensity contexts such as courtship and confrontation, however, the songs of some species become ever more strangled and wheezy, a trait displayed by the Black Redstart, the Thrush Nightingale and the European Robin. Increasingly loud countersinging is presumably the more frequent response when neighbours have more equal status.

Variations in the quality, type and timing of song by thrushes and chats are considerable, but they are, in fact, relatively poorly documented and are only slowly being understood. Context, age of singer, season of year and time of day all play a part in such variations, as, indeed, does background noise. Common Nightingales, for instance, can adjust the volume at which they sing to compensate for traffic-generated white noise, although not without a cost in terms of energy. In the course of a spring day, for example, the Common Blackbird delivers a pre-dawn song, which is relatively subdued and slow; a dawn song, which is the most beautiful, varied and loud; a daytime song, which is less protracted and often less ornamented than that at dawn; and a dusk song, loud but relatively repetitive and often curtailed. Similar within-day variations almost certainly occur in many other species, but they probably exist in forms often too subtle for the human ear to distinguish between them. These subtleties doubtless convey different types of information to the various listeners. It is increasingly clear that song in the breeding season serves various purposes, albeit most importantly and predictably female attraction and male deterrence. With bluebirds, it also facilitates the transfer of food to incubating or brooding females, nestlings and fledglings, and it warns mates, nestlings or fledglings of the presence of a potential predator. Among many species, from solitaires to wheatears, song given during song flight is often discernibly, if subtly, different from perched song, and it is likely that it has a greater specificity with regard to one or another function, most probably mate attraction.

Song-playback experiments in the territories of 26 male Bluethroats resulted in an increase in song and song-flight activity among apparently unmated males, those having no females visible in their territories, whereas males seen to be guarding females did not respond to song playback but remained silent, closely guarding their mates. This interesting finding has been interpreted as indicating that, for this species, song serves not only in mate attraction but also in male–male competition. Nevertheless, while it is entirely likely that song is as much a deterrent to other males as it is an attractant to females, any outbreak of song at an unexpected time of day is likely to indicate that an unmated male is attempting courtship, which, of course, implies the presence of an unmated female. It is hardly surprising, therefore, that nearby unmated males would instantly commence giving songs and song flights of their own; and it is equally unsurprising that a mated male would elect at this moment to stay very close to his female for fear that she may be mistaken for the expected mateless bird.

The situation may alter dramatically later in the breeding cycle. There is, for example, a short period of 3–4 days when mated male Common Nightingales resume nocturnal singing; this is the period when the female is laying eggs. The reasons for this reversion to high song output are unclear. The male may be attempting (a) to demonstrate his quality to the female and thus stimulate her reproductive effort; or (b) to deter rival males, as intensified singing, even though it risks announcing the female's fertility, on balance reduces external interference; or (c) to attract females for extra-pair copulations at a time when his mate is not in a position



*Thrushes are essentially solitary, territorial birds in the breeding season, but those inhabiting high latitudes are sometimes gregarious, especially in winter. Five species inhabit Europe during this season, two of which are migrants, and all of which have gathered to eat apples on this English lawn. Pictured here, clockwise from the top, are a **Fieldfare**, a **Song Thrush**, a **Common Blackbird**, a **Redwing** and a **Mistle Thrush**. In this instance they have been brought together by low temperatures and a shortage of food, but they make a common enough congregation in fields and paddocks along many a country lane.*

[*Turdus pilaris*, *T. philomelos*, *T. merula*, *T. iliacus* & *T. viscivorus*, England.
Photo: Mike Wilkes/ Nature Picture Library]

to prevent him. In the case of European Robins, it is the second of these options. Males of this species sing and patrol their territories most intensively during the female's most fertile period, and experiments indicate that they do so to signal their presence as a deterrent against neighbour intrusions, in order to minimize the risk of cuckoldry. There is a particular need for this, since the female vocalization used persistently in this fertile period is her "seep" begging call. Neighbouring males are attracted by this sound, as it reveals the time-window in which they can obtain paternity through extra-pair copulation. In contrast, although noon is the time when most female American Robins lay and immediately following which they are reportedly at their most fertile, their partners sing rather little at this time. This turdid's song, however, may not be used in the same way as is that of the European Robin; thus, synchronous emergence of female American Robins from their nests at dawn causes synchronous termination of the dawn chorus, whereas asynchronous nest visits by females over the day and in the evening result in asynchronous and scattered periods of song during those periods.

With Common Redstarts, the pattern of male singing is apparently somewhat different again. The male sings from his arrival on the breeding grounds, from territorial establishment, through mate acquisition and up to the moment when the female starts to bring nest material to the hole that he has found for her. While the female builds the nest he is completely silent or, at best, gives no more than a subsong, but he restarts singing as soon as egg-laying begins, and continues all through incubation. When the eggs hatch the male again ceases singing, and he stays silent until the chicks are independent, resuming only if a second brood is to be raised. Further contrast is provided by Common Stonechats and Bluethroats, songs of which diminish significantly or halt almost completely once incubation begins, although unpaired males continue singing right through the summer, and males with failed nests immediately resume singing.

In the case of Song Thrushes, the singing pattern throughout the year is often very distinct but highly variable, and involves variable numbers of singers. There are several major pulses lasting for weeks, but these are not well understood; the amount of rainfall is possibly a key spur, and cold weather is generally an inhibitor. Crucially, it is only at dawn and dusk that all the males of pairs sing, while later in the day often only unpaired males persist, so that censuses based on daytime songsters underestimate the population; moreover, in southern England, at any rate, many males of pairs that subsequently breed sing very little or not at all from February onwards. In one part of Switzerland, Song Thrushes exhibit two peaks of singing in the breeding season, one roughly from late February to early April and the other from mid-May to early July. The second pulse starts at the end of the breeding season and persists for too long to be associated with male deterrence or female attraction, and it is postulated that it may serve to teach newly fledged birds and/or as a means for staking a prior territorial claim to the area for the next breeding season. With Black Redstarts, autumn song given between the end of moult and the abandonment of breeding territories, and delivered mainly by males two or more years old, helps these males to establish territories in food-rich sites, as at log stacks with high insect abundance, and thus increases the holder's survival chances. It also improves reproductive success in the ensuing spring by drawing in experienced females to pair, briefly, with the singer as a basis for the coming season's endeavours; in one study, 59% of such autumn pairings were renewed in the following spring. In North America, Townsend's Solitaire sings throughout the year, with peaks from April to May and from September to November, corresponding to the time of establishment of summer and winter territories, respectively. Whereas, in spring, the males of this species sing more often and more loudly than do the females, the two sexes devote equal amounts of time to singing on their winter territories, which are, of course, individual territories. This is not, however, entirely the case with wheatears; although song is deployed by both sexes on their individual winter territories, it is generally less frequent among females than among males.

In autumn, in particular, many species of thrush and chat, and perhaps all of them, produce a subsong. This has three characteristics that distinguish it from full song. First, it is a very quiet vocalization, typically audible at less than 30 m; second, it is sustained for many seconds in a curious rambling agglomeration of twittering and warbling notes, into which elements of the true song, as well as calls and pieces of mimicry, are woven; and, third, it is typically delivered from low in the vegetation or on the ground. Subsong can be heard at a very early stage from certain species, including wheatears when only two weeks out of the nest, when it appears to be associated with the establishment of individual distance. Migrating Redwings in perched

flocks give subsong, presumably for similar reasons, and Eyebrowed Thrushes (*Turdus obscurus*) do likewise when in spring flocks. Various ant-following chats in tropical Africa deliver such songs, and individual distance, again, may be a prime driver in these often rather competitive contexts. Among species in which both sexes sing, both also utter this quiet rambling version. A type of subsong, commonly called "whisper song" in North America, is heard in the spring months from turdids in aggressive interactions or during courtship. These songs may be a little louder than typical subsongs but, unlike full song, they are heavily aspirated. Measurement of heartbeat rates in Common Blackbirds indicates that even subsong, although often given in seemingly relaxed circumstances, is mildly stressful; in aggressive and courtship subsongs, the heartbeat rates are probably maximal.

Most members of the Turdidae have several calls. The Cape Robin-chat has only a single call, used for both contact and alarm, but this is unusual as a general condition, and apparently unique in the genus *Cossypha*. More typically, the Common Blackbird has many calls. These include a short contact call; a longer flight call; an aggressive warning call; a mild alarm call; an aerial-predator alarm; a distinctive ground-predator alarm; a territorial-defence whistle; a distress call; a courtship call; a nestling-feeding call; and a nestling-warning call. There may be more, or possibly fewer, owing to the somewhat subjective way in which calls are reported and collated, but this enumeration will probably be found to be matched by many of the species in the family once they have been more closely studied. Vocabularies probably reach the maximum breadth among species which are both sociable and territorial, since the diversity of contexts of communication is then greater. More solitary and more sociable species probably both have somewhat reduced vocabularies.

The word "chat" derives from the sharp burry "chak" sound that certain species in the subfamily Saxicolinae make as a general alarm call. It is typical of the Common Stonechat, the English name of which supposedly reflects the fact that its call sounds very like two stones being knocked together. Another, rather more intense alarm call common to many chats is a clearer "hwee" or "whit" sound, and many species have the habit of combining the two together. This "whit-chak" combination is the hallmark of *Saxicola* chats and, to a lesser extent, the wheatears in the genus *Oenanthe*, but it is also uttered in various manifestations by a number of essentially Palearctic genera and species. These include the Bluethroat, Indian Blue Robin and Siberian Rubythroat, in *Luscinia*, and, especially, the *Phoenicurus* species, such as Common, Daurian (*Phoenicurus auroreus*), Moussier's (*Phoenicurus moussieri*) and Güldenstädt's Redstarts. The early-nineteenth-century English poet John Clare, in his poem "The Firetail's Nest", refers to a nesting female Common Redstart which "pipes her 'tweet tut' fears the whole day long". Northern Wheatears use the combined call when the "chak" or "tut" alone is not enough to warn off an intruder, and Common Stonechats do so in similar situations, the "whit" call serving as a warning while the "chak", combined with short flights and wing-flicks, has a distraction function. There is an echo of these calls and their meanings in the European Robin, which gives "ssssiiip" calls as an alarm warning, causing other birds to fall silent and hide, and "tic" calls as a challenge and distraction.

Nestlings and newly fledged individuals have strong begging, location and distress calls. This is, of course, as may be expected of a family in which the young leave the nest typically a few days before they are capable of strong flight (see Breeding).

Finally, many thrushes and chats make mechanical, non-vocal sounds in various contexts. Some of them, for example, snap the bill quite loudly during violent confrontations and when captured. The Collared Palm-thrush (*Cichladusa arquata*) often claps its wings together in flight. Some solitaires and other North American thrushes, when approaching a conspecific intruder in a winter territory, make "winnowing" sounds with their wings just prior to landing, this noise presumably serving as a warning of their readiness to attack. Hermit Thrushes, when in an anxious state of indecision over attacking or fleeing, rattle dry leaf litter by making a foot-quivering manoeuvre.

Food and Feeding

Key to the success of the Turdidae is the dietary flexibility of most of its members, the ability to switch opportunistically between invertebrates and fruit. Despite the crucial role that it plays, however, fruit is fundamentally the first alternative to invertebrates, and nearly always the lesser partner in turdine diet. The typical pattern, at least in temperate species, is for invertebrates to dominate the spring and summer diet, with fruit an increasingly impor-



*All turdids, including the **African Thrush**, drink with the standard passerine motor pattern, first submerging the bill beneath the water surface, then tilting the head back so that the bill points slightly upward. This action presumably gathers water inside the mandibles, then causes it to trickle down the gullet with ease. A few thrushes are also capable of drinking without raising the bill above the horizontal, but this is less frequent and is usually accompanied by rhythmic contractions of the gular region.*

[*Turdus pelios chiguancoides*, Gambia. Photo: Mike Wilkes/ Nature Picture Library]



Chats drink in a similar manner to thrushes, as illustrated by this ***Güldenstädt's Redstart****. Similarly, their favoured drinking sites are sources of standing water, such as ponds, puddles and bird-baths, but flowing streams are also utilized, as long as they are not too turbulent. Not surprisingly, species inhabiting humid regions drink more than those of waterless lands: many desert-dwelling chats, including a range of wheatears* (Oenanthe)*, go months without drinking, subsisting merely on the limited water contained in their diet of beetles and seeds.*

[*Phoenicurus erythrogastrus grandis*, Shey marshes, Ladakh, India. Photo: Otto Pfister]

tant component from late summer until late winter, but rarely totally replacing the animal component. In the diet of the American Robin, for example, the proportion of fruit shifts from less than 10% in the spring to more than 90% in the autumn and winter; it also, incidentally, increases from morning to afternoon, presumably reflecting the more favourable conditions for foraging on many terrestrial invertebrates in the early part of the day. Some species probably feed entirely on invertebrates, but none is known to subsist entirely on fruit, although a few come close.

True thrushes, the Turdinae, forage for invertebrates mainly on the ground, taking small creatures in the leaf litter, on the surface, and also in the topsoil, where the often staple diet of earthworms is to be found. Typically, the foraging technique involves a three-part series of stop/start and pouncing actions: running or hopping very briefly in quick spring movements, pausing to listen and observe, and, when food is seen or suspected, making a quick dab or pounce at the substrate and either seizing and swallowing the prey item in a single movement, or sweeping aside litter to expose it or digging at the earth to uncover it. The three components vary, of course, with opportunity. Often the thrush makes repeated runs or hops and pauses before effecting a feeding strike, and often it makes repeated feeding strikes at an advantageous spot. Frequently, too, individuals will flick aside litter without making a discovery, doing so repeatedly in the quest for a find; thrushes in forest and woodland where the top litter is dry can give themselves away with the resultant rustling that they make. One writer describes how the Orange-billed Nightingale-thrush, after flicking aside a leaf, raises its head up quickly "as if fearful its actions might have attracted attention".

Members of this subfamily forage not only in deep shade amid trees but also out in the open, and they are the most familiar of sights on grass lawns in private and public gardens, their technique of stop/start and pounce on full display. The English poet Ted Hughes brilliantly captured the strange intensity of such foraging by the Song Thrush:

> "Terrifying are the attent sleek thrushes on the lawn,
> More coiled steel than living—a poised
> Dark deadly eye, those delicate legs
> Triggered to stirrings beyond sense—with a start, a bounce, a stab
> Overtake the instant and drag out some writhing thing.
> No indolent procrastinations and no yawning states,
> No sighs or head-scratchings. Nothing but bounce and stab
> And a ravening second."

On more litter-rich substrates, Song Thrushes displace loose material with the bill by means of a rapid flick of the head, sometimes driving the bill slightly into the substrate to displace dry soil as well. There can be five or more successive flicks as a thrush scours a promising spot. In both this species and the Common Blackbird, the bill-flick is sometimes accompanied by a simultaneous, but scarcely visible, backward scratch of the foot, using the left foot with a leftward flick and the right foot with a rightward flick; this co-ordinated movement of the bill and foot is an attribute shared with few other bird families. In more tangled undergrowth, individuals use the bill to yank or toss back twigs and stems in order to reach substrates. In an amazing modification of this behaviour, a Common Blackbird was seen to employ an 8-cm twig to sweep snow 5 cm deep from a small area in order to get at the ground beneath. When foraging in deep litter, some species, including the two just mentioned, will use the feet and legs repeatedly to scratch litter and soil away from a promising spot, making sharp darting movements or flicks of the head as they do so, thereby removing detritus and exposing and breaking the surface of the soil.

What cues does a ground-foraging thrush use to find its food? Clearly, when a bird makes a short sudden rush forwards and snatches an item, it is responding to a visual cue only. Sound, however, is evidently also important. In experiments in which four American Robins were disallowed visual, olfactory or vibrotactile cues, the birds were able to forage effectively on buried mealworms, suggesting they were using only auditory stimuli; this deduction was reinforced when, in response to white noise, their foraging success fell significantly. Olfactory and vibrotactile cues have not been investigated, but both are suspected of playing a part, perhaps varying in degree with species and/or context. The Bassian Thrush in Australia stops and listens at a spot, peering intently at the ground, and then raises itself up on its toes and rapidly vibrates its body for several seconds. These vibrations apparently cause worms to rise to the surface or, at least, to move and thereby reveal their location more precisely.



Thrushes are not restricted to terrestrial sources of water for their drinking requirements. This ***Kurrichane Thrush*** *is taking advantage of water trapped at the base of a snapped branch, and similar use will be made of any such arboreal pool by forest species. Temporary water supplies appear after rainfall in all manner of situations, including guttering, bowl-shaped epiphytes, upturned seed-pods and the like. Thrushes have also been seen to gather dew or melting frost, and some are known to eat snow during the winter.*

[*Turdus libonyanus*, Okavango swamps, Botswana. Photo: Geoff McIlleron]

This type of behaviour is also performed by the closely related Common Scaly Thrush. Whether the bird hears or feels the worms' response is not known, but these are species which often forage on the forest floor and adjacent trails in very low light intensity, when visual cues are likely to be relatively weak. As a matter of interest, the importance of vibrations in bringing earthworms to the surface in areas close to lorry-bearing roads, and in grass exposed to helicopter down-draughts, has been noted in Britain.

Other thrushes which commonly excavate the soil for invertebrates seem likely to have similar systems of detecting hidden prey. None is yet known, however, that is so remarkable as the reported "wind-breaking" also used by the body-shivering Bassian Thrush, a technique requiring internal physiological adaptation (see Morphological Aspects). The thrush hops or runs several paces and then stops momentarily, probing, and moves on. A noise somewhat louder than the bird's footfalls, coincident with a "vent-dipping" movement very like that used in defecation, and believed to be "a burst of air from the vent", has been heard immediately after each stop, followed by probing or more hopping. It is assumed that this sound, audible to human ears at 5 m, has some effect in stimulating a movement by an underground worm, giving away the latter's position. It has been heard only when Bassian Thrushes are foraging.

A much commoner additional technique for finding prey is foot-quivering. This is performed by a number of species, including the Bassian Thrush, but is particularly pronounced among migrant *Catharus* thrushes, which also use this behaviour as an aggressive signal. The bird stretches its head and neck forwards, the bill parallel to the ground, and rapidly vibrates its toes on the substrate. Immediately afterwards it stops stock-still to scan, often then pecking forwards at the ground; observations revealed that the Veery made forward pecks on 60% of such occasions, the Grey-cheeked Thrush on 67%, and Swainson's Thrush on 70%. Similar behaviour by certain African robins has been witnessed. When foraging in leaf litter, the Brown Scrub-robin sometimes appears to "mark time" by pattering the leaves, first with one foot and then with the other, and, again, it is presumed to be attempting to disturb small invertebrates from their hiding places in the litter.

When a food item is found, it is usually snapped up and swallowed at once. Earthworms, which often wrap themselves reflexively around the bird's bill, are sometimes beaten on the ground, as are other large invertebrates that need to be processed before ingestion. The Song Thrush has a familiar trick when dealing with snails. It carries its victim to a place with a hard surface, such as a stone, a large tree root, a cement floor or a brick wall, and, holding either the shell by the aperture or the snail itself, it proceeds to beat it on the chosen "anvil" with a combined downward and sideways flicking action of the head, so that the snail loops up and over the bill from one side to the other, thus achieving maximum speed at impact. Usually the shell breaks after just a few strikes, and the snail is then exposed and, after being wiped on the ground, eaten. Other thrushes eat snails, but usually smaller ones that do not require this hammering process. Furthermore, Song Thrushes need to be vigilant, as their larger congeners, if in the vicinity, are quite liable to rob them of their prey. A relative that also uses anvils but, having no sympatric congeners, appears to run no risk of robbery, is the Gulf of Guinea Thrush. This species accumulates such large middens of shells at hammering sites that it has been speculated they may possibly be used in part as signals of territory quality or of the territory-holder's ability to provide food.

Thrushes are not usually territorial while on migration, but the maintenance of distance between individuals, which may be achieved partly by foot-quivering, may be important in ensuring access to areas of ground undepleted by other foragers. Competition between ground-foraging thrushes certainly occurs. Studies have shown that the feeding rates of a Common Blackbird decline significantly with the arrival of a competing individual at a foraging patch: when the nearest-neighbour distance was always less than about 5 m, rates dropped to 16–43% of the feeding rate of a lone individual. Feeding-rate declines were similar whether the individuals interacted aggressively or apparently ignored each other during feeding, and the effects of a single competitor on a blackbird's feeding rate remained the same even when the foraging patch was twice as large. There is, therefore, a trade-off between the benefit of group-feeding, such as collective vigilance for predators, and the cost of monitoring other individuals within the group in order to avoid interactions. This trade-off is different for dominant individuals, presumably older birds or males, compared with subordinate ones, presumably younger or female birds. Dominant individuals may even profit by using subordinates as



Given that nest-building in thrushes and chats is almost always the sole responsibility of females, it is interesting that this ***Sooty Thrush*** *(pictured carrying nesting material) is a male. Where species of* Turdus *are concerned, males often accompany females during the nest-building phase in order to guard them from the advances of rivals. Occasionally they help collect a small amount of plant matter for the nest, but they tend to pass this to the female, rarely if ever actually adding material to the structure.*

[*Turdus nigrescens*, Cerro de la Muerte, Costa Rica. Photo: Michael & Patricia Fogden]

food-finders, and the persistent displacement of subordinate birds may well explain some of the differential migration patterns exhibited by some turdine species (see Movements).

Collective vigilance is certainly a benefit for species adapted to more open-country foraging, since it allows an individual to forage for longer. Birds in larger flocks gain energy more rapidly than do those in small ones or those foraging solitarily. Interestingly, however, both Redwings and Fieldfares, two of the most familiar of open-country foragers during the non-breeding season, have higher rates of energy intake on old pasture when they forage in mixed flocks than when they keep to single-species flocks. It is usually the case that the Fieldfares join the Redwings on old pasture, and they are thought to use the Redwings as cues to the location of prey items. The Redwings must also benefit, however, through the decrease in time individually dedicated to predator vigilance.

Observations of foraging Fieldfares revealed that an individual typically made an average per minute of 8·1 pauses, 2·5 crouches, 1·3 ground probes and 0·75 snatches. The crouched position evidently indicates a greater lunging effort to obtain the prey; bigger earthworms are extracted when a Fieldfare crouches than when it does not. The forward movements can be rather leisurely walks among the other thrushes or light-footed tripping hops. A study of Fieldfares in Sweden indicated that 37% of all ground-stabbing attacks result in the capture of in-soil prey, while 58% of ground-gleaning attacks result in the capture of on-soil prey. It can take only a second to extract the smallest worms, those smaller than 37 mm, and a few seconds to mandibulate them into the carrying position for delivery to the young; the extraction of the largest ones, those longer than 137 mm, takes about 8 seconds, with more than a minute required for them to be mandibulated as feedable items.

Where sociable thrushes co-occur, their ecological separation appears to be related to bill size. Indeed, bill size is evidently critical in resource-partitioning in any syntopic assemblage of thrushes or chats. On the non-breeding grounds, Redwings and Fieldfares segregate their terrestrial prey rather neatly. In one study, the former was found to take 67% on-soil items and 33% in-soil ones, whereas the corresponding figures for the latter were 44% and 56%, respectively. In winter, the on-soil invertebrates are smaller than the in-soil ones, and it is energetically more rewarding for the smaller-bodied, smaller-billed Redwing to go for the former and for the larger-bodied, larger-billed Fieldfare to go for the latter. Thus, only 20% of soil items taken by Redwings are larger than 10 mm, whereas 45% of those taken by Fieldfares exceed this value. Moreover, there is a degree of ground-habitat partitioning between these species, with Redwings preferring long-established pastures, where on-soil prey are more abundant, and Fieldfares preferring newer pastures, where earthworms, although less abundant, are easier to detect and reach. Naturally, when it comes to taking berries, the heavier Fieldfare may be dominant, but the smaller Redwing is more able to hover-pluck berries that the Fieldfare cannot reach. Similarly, sally-hovering by Townsend's Solitaire allows it to reach berries at the tips of branches or on the undersides of snow-encrusted branches that are unavailable to larger or less agile competitors such as the American Robin.

There is, of course, also competition from ecologically similar but unrelated species. *Catharus* thrushes wintering in Panama, compared with resident species in the same guild, feed more frequently on non-flying ants, beetles (Coleoptera), insect larvae and gastropods, but most significantly on non-flying termites (Isoptera), centipedes (Chilopoda) and millipedes (Diplopoda). The immigrant thrushes also show a clear preference for berry-like fruits with small to medium-sized seeds. Thus, they do not generalize on superabundant invertebrates, but specialize on a few invertebrate taxa of two types. The first type consists of small, hard-bodied foliage-dwelling insects such as beetles and ants, which are of relatively low nutritional value, and the second comprises invertebrates well known to produce distasteful or toxic chemicals, such as non-volant termites, centipedes and millipedes. The facts that migrants take a low quality and low diversity of animal prey and that they also possess highly overlapping diets could be taken to imply that they are weakly integrated into the tropical bird community. In reality, however, the absence of much dietary overlap between migrants and residents using a similar foraging substrate indicates how spectacularly well they are integrated into that community.

Ability to exploit relatively poor and, in some cases, seemingly noxious foods, notably ants, is certainly one reason for the success of the Turdidae. The chat radiation in Africa and Asia, surely one of the most complete, in terms of geographical cover-

age, of any taxonomic group of birds on these vast continents, owes much to this ability. Nowhere is this more evident than with the wheatears, which uncannily derive a boundless energy on seemingly the least nutritious of foods, namely ants and other literally desert-hardened invertebrates, notably beetles. Ants, however, are eaten extensively by other genera, too, particularly those adapted to dry rocky landscapes; the Southern Anteater-chat's scientific name *Myrmecocichla formicivora*, meaning "ant-eating ant-thrush", makes the point very firmly. Many of these open-country, ant-eating species cast pellets owing to the amount of chitin in their prey, and they have pronounced wing-flicking movements when they move to snap up a food item. When taking prey insects, the Blackstart, the Pied, Desert and Rusty-tailed Wheatears and, most of all, the White-crowned Wheatear commonly flash open both wings, occasionally briefly holding them open, and the assumption is that this action startles the victim into a self-disclosing movement, or somehow disorients it. Possibly, there is a link between this behaviour and the noxiousness of the victim, which may need to be grasped at a particular angle to minimize the risk to the predator. Alternatively, and more plausibly, the wing-flashing actions of these chats with prey signal their presence at and possession of a resource.

Like the true thrushes, the chats most commonly forage on the ground, many using the same technique of hopping, pausing and pouncing. However, with some obvious exceptions, such as the whistling-thrushes, they have a bill that is too small for digging and is designed, instead, for surface-gleaning. Naturally, therefore, the saxicolines forage more by visual cues than do the true thrushes, so that their movements on the ground involve shorter pauses and more direct bounding strikes across the substrate to secure prey. These are often labelled "dash-and-jab" movements, and they are most strongly developed among open-country birds. The possession of a small bill, however, means that the body is also small, and this circumstance allows many species of chat to employ foraging techniques which would, for heavier birds, be energetically too expensive to repay the effort. These saxicoline techniques are the "perch-and-pounce", also known as still-hunting, perch-foraging and ground-sallying, which involves flying from a low perch to take prey on the ground, and, less frequently, the "leap-and-snatch", in which the chat sallies or leaps into the air to take flying insects. Several highly successful chat genera, including *Phoenicurus*, *Saxicola*, *Oenanthe* and *Cercomela*, use perch-and-pounce as their main foraging method, with leap-and-snatch as a secondary method; so, too, do the myadestine bluebirds in the genus *Sialia*. The smallest, lightest species of chat, those in the genera *Sheppardia*, *Pogonocichla*, *Stiphrornis* and, to a lesser extent, *Tarsiger*, have become part-time flycatchers, while *Cossyphicula* forages almost entirely by aerial sallying. Up on the sides of desiccated ravines, the Hooded Wheatear also takes most of its food in the air.

Ants play another key role in the feeding ecology of many turdid species. In Africa and the Neotropics, army ants or driver ants move across the forest floor in broad columns that disturb all the living creatures in their path. Many thrushes and chats are drawn to the front and sides of these swarms, where they pick off the hundreds of invertebrates as they flee. In Africa, the genera *Stizorhina*, *Neocossyphus*, *Pseudalethe*, *Alethe*, *Pogonocichla*, *Swynnertonia*, many *Sheppardia* and many *Cossypha* species, some *Zoothera* thrushes and some *Erythropygia* scrub-robins follow or, rather, "lead" ant swarms, the first four genera semi-obligately. In the Neotropics, some *Myadestes*, *Turdus* and *Catharus* species, as well as the Wood Thrush in *Hylocichla*, are known to follow army-ant swarms, but in all cases this is done opportunistically, owing presumably to the relatively recent oscine colonization of South America, by which time the obligate ant-following niche was already occupied by various members of the suboscine antbirds (Thamnophilidae). Within Turdidae, the ant-thrushes, alethes, akalats and robin-chats take up positions at the head of the ant columns in an alert, agitated state, eager to feed but anxious to avoid the ants themselves, although they frequently eat them, and anxious also to hold a good foraging position in relation not just to conspecifics, but also to other ant-following birds. Consequently, there is much subsong and calling by the birds while attending swarms. Up to 14 Brown-chested Alethes have been seen at one column, and as many as 50 Fire-crested Alethes regularly gather to accompany the ants through the forest. The birds hop on the ground just ahead of the column or perch just above it, and either dash forwards or sally down to seize prey.

Occasionally, other types of "driver" are used. A pair of Rüppell's Robin-chats was once watched while following a suni antelope (*Neotragus moschatus*) and catching in the air the insects that flew up as the suni wandered about. The Orange Ground-thrush (*Zoothera gurneyi*) associates with mole-rats (*Cryptomys*),



*The **White-starred Robin** is one of a small minority of turdids to build a domed nest. The structure is made of dead leaves, rootlets, tendrils and moss, and is usually placed on the ground against the base of a tree or rock. This widespread African chat is not only aesthetically pleasing but taxonomically intriguing. In particular, the existence of an unspotted subadult plumage is almost unique in the family. The various races differ substantially in morphology and voice, but in a patchwork fashion, such that hypothetical subdivision into two or more species would not be straightforward.*

[*Pogonocichla stellata*, Vumba Highlands, Zimbabwe. Photo: Peter Steyn/Ardea]



The use of dead leaves as a platform for the nest structure is rather common in the saxicoline chat radiation, as is the placement of nests in recesses, rather than in the forks of branches. Members of the genus Cossypha *are typical in these respects, building messy, open-topped nests wherever these can be lodged inconspicuously. The construction of this* ***White-crowned Robin-chat****, balanced in the nook provided by the hanging sheath of a palm, demonstrates the advantage of dead leaves: not only do they cushion the nest itself, but added as an outer layer they mimic fallen foliage and thus provide a degree of camouflage.*

[*Cossypha albicapillus albicapillus*, Gambia. Photo: Michael Gore]

profiting from their mound-building activities, which cause litter-dwelling invertebrates to flush from cover. Brown Scrub-robins do likewise, and one has also been seen to follow a daylight-roving porcupine (*Hystrix*) in the forest, evidently for the same purpose. Proof of the value that such "drivers" can represent is the finding that Seychelles Magpie-robins (*Copsychus sechellarum*) on Frégate double their feeding success rate when following a giant tortoise, a person, a cow or a pig, compared with when foraging alone. The situation is sometimes reversed. In the Mediterranean region, for example, Dartford Warblers (*Sylvia undata*) habitually follow Common Stonechats as they forage around their territories. When together with a stonechat, the smaller warbler looks for prey largely on the ground close by, but it feeds mainly in the cover of shrubs when searching alone. It is assumed that either the chat is a reliable indicator of optimum search areas or the warbler exploits its vigilance when looking for prey on the ground, or both. There is, however, a cost to the chat which is manifest in the fact that its feeding success rate is reduced by half when in the company of the warbler, although it is difficult to see why this should be so, unless perhaps the warbler is simply a visual distraction. The chat's response consists mainly of regular perch changes, but the warbler will frequently simply follow it. In Africa, on the other hand, the Common Stonechat and another warbler, the Black-lored Cisticola (*Cisticola nigrilores*), associate in a way which has not yet been evaluated for the advantages conferred, and which may be mutually beneficial; and Red-backed Scrub-robins and Spotted Palm-thrushes have likewise been seen to associate. Blackstarts occasionally form loose foraging flocks with several *Sylvia* warblers, but such behaviour appears to be unreported for other chats.

Although thrushes and chats are by no means so adaptable as, say, the crows (Corvidae), there is much evidence that they indulge in other types of local foraging opportunism. Seychelles Magpie-robins take scraps from tables inside houses and verandas, and Oriental Magpie-robins visit dungheaps in search of maggots, this habit earning the latter species the local name around Hong Kong of "pig-manure bird". Hooded and White-crowned Wheatears, denizens of the hottest, driest deserts, visit nomad camps to take ticks from livestock and pick up any scraps thrown to them, and at Eilat, in south Israel, a White-crowned Wheatear regularly exploited the scavenging opportunites provided by the open-air section of a restaurant on the waterfront. In the Afrotropics, the Fire-crested Alethe occasionally gleans ectoparasites from sitatunga (*Tragelaphus spekei*) and the Chorister Robin-chat does likewise from bushbuck (*Tragelaphus scriptus*). An Indian Robin has been watched while it foraged in the light of fluorescent lamps of a power-station control room, and Sick listed *Turdus* thrushes as among the few birds recorded as feeding under electric lights in Brazil. American Robins nesting near a lake frequently went to forage along the water's edge, taking washed-up insects or insects attracted to lakeside debris. Likewise, a male Common Redstart, having arrived back on its breeding grounds early, during a thaw, frequently flew down to take drowned insects, flushed down in the melting snow, from the surface of water.

Perhaps the most remarkable opportunistic predatory behaviour known for any member of the family is to be found in two groups of Atlantic Ocean islands. On Tristan da Cunha and its satellites, the Tristan Thrush has expanded its foraging niche to the maximum. It has evolved a brush-tipped tongue, helping it to remove the content of the seabird eggs that it breaks open, and it forages down to the seashore for detritus. Recently, however, biologists have noticed the species' capacity for attacking day-flying birds, grappling juvenile *Neospiza* buntings in mid-air, and pursuing and killing fully grown White-bellied Storm-petrels (*Fregetta grallaria*). The storm-petrels visit the islands by day, and are therefore targeted by the thrushes, which chase them in strong level flight 2–5 m above the ground. The thrushes probably also attack storm-petrels when the latter are forced to land in cover to evade pursuit by Brown Skuas (*Catharacta antarctica*). The White-bellied Storm-petrel is about the same size as the Tristan Thrush but weighs less, with a mean of 53 g, as compared with the thrush's 91 g. On two occasions, a thrush was seen perched on top of a living storm-petrel, using its feet to hold down the latter at the base of its wings, and hammering at the back of its victim's head, thereby exposing and caving in the skull, enabling the thrush to eat the brain. Generally, the thrushes have difficulty in consuming much else of the corpse, but they penetrate the skin at certain points to obtain pieces of tissue.

When this extraordinary behaviour was first documented, it was stated to be the first evidence of any thrush regularly killing other birds with a fully ossified skeleton. Thirty years earlier, however, the Austral Thrush was reported as attacking and killing Blackish Cinclodes (*Cinclodes antarcticus*) and Grey-backed



A relatively small proportion of turdids are cavity-nesters, and this behaviour seems to be derived, rather than ancestral. Most ***Common Redstarts*** *breed in holes in trees, but open cup-nests have been found, suggesting that placement of nests in cavities is facultative. It has been further postulated that the hole-nesting habit in redstarts evolved as a defence against brood-parasitism by cuckoos* (Cuculus). *Certainly, cavity nests present difficulties to egg-laying adult cuckoos, as well as their offspring, who find it difficult to evict the host's brood. However cavity-nesting arose, and in direct contrast to the situation in cup-nesters, it is usually the male that selects appropriate nest sites. These he advertises to the female using special displays. The male Common Redstart, for example, flies to a favoured hole and fans his red tail conspicuously as he enters. In the presence of the female he also perches in the aperture and "flashes" the white feathers of his crown. If the cavity is a good one, as in the case of this Welsh oak* (Quercus), *the female adopts it and builds the nest alone.*

[*Phoenicurus phoenicurus phoenicurus*, Wales. Photo: Mike Read]



Hole-nesting also occurs in the myadestine clade, principally in the Sialia *bluebirds. This photograph shows a male* ***Mountain Bluebird*** *clinging to the entrance of a cavity, perhaps to check its suitability for breeding, or to show it off to a female. Males do not usually contribute to the nest-building process itself, but they spend much time in the vicinity during the female's fertile period, essentially guarding her from the attentions of neighbouring males. This type of supervision is important in this genus, as the incidence of extra-pair copulations is especially high.*

[*Sialia currucoides*, White Mountains, Arizona, USA. Photo: Tom Vezo]

Storm-petrels (*Garrodia nereis*), albeit not with quite the same piratical vigour as that of its Tristanian counterpart.

The less opportunistic a species is or, at least, the more regularly but thinly distributed its predictable food resources are, the more likely perhaps it is to behave in a territorial manner. Many species of thrush and chat establish winter feeding territories and home ranges: a steady food supply puts a bird in optimal condition, and thus enables it to continue to assure that food supply. These territories, because they are individual ones and are not required to furnish enough food on which to raise a brood, are typically smaller than summer breeding territories, although the latter, of course, owing to the strong seasonality factor, may be disproportionately rich in food resources. As an illustration, the average size of a Hermit Thrush's summer territory is 0·7 ha, compated with its winter one of only 0·55 ha. In the Neotropics, both resident and immigrant *Catharus* thrushes tend to be intolerant of each other. For example, the Slaty-backed Nightingale-thrush (*Catharus fuscater*) is interspecifically territorial against congeners where their altitudinal ranges overlap, this species and the Spotted Nightingale-thrush (*Catharus dryas*) excluding each other, at least in Venezuela, and the largely resident Orange-billed Nightingale-thrush is aggressive towards migrant *Catharus* thrushes. In the drier parts of north-east Africa and the Middle East, many species of wheatear, piling in for the winter, find themselves competing against congeners as much as against conspecifics for foraging space. Because the habitats of wheatears are so two-dimensional, their territories can be an order of magnitude larger than those of similar-sized or larger *Catharus* thrushes of the tropical rainforest. Recorded territory sizes are 2–4 ha for the Northern Wheatear, 3–6 ha for Finsch's Wheatear, and 5·8 ha for Hume's Wheatear, although they can be as small as 0·8 ha for Desert and Pied Wheatears. The last-mentioned, however, is more aggressive to members of the same sex, suggesting some sexual niche separation in this species.

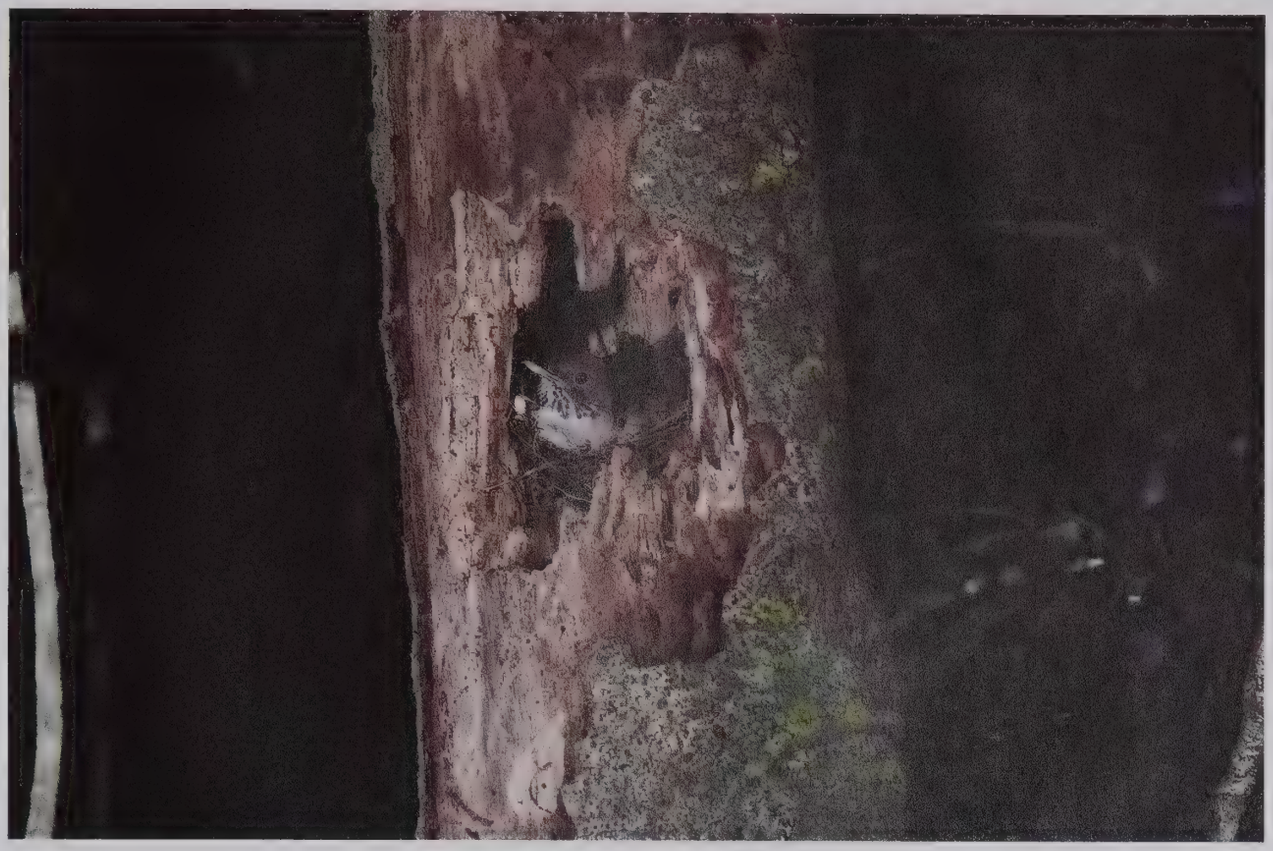
Niche separation according to sex is known to occur with European Robins, despite the fact that males and females have separate winter territories. Compared with males, females forage more on the ground than from perches, although both sexes increase their amounts of ground-foraging with decreasing temperatures, which doubtless render invertebrates less mobile and thus less easy to spot from a perch. With this species there is also a subtle separation of niches through such seemingly minor features as bill size and tarsal length. Long-billed European Robins tend to eat a greater variety of prey sizes than do short-billed ones, and individuals with shorter tarsi tend also to feed on a greater variety of prey sizes. Hence, minor variations in morphology can influence the pattern of foraging behaviour quite strongly, and this, in turn, has implications for patterns of habitat use and seasonal displacements. Some of these morphological differences are, of course, sexual.

In the case of Black Redstarts, the occupation of territories in the autumn enables individuals to monopolize rich food resources



In almost all thrushes, solitaires and chats incubation is never undertaken by the male. Thus, while the ***Redwing*** *is sexually monomorphic, it is nonetheless safe to assume that the bird pictured here protecting the contents of the nest from a shower of rain is a female. As is the case in all* Turdus *thrushes, her nest is an open cup-shaped structure most frequently placed fairly low down amongst the branches of shrubs, hedges and saplings. In this genus in particular, and in true thrushes in general, nests are only infrequently placed in the recesses favoured so widely in the saxicoline chats.*

[*Turdus iliacus coburni*, Myvatn, Iceland. Photo: Collection J./ PHONE/Bios]



While some nests of Turdus *thrushes are placed in recesses, the incidence with which this type of location is favoured is perhaps highest in species of tall tropical forests, such as the* ***White-throated Thrush****. In this habitat predation levels are extremely high, and understorey vegetation relatively scant, so the bulky nests of thrushes would often be too obvious and vulnerable if placed in saplings or shrubs. Instead they are commonly placed on ledges or in half-hidden nooks such as can be found in the stems of palms, or broken stumps, or the complex folds of buttress roots.*

[*Turdus albicollis crotopezus*, Alagoas, Brazil. Photo: Anita Studer]

and thereby to increase their survival chances over the winter, when they move to other places, and it appears also to contribute to greater reproductive success in the following spring (see Breeding). Similarly, experiments with European Robins show that there is a trade-off between the benefits of solitary winter territorialism, which allows access to larger individual food items, and early pair formation, which leads to loss of such access but enhanced breeding success. Males provided with supplementary food were forced to repel intruders more frequently, but they nevertheless advertised for mates earlier and paired earlier. Pair-members which had this extra food supply temporarily withdrawn spent less time in consorting than did others. So, elevated food supply helped individuals to afford the costs of sharing their food resources, and thus to pair and lay clutches early.

The adaptive value of winter territorialism has also been demonstrated in North America for Townsend's Solitaire, a species which is unusual in defending a highly specific type of food resource, juniper berries (see General Habits). Individuals with small territories and fewer berries, usually birds in their first winter, suffer disproportionately high mortality. Nevertheless, each territory always appears to contain far more berries—several million at the start of winter, according to one study—than an individual solitaire could possibly consume, but these huge numbers are judged to function as an insurance with regard to unpredictable incursions by large flocks of berry-eating competitors, notably American Robins, which, unlike Cedar Waxwings (*Bombycilla cedrorum*) and Western Bluebirds, are too big to be displaced by aggression. Only when bad weather strikes, and the availability of food drops dramatically, are there periods when Townsend's Solitaire abandons territoriality in favour of a general wandering through the landscape in search of food.

Even in winter, most thrush species are less specialized on fruit as a food resource, and few, if any, are so universally dependent on the fruit of just one genus as is Townsend's Solitaire, which, incidentally, prefers areas with several species of juniper, probably as a hedge against crop failure in any one of them. In one study of Wood Thrushes in Costa Rica, the fruit and/or seeds of no fewer than 750 plant taxa were recorded in the species' diet, and a study of American Robins in the USA found the fruits of over 50 plant genera in a sample of 1169 stomachs. Therefore, the defence of fruit is elsewhere a much more occasional matter. Mistle Thrushes are perhaps the nearest Old World equivalent of Townsend's Solitaire, being strongly territorial around certain heavily clustered winter fruit resources such as holly (*Ilex*) and mistletoe, and maintaining their control of these small areas, though not necessarily through permanent occupation, for months on end. Fieldfares very occasionally exhibit aggressive "territorial" behaviour over a local fruit patch in very cold weather, but they are too nomadic for any defence of a food resource to last for longer than about two weeks. Nevertheless, the effects are basically the same as when birds defend larger territories all winter. As an example of the latter situation, individual American Robins defending, or "owning", hawthorn (*Crataegus*) fruit supplies have longer feeding bouts, ingest more fruits per bout and forage for fruits more slowly than do intruders, which are forced to attempt to pick fruits almost three times as quickly and ingest twice as many fruits as do owners during their incursions. Such speedy consumption of food is almost certainly not so efficient as the more measured ingestion and fruit choice allowed by resource ownership. Sometimes, however, the strategy of defending a particular patch is wrecked by the influx of a flock of foraging birds, not necessarily of the same species or even of the same family. When this happens, the owner sees its fruit and its future at the site stripped away, and its response may be to join in with the invaders and move on with them.

Moving on is, of course, rather more important for the food plant than for the bird that it supports. The role of thrushes and chats as seed-dispersers is increasingly being recognized, but there appears to be an intriguing trade-off for the plant between the benefits of its seeds being dispersed and the costs of their having to travel through the birds' gut. Several studies have shown that such seeds have a relatively low germination rate, as low as 17–24% in lowbush blueberry (*Vaccinium angustifolium*) seeds taken by American Robins, for example. It is important for the fruit, therefore, that the seeds travel through the gut slowly enough to be dispersed in new areas, but quickly enough not to be impaired for germination. Research on *Witheringia solanacea*, a Costa Rican cloudforest shrub of the family Solanaceae, indicates that this plant's fruit produces a laxative chemical that ensures an appropriately timed passage through one of its main consumers, the Black-faced Solitaire.

In some cases, the seeds are so large in relation to the body of the thrush that they are regurgitated, rather than moved through



*The **Slaty-backed Nightingale-thrush** always places its substantial nest low in an understorey shrub or tree, usually in an upright fork. It inhabits the dripping cloudforests of Central and South America, from Costa Rica to north Bolivia, and it is fitting that it makes use of the most abundant material available in such habitats: bryophytes. It drapes living mosses on the outer surface of its nest, sometimes to an impressive extent, producing a tail of hanging plant matter that mimics the clumps of mossy debris littered all about. The inner layers of the nest are made of leaves, stems, rootlets and plant fibres, and the cup itself is often lined with black* Marasmius *rhizomorphs.*

[*Catharus fuscater hellmayri*, Monteverde Forest Reserve, Costa Rica. Photo: Michael & Patricia Fogden]



*For all its brazen nocturnal eloquence, the **Common Nightingale** is a furtive bird by day and its nest is rarely seen. It is usually situated near the ground, expertly camouflaged amongst tangled debris and leaf litter. In this case it is an open cup, but a domed roof is sometimes added. The female incubates alone, but the male assists in providing her with food, an arrangement that recurs in a variety of thrushes and chats. Courtship feeding in the fertile period may signal the quality of males or their territories, but the advantage of provisioning incubating birds is more direct: it greatly reduces their need to leave the nest, and shortens the incubation period.*

[*Luscinia megarhynchos megarhynchos*, Gaston Copse, Bidden Grange, Hampshire, England. Photo: J. A. Bailey/Ardea]

the digestive system. This happens much more rapidly, and is probably better for seed dispersal. In Brazil, for example, six species of *Turdus* have been recorded as feeding on the bunched fruits of *Livistonia australis*, regurgitating the pits after about an hour. In some instances, the process is even quicker. Here, too, there is, however, a catch for the tree, as a single frugivorous bird species can act as a seed-disperser or a pulp predator for the same plant species. The threshold of these roles is strongly influenced by the ratio of gape size to fruit size. In the Mediterranean region, for example, thrushes of different sizes, from the European Robin up to the Fieldfare, consume olives (*Olea europaea*) of different sizes, from small to large, with the result that all species will swallow some fruits whole but merely peck into others. This also happens with such foods as the dangling, catkin-like fruiting spikes of *Cecropia* trees in the Neotropics, and many other larger tropical fruits, some of which thrushes will not even trouble to peck but will simply discard if they prove too large to be swallowed whole.

Fruit choice is important, as incorrect decisions lead to a waste of foraging time. American Robins foraging on haws use a two-step decision-making process of fruit selection. They need to select first the shrub in which to feed, and then which fruits to pick. Their choices among shrubs correlate with three plant traits: fruit abundance, fruit size, and fruit pulpiness. Once shrubs are selected, American Robins then make visual choices among fruits based on fruit size, taking the largest that they can swallow without difficulty. They also make choices based on colour, red berries commonly being targeted over other colours, and white ones usually being avoided. It has been demonstrated that even the ultraviolet reflection of berries is used by foraging birds as a positive cue in their selection. All studies tend to show that discrimination in fruit choice increases with age, naive juveniles being much less careful in their decisions than are older birds; it is only with time, for example, that they learn to avoid fruit with high seed loads.

This discrimination is doubtless due to the fact that fruits often carry compounds that are not necessarily good for birds, but which, if eaten at precisely the right stage and in rationed amounts, may have little adverse effect on the consumer. The different metabolic rates of small birds mean that certain toxins can be avoided altogether. For instance, one food of the Fieldfare is mezereon (*Daphne mezereum*), which is poisonous to man, and there are even reports of humans becoming ill after eating Fieldfares that had themselves eaten mezereon. Consumption of a small red pepper by Red-legged Thrushes in Cuba prompted C. Vaurie to conclude that the birds' digestive systems "must be quite insensitive", since a pepper that he experimentally chewed was "enough to burn off the lining of my mouth" and, when swallowed, made him "break out in profuse perspiration". Still more amusing, albeit with potentially very serious consequences, this time for the thrush, in terms of predation risk or simply death by falling, is A. Stockton de Dod's anecdote about several Rufous-throated Solitaires feeding and becoming intoxicated on overripe *palo amargo* fruit (*Colubrina berteroana*). She watched one of them as it tried to sing: it sat hunched with its feathers fluffed out, moving its bill without at first producing any sound, appearing to fall asleep and then jerking its head up when about to fall, managing finally the "tweet" part of the song but with the "tu-tu-tu" part drifting away, before it fell off its perch, the fall being broken by ferns, only for it to fly back up and attempt to sing again.

Moderation is, however, the normal practice when fruit-eating. Hilty noted a pattern of activity and inertia among foraging



*This **Black-faced Solitaire** is settling on to her nest, a mossy cup tucked against the trunk of a tree, amongst the stems of creepers. Most of her congeners tend to fix their nests in similar crevices against vertical surfaces, or on steeply inclined slopes. As such, they have tended to benefit from the building of broad forest trails or roads, upon whose banks and cuttings they frequently nest.* Myadestes *solitaires look rather odd for thrushes, being small, upright-perching, arboreal birds with short, broad bills and dense, velvety plumage, but ample research places them firmly amongst the Turdidae.*

[*Myadestes melanops*, Costa Rica. Photo: Michael Fogden/ DRK]

Andean and Rufous-brown Solitaires, and B. K. Snow and D. W. Snow reported the same thing with regard to the winter feeding of frugivorous thrushes in Britain. Fieldfares tend to feed in bouts of 1–2 minutes, taking as many berries as possible, and then resting for 17–26 minutes, the mean resting period being 21 minutes. The largest Fieldfare meals recorded, in one instance 21 ivy berries, ten haws and four hips, each amounted to 6–7% of the species' mean body weight. Individuals that occasionally established territories at fruit resources, however, tended to eat fewer fruit, in shorter bouts, and with shorter intervals for digestion. By way of contrast, a single American Robin, on a very cold day, was seen to pack its oesophagus with fruit in the last two hours before nightfall. The storage of fruit in an extensible oesophagus has been documented for other frugivores, and may be an adaptation to overcome the constraints on food-processing by the gut.

The low moisture content of junipers makes them a more concentrated source of energy and nutrients than are typical succulent angiosperm fruits. This, however, means that Townsend's Solitaires have to drink frequently during the winter and, in arid habitats, will temporarily leave their territories in order to visit a reliable water source, which may be as much as 1 km distant. Townsend's Solitaire usually drinks with the standard passerine motor pattern, submerging the bill and then inclining the head back to swallow. It is also capable of drinking without tilting the head above the horizontal: it stands at the water's edge, leans forward, and submerges its bill, rhythmically contracting the gular region as if sucking, while the neck, head and mouth remain inclined below the horizontal. Other thrushes display similar actions. They drink from standing water sources such as ponds, puddles, streamsides and, of course, birdbaths, but they will also gather dew or melting frost on tree foliage and roofs, and some will eat snow during the winter. Some species, however, notably the desert-adapted wheatears, appear to go without water altogether, but it should also be remembered that some chats acquire both water and sustenance from nectar. In the winter months, the Red-backed Scrub-robin probes aloes (*Aloe*) to obtain nectar, such that its face becomes stained orange with pollen.

Nestling thrushes and chats, at least in the first four days or so after hatching, tend to be fed with softer-bodied prey, such as earthworms or caterpillars. These are highly nutritious and easily digested, allowing rapid chick development, which is good for both the young themselves and their parents as, the shorter the nestling stage, the smaller the risk of nest predation and the sooner the parents can attempt another brood. The adults of some species, the bluebirds being examples, partition the family diet in a marked way, selecting soft-bodied items for their offspring while themselves consuming harder-bodied prey. From anecdotal evidence, it would seem that small lizards are preferentially given to young, in this case older nestlings, rather than retained by the adults for themselves. By the time the young are ready to leave the nest, however, their diet has shifted mostly or entirely to whatever the adults are eating. Once out of the nest, they continue to beg for at least a few days, but also very quickly make their first efforts at feeding themselves. Foraging efficiency is acquired only slowly. Among American Robins, for instance, adults capture larger food items, make more captures per unit time, take fewer steps, and make fewer unsuccessful feeding attempts, than do juveniles, which take about 35% longer to capture each food item, require 60% more steps to do so, and obtain 25% less food per unit time.

In normal circumstances, the daily energy expenditure of a breeding European Robin, Northern Wheatear or Western Bluebird falls between 75 kJ and 100 kJ, or very roughly 2·5–3 times the night-time basal metabolic rate. Evidence varies over how stressful the quest for such energy then is. The average daily food consumption of nestling Ring Ouzels is 2·5 g at day one, 10 g at day five, 19 g at day ten, and 25 g at day 15, which clearly indicates how parental energy expenditure must grow over the course of the nestling period. In the Northern Wheatear, it would appear that the resulting stress is strong. Thus, males and females of this species differ in foraging rates and time-budgets in the run-up to hatching. During the pre-laying and laying stages, the females forage at higher rates than those of males, perch less often, glean more on the ground, and fly less. Although incubation is the least costly phase for females, owing to their low activity, it places restrictions on foraging time that can be overcome only by high foraging rates. After the eggs hatch, females switch to hunting from elevated perches, in the manner of males, and then experience considerable body-mass loss as they fly widely within the territory, to and from the nest. Similar weight changes are observed with Mountain Bluebirds, which lose an average of 3 g during the nestling period, and with Black Redstarts. In both these species, supplementary feeding increases the weight of nestlings at fledging and eliminates weight loss by the adults, which invest



As befits its owner's bodily stature, the nest of the ***Mistle Thrush*** *is a bulky affair, usually placed 2–10 m up in the crotch of a tree, or in the upright fork of major branches. Sometimes it is balanced on top of a horizontal fork, although in this particular case one of the branches has been sawn off. The nest itself is usually built from dry grass, plant stems, roots and moss, and bound together with mud, but here the dominant external feature seems to be lichen.*

[*Turdus viscivorus viscivorus*, Bermillo de Sayago, Zamora, Spain. Photo: Francisco Martín Martín]

more time in maintenance. On the other hand, Western Bluebird adults feeding nestlings older than one week are neither food-limited nor working maximally. The adults can meet their own energy requirements, and those of 4–6 nestlings, while spending less than 10% of their daily activity time in the pursuit of prey; indeed, a difference of two in brood size causes only a minor difference in activity costs, no more than 3 kJ per day.

A juvenile European Robin is estimated to require approximately 4·5 kg of food in its first year of life. When it is adult, however, and weighing about 20 g, it needs almost twice that amount, something of the order of 8·5 kg, which corresponds to a little more than its own weight in food per day, although, if it were totally frugivorous, these values would increase substantially. In order to achieve such an intake of food, hedgerow-dwelling European Robins in Germany, which eat small invertebrates 2–6 mm long, must each consume 700–750 such prey items per day. Wintering Townsend's Solitaires need to consume 250–500 juniper berries daily, although the quantity depends on the species of juniper, the weather and the temperature. The Western Bluebird, with a body mass of 24–31 g, has to consume almost its own weight in insects per day in order to maintain its energy balance. Rather surprisingly, a captive individual of a considerably larger species, the Grey-winged Blackbird, was recorded, 100 years ago, as eating almost its own weight in earthworms every day, but very possibly the high water content of earthworms was responsible for this. The minimum energetic requirement for a wild bird of comparable size, such as a Fieldfare weighing about 120 g, in optimal conditions in mid-winter, is around 220 kJ; such an animal can find food readily, and without long daily foraging flights, on damp ground and on berried bushes in parks and gardens, where micro-climates are often relatively mild owing to the sheltering effects of houses, shrubbery and trees. On the other hand, when the temperature at this season drops to 3° C, the requirement rises to 360 kJ, and it reaches 450 kJ at -5° C, so that, in such conditions, birds are compelled to feed almost continuously simply in order to stay alive.

Breeding

Thrushes and chats are almost entirely territorial, socially monogamous breeders, which means that a pair occupies a breeding territory and the sexes usually have very specific roles. The male establishes the territory initially, following which the female finds and bonds with him and, while he devotes the majority of his time to patrolling and defending the area, she builds the nest and incubates the eggs; both parents feed and tend the offspring. Overt deviations from this pattern are very few, but the story is considerably more complex and intriguing than this outline suggests. Social monogamy, nesting by a single pair, is almost exclusively the breeding system used by the thrushes and chats. Until comparatively recently, this was assumed to equate with sexual monogamy, but the Turdidae have proved to be an important, perhaps the most important, group for the experimental study of sexual behaviour among apparently monogamous birds. The discoveries that have been made shed light not just on the covert practices of pair-bonded birds, but also on many otherwise unexplained patterns of behaviour that such birds display; and the covert practices themselves are fully consistent with Darwinian principles of survival of the fittest and of the self-interestedness of genes.

The first key to breeding success is, however, the territory. Without it, a male stands no chance of obtaining a mate. Non-migratory species of thrush and chat are commonly territorial all year, although for many species there is too little information to be certain, while migratory species may or may not hold territories outside the breeding range. All turdids, however, whether migratory or sedentary, hold breeding territories. The importance of possessing a high-quality breeding territory is paramount. This is what drives the different migratory regimes of temperate species, whereby males invariably arrive back earlier than do females; the males are seeking to claim or reclaim the best sites. For Northern Wheatears, for example, territory quality, rather than individual quality, appears to explain much of the variation in breeding success. To the human eye, determination of territory quality is not easy, and can really be judged only retrospectively, on the basis of breeding performance. Nevertheless, some simple cues have been identified. For example, a method of increasing the attractiveness of a site to Eastern Bluebirds is to furnish it with two nestboxes, rather than just one. An explanation of this appears not to have been formally identified, but it seems very likely that, since the standard turdid response to nest failure is to shift nest-site, the possession of a highly suitable alternative site within the territory is a major form of insurance for both members of the pair. Buxton's well-observed and rather sad account

of a male Common Redstart which frenziedly tried to interest his mate in a succession of nest-holes in his territory, following the pair's eviction from a site by a pair of Eurasian Wrynecks (*Jynx torquilla*), bears this notion out.

The smallest Common Redstart territory documented by Buxton was only 50 × 100 yards, which is equivalent to 0·4 ha or 4000 m². It contained 37 silver birches (*Betula pendula*), 19 willows (*Salix*), 19 poplars (*Populus*), 13 ash trees (*Fraxinus excelsior*) and one each of cherry (*Prunus*), sycamore (*Acer pseudoplatanus*) and beech (*Fagus sylvatica*), along with some big elder bushes (*Sambucus nigra*), some traveller's-joy (*Clematis vitalba*) and a few other bushes and shrubs. Even so, breeding territories of this species have been recorded at one quarter of this size and, as Buxton observed, the extent of the territory is less important than the cover it contains. This is true also of Common Blackbirds, for which shrub coverage is correlated positively with breeding success and negatively with territory size. Breeding success of the Common Stonechat is linked to nest cover that thickens well in mid-season, such as bracken (*Pteridium*) and moorgrass (*Molinia*), as opposed to that which does not, such as heather and gorse (*Ulex*). Wood Thrushes select nest-sites non-randomly within a tract of forest, and females build nests in areas that have a higher density of trees, a higher canopy, a higher density of shrubs, and a greater average shrub height than found at randomly selected points; moreover, the average concealment of successful nests is greater than that of unsuccessful nests. In South Africa, Cape Robin-chat territories vary in size by an order of magnitude, from as small as 0·05 ha to 0·75 ha, but size variation within a given habitat is less than that between different habitats, suggesting that the driving factor behind major size variations is habitat quality.

In the case of the Common Blackbird, the Northern Wheatear and several other turdid species for which relevant measurements have been made, territory sizes tend to be larger at the start of the breeding cycle than at the end. With Eastern Bluebirds and probably all such species, this temporal reduction is thought to be the product of one or a combination of factors. First, prey availability may increase, thus reducing the area needed within which to forage; second, males may be under pressure to guard mates more closely so as to prevent extra-pair copulations, while females may be under pressure to prevent egg-dumping by other females; and, third, the original size of the territory may have been for the purpose of establishing control of several potential nest-sites, but, once one has been used successfully, defence of the others perhaps becomes less important. There may also be an effect of "packing", as later-arriving males squeeze themselves into less valuable habitats between existing territories. The breeding territories of American Robins can be tiny, but this is because they are essentially only for mate-guarding, as the adults range more widely to forage in a communal, undefended area up to 300 m away. Colonial Fieldfares take this condition to an extreme. In fact, even Common Blackbird territories are insufficient for providing all food for the young, and for this species, and perhaps many others, a major though not exclusive function of the territory is, again, that of enabling mate-guarding by the male. This is suggested by the fact that the greatest intensity of male intolerance falls during the female's fertile period, and by his attempts to expand an envelope of territory around a nest-site when a female places the nest, perhaps with intentional ambiguity, on the boundary with another territory.

Proclamation and maintenance of breeding territories are achieved largely by song, notwithstanding the fact that young male Common Blackbirds will sing if they can merely find a song perch, irrespective of a territory. Song is backed up with a repertoire of visual displays and behavioural features. The latter are commonly given throughout the year in various agonistic contexts, but often become more overt, frequent and exaggerated in the breeding period. One type of behaviour which is largely confined to the breeding season and which probably serves mainly



The diet of most adult chats consists of myriad flies and beetles, but these items are at once relatively costly to obtain and bereft of the proteins essential for growth and development. It comes as no surprise, therefore, that many breeding chats switch their attention to soft-bodied prey such as caterpillars, arriving with billfuls of them at almost every visit to the nest, as illustrated by this ***White-browed Robin-chat****. Caterpillars are relatively large, protein-rich and easily captured, providing an excellent source of nourishment for growing chicks.*

[*Cossypha heuglini heuglini*, near Harare, Zimbabwe. Photo: Alan Weaving/ Ardea]



Earthworms are a favourite food of adult thrushes, and they make ideal snacks for nestlings too. Many Turdus *species gather an impressive wormload from lawns and fields before returning to their hungry brood. One such species is the* ***Fieldfare****, a bird with an interesting breeding system and nest defence strategy, at least in Scandinavia, where groups nest semi-colonially in an attempt to minimize heavy losses to predation. This they achieve through a unique communal mobbing tactic involving directional defecation. This seems to ward off most raptors and crows, none of whom show much enthusiasm for getting plastered with sticky faeces and losing the power of flight.*

[*Turdus pilaris*, Germany. Photo: Konrad Wothe]

in mate attraction, although inevitably also signalling territorial occupancy powerfully to neighbouring males, is the aerial song or display-flight. Such flights are not particularly well documented for the Turdidae in general, and seem to be rare or lacking among the true thrushes, but they are widespread in the Myadestinae and the Saxicolinae. On Kauai, in Hawaii, the male Puaiohi (*Myadestes palmeri*) has a display-flight in which he flies up while singing, and then glides back down silently to land near his mate. The Pied Bushchat sometimes performs a display-flight with delayed-action wingbeats, similar to that sometimes given by domestic pigeons or the European Greenfinch (*Carduelis chloris*) in aerial display. A more sustained and more complex aerial display is that of the Bluethroat. The male makes a steep fluttering ascent and then hovers with rapid wingbeats at a constant altitude of 1·5–50 m above the ground, hovering for longer periods the higher he ascends; this is followed by a slow descent with the body held level as the wingbeats decrease in amplitude, shifting to a spinning glide with the tail fully spread and wings in a downward arc, and ending with a head-first dive to the original perch. The performance may last from less than 10 seconds up to as long as five minutes, and cover a distance of more than 300 m, but lower flights are more frequent in the immediate vicinity of a female. The male Güldenstädt's Redstart has a soaring display-flight on quivering wings, showing off his striking white wing patch, and the Plumbeous Water-redstart performs a slow, fluttering aerial display, with the short square tail spread out to its fullest extent. Wheatears all have a display-flight, involving songs and sudden dives to the ground, which is sometimes undertaken in pitch blackness long before dawn, this period of the day perhaps being good for sound transmission.

Early pair formation is associated with greater breeding success, and this can be explained in a variety of ways. As mentioned in the preceding paragraphs, among migratory species, the earliest-arriving males are likely to be of highest intrinsic quality and to obtain the best territories, and they quickly establish pair-bonds with the earliest-arriving females. For the European Robin, however, Tobias has demonstrated a subtler trade-off, one which doubtless applies to other species also. To begin with, there is strong competition for females, such that 20% of males fail to pair; and then, although pairing is initially costly in terms of individual foraging success, as birds on individual territories encounter large food items more often than do those in shared territories, in the long term bachelors are compelled to invest more time in advertising for a mate. Thus, at a certain point it pays to switch from the individual territory to the shared territory. European Robins studied by Lack in south-west England made this switch in the period from mid-winter to late winter.

European Robins are sexually similar in plumage, and pairing, as observed by Lack, appears to be the initiative of the female. Abandoning her own territory at dawn, she enters that of a male and flies directly up to him. He either retreats or, more often, postures aggressively and sings loudly at her, at which she may posture and sing back, holding her ground without getting into a fight. If forced to retreat, the female nonetheless quickly returns by flying back up to the male, something that no rival male would do. In this first phase of pair formation, the two proceed to posture back and forth for an hour or two, sometimes for one or two days, until the male accepts the female on his territory. In the second phase, lasting for several days, she then familiarizes herself with the new territory, making short flights to all parts within it, and the male follows her closely, singing very quietly. There then ensues a long "engagement period" during which the two robins largely ignore each other, the female keeping a low profile and the male singing at moderate strength.

Homologous behaviour is exhibited by the Hermit Thrush and the Veery. Initially, the courtship chase is merely a form of attack by the male and escape by the female, the latter, however, following a roughly circular course to stay within the territory. Within a few days the two individuals fly more slowly and deliberately, pausing and remaining motionless for a few seconds and then resuming; and by the fourth day the male accepts the female on the territory and, although he attacks all others, he no longer attacks her, even when she returns after a brief absence. Among migrants, of course, pair formation is a relatively urgent procedure. For example, a male Common Redstart established a territory on 17th April, a female arrived four days later, some form of pairing was evident by 24th, the first attempt at copulation occurred on 25th, nest-building began on 26th, and the first egg was laid on 3rd May. This species, the sexes of which are easily told apart, also has a courtship chase, but this is evidently more ritualized and presumably lacks the true aggression that initially characterizes the male's response in sexually monochromatic species. The female leads, zipping silently around and weaving through trees and branches and then away, the red tail of each sex very conspicuous and often fanned. Typically, the chase begins from the site of the future nest, and often terminates well away from it.





Presumably because incubation is undertaken by only one sex, sexual dichromatism is common in thrushes and chats. It greatly benefits females to be camouflaged and thus they are usually studies in shades of brown. Males, meanwhile, are free from the constraints of nest predation and many have evolved dramatic patterns and colours. This divergence in plumage would presumably have proceeded through sexual selection, with females consistently preferring the gaudiest males. Regardless of colour pattern, provisioning behaviour in all thrushes and chats studied thus far is characterized by biparental care, as these photographs of the ***Common Rock-thrush*** *attest. Indeed, it is usually males that deliver the bulk of the food consumed by nestlings, at least for the first few days after hatching. During this period the female continues to brood the young, but she gradually invests less time in brooding and more time in collecting food.*

[*Monticola saxatilis*, Burgos, Spain. Photos: José Luis Gómez de Francisco]



This dramatic photograph shows a female ***Black Wheatear*** *returning with prey to a typical nest-site, a rocky crevice in the arid hills of southern Spain. The nests of several species of* Oenanthe *have pebbly ramparts, but this species takes it to extremes. Its nests are characterized by a proliferation of pebbles, most of which are fetched by the male and deposited near the entrance as proof of his prowess. At one nest 9300 pebbles were counted, the largest of which was 28 g, well over half the weight of the bird! Closer inspection has shown that females prefer prolific pebble-bearers, and nests with most pebbles produce most young.*

[*Oenanthe leucura leucura*, Navalmoral de la Sierra, Ávila, Spain. Photo: Juan Manuel Hernández]

In contrast to the above, pair formation in sedentary populations of sexually dichromatic species may be rather less fraught and more protracted. Common Blackbirds, both in their natural range and in Australia, mostly form pairs in the middle and late winter, before the song period commences, although pairing can occur at almost any time except during the moult. The high rates of nest predation suffered by this species constrain breeding success and promote competition among females for high-quality nesting habitat prior to pair formation. Meanwhile, the distribution of females, which tend to share areas with particular males in pseudo-bonds but also often defend small areas against other females, and can fight viciously over access to a particular male, promotes competition among males for areas either already holding females or likely to do so in the spring. Mate choice is itself, therefore, constrained by this intrasexual competition, so that, typically, males and females having overlapping winter ranges pair off on a shared breeding territory. This leads to assortative mating on the basis of competitive ability: pairs are formed by partners of equal quality. The consequences of this later in the breeding cycle are considerable.

Older individuals which have already bred together successfully exhibit some tendency to stay together over the winter period or, at least, to reassociate in the spring. This happens with Common Blackbirds, which either remain together on the male's territory or occupy immediately adjacent areas during the winter period. Likewise, Mourning and White-crowned Wheatears occur in pairs from February to September; outside this period partners often live in separate but adjacent territories, maintaining a close bond or even, sometimes, remaining paired throughout the winter months. Tropical species such as the Bearded Scrub-robin remain in pairs on territory all year, and 27 out of 34 pairs of Common Stonechats in Kenya stayed together over an 18-month period. In the Palearctic, Black Redstart males, before dispersing for the winter, sometimes sing in the autumn and consort closely with their mate of the year, seemingly staking out their claim to the site for the following year. Indeed, in one study, such males produced 5·2 fledged young per breeding pair in the following spring, compared with 3·7 for males which failed to sing, although another study demonstrated that almost all autumn-singing males are full adults, and that this site dominance and pair confirmation resulted in 59% of autumn pairs re-forming in the following spring. In the case of the Mountain Bluebird, it is apparently the nest-site itself, and not its owner, to which the female is attracted, so that re-pairings in subsequent years are probably more a reflection of loyalty to the site than of fidelity between mates. This is homologous with the premium placed on territory quality by Common Blackbirds.

Courtship feeding of the female by the male, the former often soliciting by quivering her wings, gaping with the bill and sometimes making sounds typical of a young fledgling, is a feature of some members of the Turdidae. The variability of the phenomenon among species, and even within them, is not, however, easy to explain. Among European *Turdus*, for example, it is regular for the Mistle Thrush at and away from the nest and for the Redwing only at the nest; it is irregular for the Song Thrush and the Fieldfare and occurs only when the female is sitting; it has been reported but is unconfirmed for the Common Blackbird; and it remains unreported for the Ring Ouzel. Courtship feeding is seen regularly in some populations of the Eastern Bluebird, but not in others. Interestingly, the male Mountain Bluebird frequently feeds the female on or near the nest during the incubation and brooding periods, contributing up to 50% of her food at this stage, and experiments have shown this to increase significantly the more time she spends on the nest. There are several possible advantages in this. First, it may reduce the chances of nest failure through inclement weather or predation and, second it probably shortens the incubation period, thereby increasing the time available for the pair either to raise a second brood or to invest in the care of the fledged young. Courtship feeding by Townsend's Solitaire and by the European Robin begins long before nesting and lasts through the egg-laying period, which presumably enhances the bond and helps to build the female's reserves. In the robin's case, however, the "seep" call that she uses signals not only hunger but also fertility, and attracts neighbouring males, so that the resident male's best strategy, apart from high territorial vigilance and mate-guarding, is to provide her with food very promptly whenever she calls. In the case of the Common Rock-thrush, courtship feeding with mulberries (*Morus*) was witnessed so far in advance of the breeding season that it took place in March in East Africa, some 5000 km from the nearest breeding area. By contrast, such behaviour by the Common Redstart is vestigial in nature, often with no food being passed.



*Another cavity-nesting chat is the **White-headed Black-chat** of the miombo* (Brachystegia) *and mopane* (Colophospermum) *woodlands of southern Africa. The nest itself is a bulky cup of grass, leaf petioles and rootlets, always sited in treeholes. Natural ones seem to be favoured, but the abandoned excavations of woodpeckers (Picidae) and barbets (Capitonidae) are sometimes used. Regardless of their architect, shallow nest cavities are preferred, but they can be up to 30 cm deep. If deeper still, the female (pictured here) tends to fill the base copiously with dung, twigs and leaves.*

[*Pentholaea arnotti arnotti*, Chizarira National Park, Zimbabwe.
Photo: Peter Steyn/Ardea]

As a final example, the myadestine Omao, in Hawaii, demonstrates both vestigial and true courtship feeding. Both pair-members perform ritualized begging, perching side by side and silently begging from each other in turn, but the male also feeds the female, usually while away from the nest but sometimes, as with the Mountain Bluebird, while she is incubating or brooding.

There are many scattered anecdotes about courtship displays by thrushes and chats, but these are often vague and their meaning and context assumed. Moreover, there is no analysis or review to help with the interpretation of the various types of documented behaviour. As Lack noted, both pair formation and courtship feeding by the European Robin are entirely distinct from courtship itself, although the repertoire of pre-nesting behaviour by migratory species is often compressed into so short a period that these events must appear virtually the same. Courtship, however, is a pattern of behaviour which typically immediately precedes or, at least, invites copulation. In well-established pairs courtship signalling is probably minimized, while it is doubtless more pronounced between individuals unfamiliar with each other, and for semi-practised ones it presumably falls somewhere in between. The following are some examples from among the Saxicolinae:

a) The Grandala male turns to the female, calling "fit-fidu", fanning the tail, bringing the wings forward jerkily to the sunbathing position, and then in increasing excitement tilts the wings forward, fluffs the rump, fans and depresses the tail, lifts the head and opens the bill as if begging, making dancing movements. The female usually approaches him from the front, walks around him in a semi-circle and flutters on top of him, the male then mounts, and the action terminates with some wing-spreading and tail-spreading by the male.
b) A male Blue Whistling-thrush flew low over the female's head while making excited buzzing noises, the tail fanned, repeating the manoeuvre twice, singing (untypically) all the time from low perches, and flew once more to hover over her, landing beside her in a very upstretched stance, the bill vertical. The female flew to a nearby horizontal branch, and copulation followed.
c) A male White-starred Robin clung to the side of a branch slightly below a perched female. He adopted an elongated posture, the neck outstretched, the bill in line with the body, and swayed slowly from side to side, displaying the throat star; he then flew across a gully over the canopy in slow flight, with fluttering wings and fully fanned tail, calling and then breaking into song as he landed.
d) The male Rufous Scrub-robin (*Erythropygia galactotes*) stands on an elevated point near the female, raising and lowering the tail, and slightly fanning the wings; the female copies this. He pursues her in low flight over the ground, sings and wags his tail up and down, and then flies slowly and gracefully with the tail fanned, repeating this display-flight several times until the female accepts him.
e) The male Rufous-capped Robin-chat adopts a hump-backed stance, the plumage sleeked, the tail lowered and fanned, the



*After they hatch, thrush nestlings are blind and virtually naked, but typically covered in straggly down along the usual passerine feather tracts. At first their powers of movement are limited, but almost immediately they can gape for food and produce a thin wheezy begging call. The offspring of this **Orange Ground-thrush** hatched a few days previously, as can be deduced by the fact that their eyes are open, and their bodies are covered liberally with down. At this age, they are capable of begging vociferously, forcing the parents to return ever more frequently with cargoes of worms and other invertebrate morsels.*

[*Zoothera gurneyi*, Vumba, Zimbabwe.
Photo: B. & L. Worsley/ Photo Access]



*In most of its range the **European Robin** produces a clutch of four or five eggs. A brood of six is therefore unusually prolific, falling just one short of the record! This adult is raising its ravenous sextet in a recess under uplifted roots in a German woodland. This site is fairly typical, but it is much more common for robins to hide their nests within dense creepers on walls or trees, a metre or so above the ground. They take to nestboxes, as long as they are open-fronted, and regularly nest in other man-modified situations. Female robins usually commence incubation with the last or second-last egg, thus ensuring a relatively synchronous hatching date for her brood.*

[*Erithacus rubecula rubecula*, Germany. Photo: Günter Ziesler]

wings held away from the body and vibrating as he dances to left and right on the perch, attempting to approach the female, while giving a fast quiet song of pure imitation (see Voice). He may make short fluttering butterfly-flights. The female droops her wings, and quivers her whole body. The male, with tail erect, lifts his wings square away from the quivering body. After copulation, he caresses his mate by stroking her under the throat with the back of his head, uttering soft fluting notes.

f) The Common Nightingale male sings quietly near the female, cocking and fanning his tail, sometimes drooping the wings, and then pursues her in whirring flight with bleating calls, lands beside her, and sings and dances while holding the head low, the tail fanned and the wings quivering and spread.

g) The male Indian Robin displays his white wing-coverts prominently during courtship. Occasionally he performs a courtship-flight, with the wing patches everted prominently, but most display is on the ground near the female. Here, he first makes a dancing, circling run, with the wings drooped, the tail down, the breast puffed out, the neck stretched up, and the bill vertical—the emphasis is on movement, not on colour; when close to her, he cocks the tail sharply, stands sideways, and fluffs and quivers the whole body— the emphasis is now on colour, not on movement, "a mere patch of black, white and chestnut of no definite shape"; copulation then follows.

h) The Common Redstart male moves with bee-like flight in a small circle around the female, uttering excited harsh calls; he perches near her, flattens the body, raises the wings until they touch over the back, and quivers them to show off the shimmering pink undersides; with the tail depressed and fanned, the body pressed down and along the perch, and the head lowered and stretched forward to show her his black face and white cap, he gives a very high soft hiss, copulates, and then moves off in wild rapid flight around the female, before flying away, warbling a sweet song.

i) A presumed male Spotted Forktail chased a presumed female and, when she landed, he scissored his tail with more exaggerated spreading of the outer feathers, then fluttered with shallow wingbeats over water close to her, with the white wing-coverts prominently fluffed out in a broad V-shape. He then perched on a nearby bush and sang a soft song.

Leap-frogging behaviour is a characteristic of some species, such as the Puaiohi during courtship. It is also performed by the Buff-rumped Wheatear (*Oenanthe moesta*) during a remarkable duetting display which has been thought to have a territorial function, but which must surely be associated with confirmation or strengthening of the pair-bond.

Among species that nest in tree-holes, the male apparently selects the sites and has special displays to attract its mate to inspect and use them. The male Common Redstart, for example, flies up to the hole, fanning the red tail conspicuously as he enters, and then perches in the entrance and "flashes" his white crown feathers, sometimes also gliding down to the hole with the wings and tail spread wide. The male Pied Bushchat flutters in front of potential crevices while the female looks on, and, after he has entered and left a crevice, she inspects it, the procedure being repeated several times at one site. In the case of Eastern Bluebirds, the male, while holding nesting material, perches face inwards at the cavity entrance, with drooped wings and fanned tail; he repeatedly looks around, and puts his head in the entrance, and he half-enters the hole; from inside, he sticks his head out, still carrying nest material, and afterwards he performs a wing-waving display next to the hole. The social pair-bond is consid-



*The **Black-eared Wheatear** builds a nest essentially similar to those of other* Oenanthe, *being a rather flat cup of stems and moss, lined with down or slender fibres such as hair, and sometimes surrounded by a platform of twigs. It is usually placed on the ground, under an overhanging stone or tussock, but sometimes in rocky cavities in the walls of ruins or wadis. In southern Europe it is often concealed on dry hillsides amongst aromatic herbs, such as lavender* (Lavandula) *and thyme* (Thymus), *as seen here. After incubating the eggs for 13–14 days, the chicks are fed for a further 11–14 days, on this occasion by a male.*

[*Oenanthe hispanica hispanica*, La Rioja, Spain. Photo: José Luis Gómez de Francisco]

ered established once a female enters the cavity with the advertising male. There is, however, some evidence that the female can at least discriminate between proffered options. Given a choice of two types of nestbox, female Mountain Bluebirds which had bred successfully in one type tended to select that same type, while those which had failed in one type of box tended to select the other type. First-time breeders chose nestbox types similar to the one in which they had been reared, suggesting that some form of imprinting or early learning influences adult nest choice, and that good or bad experiences drive later choices. This is mirrored in other patterns of adherence or aversion to nest-sites by thrushes.

The degree to which hole-nesting is obligate in this family is not clear, but it seems likely to be semi-facultative. Eastern Bluebirds are virtually obligate hole-nesters, but in the late nineteenth century, when they were unusually abundant on Bermuda, and perhaps where predation or brood-parasitism pressures were different, some pairs on the island abandoned cavity-nesting and, instead, made open cup-nests. Likewise, Common Redstarts are widely thought of as hole-nesters, but open cup-nests of this species have also been found. There is evidence to suggest that the hole-nesting habit of this saxicoline may have evolved as a defence against brood parasitism by the Common Cuckoo (*Cuculus canorus*), the females of which have difficulty in depositing their eggs properly in the hole, and the young of which have difficulty in evicting the host's offspring. Some wheatears and *Cercomela* chats can nest in relatively open crevices and cavities among roots or, alternatively, deep in holes of various types, including bee-eater (Meropidae) burrows, old hirundine nests and even, in the case of the Familiar Chat, an old chamber in a Sociable Weaver (*Philetairus socius*) colony.

On the other hand, hole-nesting has a serious drawback in the form of nest-site scarcity and, consequently, nest-site competition. Because tree cavities are often so few, especially in managed woodland where old trees are removed, many other species lay claim to the spaces. As an example, Mountain Bluebirds have to compete with Buffleheads (*Bucephala albeola*), Northern Flickers (*Colaptes auratus*), Tree Swallows (*Tachycineta bicolor*), Black-capped (*Parus atricapillus*) and Boreal Chickadees (*Parus hudsonicus*) and Northern House Wrens (*Troglodytes aedon*), as well as introduced Common Starlings (*Sturnus vulgaris*) and House Sparrows (*Passer domesticus*). Furthermore, there are American red squirrels (*Tamiasciurus hudsonicus*), deer mice (*Peromyscus maniculatus*) and least chipmunks (*Eutamias minimus*) offering serious threats to nest-site occupancy. The aggression of the bluebird can save the day, and a pair has been seen to force to the ground and drive away the larger, chunkier Northern Flicker, but it has little chance if caught on a nest at night by an animal with teeth. In addition to all of these other species, of course, the birds have also to deal with conspecifics. Aggression between female bluebirds, to prevent egg-dumping as much as eviction, is high, to the extent that severe wounding, maiming and even death are commonly reported. Egg-dumping is, however, a relatively minor problem, only 1% of bluebird nestlings being the offspring of conspecific brood parasites; it is probably carried out by fertilized females who have lost their own nests through predation or accident.

Turning to the cup-nesting species, it is assumed that the female selects the nest-site, given that there is so much greater choice, and because it is almost always the female alone who builds. Female Song Thrushes, for example, test possible sites, by squatting in them, rotating while holding the tail raised, and hopping around them. Nevertheless, Skutch reported a male Clay-coloured Thrush which chose the nest-site and actively assisted in the construction of the nest, sometimes sitting in it. Similar observations of male support, but not nest-site selection, have been made for the Mistle Thrush, the Common and Grey-winged Blackbirds, the Ring Ouzel, the American Robin, the Cape Robin-chat, the Red-backed Scrub-robin, the Pied Bushchat, the Little and Spotted Forktails and others, although male help, if any, is usually only occasional and desultory. An individual Sharpe's Akalat (*Sheppardia sharpei*), presumed to be a male, has been seen to collect material and to pass it to its mate for incorporation in the nest; similar nest-initiation behaviour, with male proferring the female a large dead leaf (the first layer of the nest), is seen in European Robins.

With these open types of nest, there is a conflict between the need for concealment, in order to prevent predation, and the need for a view, allowing the opportunity to see approaching danger and escape from it. Song Thrushes have been found to seek a compromise between these two requiriements, never placing their nests in the most concealed sites but selecting sites with intermediate density of vegetation. On the other hand, at least two thrushes have curious strategies in this regard. The first of these, the Pale-breasted Thrush, uses the same nest repeatedly, so that, with the repair and supplementing of material with each brood, the nest



Most ground-nesting turdids, especially those with open cup-nests, lay eggs which are dull, mottled, or otherwise camouflaged. The ***Whinchat*** *is an exception to this rule, its eggs being a beautiful pale blue, lightly speckled with reddish-brown, and remarkably conspicuous. On hatching, the nestlings are very light at only 2 g, but thereafter they gain around 40% of body weight with each passing day for the next five days. Maximum weight gain is around day 5, during which the nestling adds in the region of 3·5 g to its own body mass, depending on the provisioning rate.*

[*Saxicola rubetra*, Burgos, Spain. Photo: José Luis Gómez de Francisco]

itself can reach very large dimensions. The second species, the Grey Ground-thrush (*Zoothera princei*), places its nest in a highly visible position in the crown of a low understorey tree, where it is easily confused with the bunches of dead leaves accumulated by squirrels in tree forks. Even so, this did not prevent eleven of 13 nests in one study from being destroyed by predators.

Commonly with the male in attendance, partly as a mate-guarding behaviour, the female typically begins a cup-nest by constructing a platform of dead leaves, twigs and other material, building up coarse outer walls by weaving together stems, rootlets, moss and sometimes mud or leaf mould. She shapes the cup by making snuggling, rotating body movements, thrusting down the breast and gently flexing the feet, pulling the top edges of material inwards and weaving them down to make a smooth-rimmed, tight-fitting structure, which she then lines with fine material such as thin soft grasses, rootlets, animal hair and/or feathers. With regard to the lining, however, there is one notable exception. The Song Thrush creates a lining from mud, dung and, especially, dead wood and wood pulp, which dries to form a hard, smooth interior. The function of this plaster-like lining is uncertain, but a recent suggestion is that it enhances nestling survival by rendering conditions inside the nest unsuitable for insect parasites, mainly the larvae of botflies (*Protocalliphora*) and nestflies (*Neottiophilum praeustum*). The general nest-building process is essentially similar for hole nests.

Thrushes that breed close to human settlements commonly incorporate man-made material, such as bits of string, cellophane, sacking, paper, cotton wool and so on, into their nests. Several species, including the Littoral Rock-thrush (*Monticola imerinus*), the Rufous Scrub-robin, the Oriental and Madagascar Magpie-robins (*Copsychus albospecularis*), the Indian Robin and the Buff-rumped and Mountain Wheatears, frequently incorporate the sloughed skins of snakes into the structure. The elaboration of nests by such means is presumably part of an attempt to disguise them by making them appear as natural as possible, through the use of everyday material in the local environment. Some species add living moss to the outside of the nest in order to enhance this effect. If, in particular, the birds add mud to the nest to hold the structure together, the moss and certain seeds that are probably added by accident can take root and grow. Skutch found some Clay-coloured Thrush nests to be "living gardens" as a result, and the nests of such species as whistling-thrushes and forktails, placed in damp crevices where moss grows naturally, frequently have flourishing green cover in their walls. On the other hand, a female White-crowned Forktail was seen to gather moss and other building material from near a stream, carry it to the water and give it a very thorough washing, before taking it to the nest-site; these actions doubtless had a sanitizing purpose, although they may also have washed out organic matter that would have helped the material to root.

The nests of some ground-nesting species, such as the nightingales, can be domed. Indeed, shortwings make beautifully constructed domed nests, as difficult to spot as are the birds themselves. Various African and Asian chats of arid environments nest in rock crevices and in burrows in the ground, and they have some intriguing adaptations that appear to serve as anti-predator mechanisms. Several of the wheatears use sand rat (*Psammomys*) burrows in which to nest, and observations in Israel indicate that the relationship between the two animals can be "semi-symbiotic". A pair of Buff-rumped Wheatears will use one of many burrows in a colony of fat sand rats (*Psammomys obesus*), but returns the favour by serving as a guard: when a raptor passes over the area, the wheatear's warning call sends the sand rats scurrying back into their burrows. Also in Israel, studies of the Blackstart's remarkable rampart-building behaviour, in which it places hundreds of pebbles and stones at and around the entrance to the nest-cavity, led to the conclusion that ramparts probably serve as an obstruction or barricade which a potential predator must take time to negotiate, allowing the female a greater opportunity to escape. A similar habit is shown by other members of the genus *Cercomela*, including the Familiar and Brown-tailed Chats and the Brown Rockchat (*Cercomela fusca*), the last of which may use earth, and by some wheatears, including the White-crowned, Black, Hume's, Mourning, Mountain and Cyprus Wheatears (*Oenanthe cypriaca*). The Mourning Wheatear also uses pottery shards, the Mountain Wheatear utilizes caked mud or twigs, and the Cyprus Wheatear also uses twigs, often to a predominant extent. One painstakingly analysed Familiar Chat nest contained 361 stones and 15 nails, the latter 7·5 cm long, in addition to 250 miscellaneous fragments of nest material, and had a total weight of 1163 g. Another chat nest was augmented by 147 stones in a period of just three days.

This behaviour has also evolved independently in arid-country larks (Alaudidae), and one plausible explanation is that stone



Like the majority of its congeners, ***Townsend's Solitaire*** *nests primarily on the ground, usually in recesses in banks, or under jutting rocks, roots or stems. It lives in relatively dry coniferous forests from Alaska to Mexico and cannot depend on the ready supply of moss and flexible plant matter available to most of its tropical relatives. The result is that it builds a simple cup of twigs and stems, lining it with grass, strips of bark and pine needles. In the breeding season adults and young subsist on insects and their larvae. In winter, however, some populations survive on a diet entirely made up of juniper* (Juniperus) *berries.*

[*Myadestes townsendi townsendi*, north-west Montana, USA. Photo: Tom Ullrich/ Oxford Scientific Films]

aprons ameliorate the nest micro-climate by absorbing heat at midday. At least in the case of the Black Wheatear, however, the phenomenon has, as discussed earlier (see Morphological Aspects), transmuted into a test of male fitness. In a study of this species in southern Spain, one nest was found under which 9300 pebbles had accumulated over several years; the average weight of these was 6·8 g, the heaviest being 28 g, two-thirds the weight of the bird itself. The rate of collection is at least comparable with that of the Familiar Chat: in a series of 42 successive trips in a 25-minute period, the average time per trip, from leaving the nest to returning with a stone, was 24·7 seconds. Female Black Wheatears with mates that carry heavier loads appear to enjoy higher reproductive success, perhaps partly owing to the superior genes that they obtain for their offspring by selecting as mates males which are able to incur the heaviest burdens. On the other hand, females also contribute more to reproduction themselves when mated to a superior male, and correspondingly reduce their reproductive effort if the stone-carrying abilities of the mate is experimentally reduced by removal of some of its primary feathers.

Thrushes and chats are renowned for the unusual choices of nest-site made by some of the family's members. Whereas the more conservative and retiring species tend to be relatively inflexible in this respect, the typically bold and aggressive species often make decisions that reflect a dare-devil opportunism. Discarded tins, pots, oil-drums and cans are frequent choices by such turdids as White-throated and Cape Robin-chats. Rufous Scrub-robins in Turkey appear actively to prefer such sites over natural ones, so that refuse dumps can be good places to find this species, nests of which have also been found in tractor engines. Blackstarts have been recorded nesting in a vehicle exhaust, and a Familiar Chat bred in a constantly used customs road-boom. Lack reeled off a list of odd sites utilized by the European Robin, including a jam-jar, a letterbox, an old boot, a pulpit, a human skull, a dead cat, an unmade bed, and a gardener's jacket pocket. He also related how a pair built a nest in a wagon which, just after the young hatched, was moved 160 km and then returned, one of the parents accompanying it and feeding the young en route. Cyprus Wheatears have built nests in aircraft or in aircraft hangars next to roaring engines. Perhaps most astonishing, however, is the report by B. E. Smythies of Oriental Magpie-robins which built nests in the camera compartments of all six "Hurricanes" of "A" flight stationed at an airfield in Arakan, in Myanmar, during the 1939–1945 war. When the camera was removed from one aircraft after an operational sortie, a female was found to be incubating eggs in the nest, having remained there throughout the flight.

The time required to build a nest depends on conditions of weather and female physiology. Cold or wet spells can depress activity, while the state of female readiness to lay may both be driven by and drive the speed of nest construction, although there is almost always a gap between the completion of the nest and the laying of the first egg. Broadly speaking, turdid nests are usually completed in 3–6 days, but Oatley reports a remarkable feat by a Red-backed Scrub-robin, who built hers from scratch in eight hours, while the European Robin who used a gardener's jacket pocket almost completed her nest in less than four hours. Interestingly, the Common Blackbird has been found to build its first nest of the season in 7–11 days, whereas it takes much less time, sometimes as little as two days, to complete later ones. Over a period of 11 hours, a female Common Redstart took material to the nest 239 times, and Buxton calculated that a total of about 600 visits may be appropriate for a female building from scratch in a fairly standard cavity, although smaller cavities require smaller quantities of lining. He was astonished at the size of stick that a female could carry, and thought that some were maybe twice her own weight. Sometimes, the redstart found it difficult to get a large stick through the entrance; on such occasions, either she succeeded after a considerable amount of shifting the stick to one end of her bill or, often, she dropped it, yet then continued with the intended action and entered the hole.

Although the first egg is laid sometimes within a day of the nest's completion, there is more commonly a period of several days before laying begins. Even in the aforementioned case of the eight-hour nest built by the Red-backed Scrub-robin, the lag between completion and first egg was four days. This is the fertile period for the female, when she is most receptive to copulation. Male Western Bluebirds, for instance, attempt to copulate at a steady rate from 60 days before laying until the onset of incubation, but female acceptance of within-pair copulations increases to 80% only in the ten days before laying, and remains high throughout the laying period. It is also, therefore, the period when the male must guard his mate most intently. The strategy of the male European Robin is to sing loudly and strongly as a means of discouraging potential cuckolders from venturing near, whereas the male Common Redstart, in contrast, becomes relatively si-



*The **Spectacled Thrush** is a classic* Turdus*, usually building its bulky cup of grasses in low vegetation and feeding its offspring a diet of worms and other soft-bodied invertebrates. Likewise it often lines its nest with mud, a practice found in a wide variety of congeners. Females of many* Turdus *species collect damp mud and mould it into the cup of their nests with their bodies. The mud seems to function as a reinforcing agent, and probably helps to insulate the contents from low temperatures or heavy rainfall. In drier climates* Turdus *nests can often be identified long after the vegetable part has rotted away because a hard baked cup of mud survives. This Neotropical species lives on Caribbean islands, and in cleared areas of Venezuela, north Brazil and the Guianan shield, a humid region where nests presumably disintegrate shortly after fulfilling their function.*

[*Turdus nudigenis nudigenis*, Le Larivot, Matoury, French Guiana. Photo: Olivier Tostain & Tanguy Deville]



Unlike some birds, provisioning thrushes do not swallow food for later regurgitation at the nest. Instead, items are clasped between the mandibles, ready to insert quite roughly into whichever gaping maw presents itself most enthusiastically. Although food items are almost exclusively invertebrates, they sometimes include berries or other fruit, as can be seen at this nest of the ***Olive Thrush****. As with many tropical turdids, this species has a poorly defined breeding season, nesting in all months wherever meteorological conditions are relatively constant.*

[*Turdus olivaceus abyssinicus*, Nairobi, Kenya. Photo: Michael Gore]

lent and simply follows the female closely wherever she goes. This latter strategy, called "mate-guarding", is also adopted by the Common Blackbird, which typically perches above his partner, watching her and the immediate surroundings at the same time, and by the Common Nightingale, the Rufous Scrub-robin and the Bluethroat, and it is probably employed by the great majority of thrushes and chats. For the Western Bluebird, it has been shown that the male keeps closer to the female, and follows her more frequently, when nearest-neighbour distances are reduced, as may be expected if the threat of extra-pair copulation increases with local density, and, furthermore, inter-pair distance diminishes when vegetative cover around the nest increases, suggesting the importance of keeping the female in view at all times during this period.

Why does the male have to be so vigilant over his mate? The reason is that she *may* be trying to slip away to copulate with another male, and other males *will* be trying to slip in and mate with her. The explanation for these impulses lies in maximizing the quality, as well as the quantity, of an individual's genetic output. The process, already outlined in the preceding paragraphs, by which the Common Blackbird forms pairs over the winter results in assortative mating between individuals of equal quality; and from this circumstance arise sexual-selection pressures, driven by the mutually beneficial interest that high-quality males and low-quality females have in each other. Low-quality females, which are typically mated to low-quality males, have the chance to improve the genetic quality of their offspring by engaging in extra-pair copulations with high-quality males. High-quality males, although mated to high-quality females, have no reason to reject sexual contact with low-quality females, as they can, through them, increase their output with virtually no cost, since extra-pair males avoid participating in parental care.

This leaves the low-quality males and the high-quality females. The former may be interested in the latter, but the latter plainly have no interest in the former. Indeed, the evidence suggests that an older female herself seeks to prevent her mate from straying by prolonging the period of her sexual activity, so as, first, to induce her partner to guard her, which reduces sexual coercion from other males, and, second, to monopolize his parental effort, since the mate-guarding male cannot easily pursue extra-pair activity or search for better mating options. An interesting facet of this disparity in quality between individuals in a population is that females seeking to find a sire other than their mate for their offspring can be remarkably effective at doing so, even when males are being especially attentive in their guardianship. Among Eastern Bluebirds, for example, males that stayed closer to their females had *more* offspring of other sires in their nests than did those that were less attentive, probably because they were inexperienced young birds with relatively little certainty about the female fertile period. In the case of Bluethroats, old males are far less vigilant in their mate-guarding than are young ones, but, while they experience the same levels of cuckoldry as do the young birds, it is *only* the same levels, and not higher ones, and these older males gain a considerable number of extra-pair fertilizations of their own in compensation. In all these extra-pair copulations, the courtship procedure must be hugely truncated in repertoire and time, but male Western Bluebirds have been found to perform a special display, seen only in extra-pair encounters, in which they shivered or flipped their wings rapidly while tilting forwards, often gaping and giving a high "mew" call, all of which has been interpreted as a submissive display intended to deflect an aggressive response.

Quality in these terms is to some extent measurable in terms of age. Since most thrushes and chats that fledge will die before or soon after reaching the age of one year, or, in tropical areas, rather more, any individual reaching two or more years of age has demonstrated a certain quality of survival. This may be mere external good fortune, but it may also be the internal good fortune of good genes. Female thrushes and chats are programmed to search for evidence of quality in potential partners, but, if circumstances force on them a social mate of suboptimal (or simply unproven) quality, they will inevitably be receptive to, and commonly actively pursuant of, a neighbouring mate of clearly higher quality. Extra-pair sires are typically males of superior quality to the social mate, and hence may confer genetic benefits on the extra-pair offspring, either through the intrinsically superior quality of the sire or through his compatability with the female's genetic make-up. This has been very elegantly shown for Bluethroats, in which the immunocompetence of extra-pair offspring is greater than that of the mated pair's offspring in the same nest.

How do females assess the quality of potential extra-pair mates? In the case of Bluethroats, males which have had their

blue and chestnut throat patches experimentally darkened lose more paternity within their own nests, presumably since their attractiveness to their mates as a sire is diminished, and they spend more time in guarding their mates against extra-pair activities and less time in singing than do males with intact colour patches. This implies that females are more likely to pursue extra-pair copulations when mated to an "unattractive" male, and they appear to win this sexual conflict, as they indeed obtain more such copulations despite the greater guarding effort of their experimentally darkened partners. Exactly the same results were produced when the ultraviolet reflectance of the blue breast of the species was experimentally reduced. Moreover, the spectral purity of the blue throat feathers and the width of the chestnut band are positively correlated with paternity in the male's own nest. Further evidence of the role of these colour patches in the sexual behaviour of the Bluethroat comes from the fact that this is one of several species for which artificial leg-bands appear to influence mate choice. Blue and orange leg-bands mimicking the natural sexual plumage of the Bluethroat permit males to guard their mates less and to intrude more into neighbouring territories, although the effect is relatively weak. Female Bluethroats, however, strongly favour symmetrically coloured leg-bands over asymmetrically coloured ones, confirming a well-known preference among female birds for symmetry in males.

Degree of infidelity has thus far been investigated by the use of molecular-genetic techniques to determine biological paternity of broods, or by direct observation of marked individuals, for at least ten members of the Turdidae. These are the Eastern and Western Bluebirds, Townsend's Solitaire, the Common Blackbird, the American Robin, the Clay-coloured and Bicknell's Thrushes, the European Robin, the Bluethroat and the Northern Wheatear. Not one of these ten has turned out to be genetically monogamous. In Western Bluebird nests, 19% of the young were found to have been sired by a male other than the one provisioning them, and in nests of Clay-coloured Thrushes this proportion exceeds a third. One of the best-studied thrushes with respect to paternity is the Bluethroat, for which the degree of extra-pair paternity appears to vary enormously from one year to another. Thus, in a decade-long Norwegian study, the proportion of illegitimate young varied among years from 7% to 33%, and in one French study it reached as much as 42%. Annual variation in environmental conditions does not seem to predict this very well, although, in Norway, there has been some indication that infidelity is lower in years with colder morning temperatures, suggesting that, during harsher climatic conditions, the birds may be energetically more constrained to look after their own survival, rather than pursue extra-pair activities.

For males, there is a powerful tension between the need to guard the mate so as to prevent loss of paternity, which requires caution, vigilance and quiet, and the impulse to venture beyond the territory in order to gain paternity at the expense of a neighbour. With the Northern Wheatear the latter interest prevails at the start of the season, probably because there are fewer male contenders at that time, but later-arriving males are much more fixated on mate-guarding. Among many species, however, there are not only neighbours to contend with but also "floaters", males which have failed to find a territory or a mate and which are constantly on the surreptitious lookout for either or both. The pressure from this sector of the population, largely hidden to human eyes, can be gauged from the speed at which widowed females can remate. As an entirely typical example, a White-capped Water-redstart female, after her mate had been accidentally caught in a mousetrap, remated with a new male within the same day. Populations of the Northern Wheatear, in any one breeding season, can contain 5–26% unpaired males, and figures for other species indicate that such a male sex-ratio bias is widespread in the family.

Experimental removal of males from territories during the females' fertile period, as has been done with Eastern and Western Bluebirds, Northern Wheatears and European Robins, all resulted in rapid incursions and courtship of the females by neighbouring males, suggesting that even short lapses in mate-guarding can cause a male to lose a share of paternity. Females, however, remained selective: copulations occurred only if the males in question were in better body condition than were the removed partners, providing further evidence for the considerable role of female choosiness in the evolution of extra-pair mating systems. Interestingly, this circumstance, at least in the case of the bluebirds, did not result in less attentiveness to brood-feeding by the cuckolded males, even if the detention treatment allowed them to observe their females' behaviour, which suggests that, if they have assurance of at least some paternity, their response is to treat all offspring as putatively their own. Similarly, if a replacement male is present during his new mate's fertile



*Related to the nightingales, but more colourful and confident, the **Bluethroat** has been a focus for recent European studies of breeding biology. As with many birds, close scrutiny of an essentially monogamous system has revealed complex breeding systems and extra-pair copulations to be rather more frequent phenomena than previously believed. In most populations 5–15% of breeding units are polygynous, and anything between 33% and a staggering 64% of fledged young are sired by extra-pair males. The female, by no means an innocent party, has a habit of sneaking into neighbouring territories during the fertile period!*

[*Luscinia svecica cyanecula*, Palencia, Spain. Photo: José Luis Gómez de Francisco]

period, he will feed all offspring as if they were his; if he is not present, he usually takes no part at all in feeding them. It should be noted, incidentally, that, when a female is the new partner, the situation is rather different: she removes nestlings if they are less than a week old, disregards them if they are 1–2 weeks old, and actively feeds them if they are older than this and therefore on the point of fledging.

This all-or-nothing strategy by males helps to account for the particularly extraordinary situation to be found with Bicknell's Thrush, many nests of which have not just multiple paternity, but also multiple male feeders. During a demographic study of this species in Vermont, each of 14 broods was observed to be fed by groups of 2–4 males and one female, while the four remaining broods were each fed by a conventional pair. Three males fed the broods of two females concurrently or consecutively. Genetic analysis, using micro-satellite markers, revealed multiple paternity in nine of 13 broods, and four males had offspring in more than one brood in the same year. Ten of 17 males sired offspring in the broods that they fed, and ten of 13 sires fed the broods in which they sired young. Females fed nestlings more than twice as often as did males. On the breeding grounds, the males of this species range more widely than do the females, having home ranges of 4·5 ha on average, compared with 2·3 ha for females. Individual male home ranges contain up to four nests and overlap extensively with those of 2–7 other males, often intersecting near nest-sites, whereas female home ranges tend to overlap very little. Nothing quite like this is known to occur among any other of the Turdidae, and it is all the more remarkable for being found in so poorly differentiated a species. It has been suggested that the phenomenon is driven by food abundance in this thrush's relatively harsh environment. In one year, the number of male feeders at nests was significantly negatively correlated with prey biomass: in other words, females mated with more males in order to obtain food for the young from within their several home ranges.

Most thrushes and robins breeding north or south of the tropics exhibit a marked seasonal breeding pattern, so that their nesting endeavours cluster into a period of a few months. This happens to a lesser degree in the tropics, although there is a frequent correlation between breeding and the rainy season, which often results in two peaks of breeding activity. In Central America, the Clay-coloured Thrush has one extraordinary surge of breeding activity, timed in response to the rainy season, to the extent that the local inhabitants dub the species the "rain-caller". So sudden and synchronized is this breeding wave that it brings with it an unconventional behavioural pattern akin to that of Bicknell's Thrush. In an intriguingly lek-like arrangement, males sing in close proximity to one another, defending territories which may constitute only a single tree, and females may mate with several of them; over half of all females produce broods with mixed paternity, and 38% of young are fathered by a male other than the one looking after them. As this phenomenon becomes more fully explained, it may be possible to examine the evolutionary circumstances of a more southerly congener, Lawrence's Thrush, which also appears to lek by using its remarkably mimetic song (see Voice). What hidden aspect of this species' ecology can account for such an anomaly?

Among the thrushes and chats, the female usually lays one egg per day, mainly in the morning, until the clutch is complete, but longer gaps are common in tropical species, with as many as 60 hours passing between the laying of the second and third eggs in the nest of the Cape Robin-chat. Clutch sizes vary with latitude, clutches of 1–3 eggs being laid by many tropical and southern temperate species, the number increasing to 4–7 in northern temperate latitudes. This pattern persists among species having both temperate and tropical ranges. Thus, the Mourning Wheatear has a clutch size of 3–6 in north Africa, but this reduces to 1–3 in Kenya. The Common Stonechat lays 4–6 eggs north of the Sahara, but in tropical Africa it lays 2–5, and in southern Africa, as the climate becomes more seasonal and temperate, the figure increases somewhat again; the mean clutch size in Kenya is 3 eggs, and in southern Africa 3·2. Similarly, the White-starred Robin lays two eggs in areas north of the River Zambezi, but three eggs south of it. Eight eggs appears to be the maximum for the Turdidae within normal limits, and is recorded for the Mountain Bluebird, the White-throated Rock-thrush (*Monticola gularis*) and the Northern Wheatear. Fieldfares have been used experimentally to demonstrate that, above a certain number of eggs, hatching success decreases, probably owing to the inability of the incubating bird to cover and tend the eggs efficiently.

Lower clutch size implies either greater longevity of the species or greater parental investment, or both, since limited resources enforce a trade-off between survival and reproduction. In which



Although the true origins of Catharus *thrushes are Neotropical, certain forms, such as the* ***Veery****, shift northward to breed and only return in the non-breeding season to their ancestral home. By adopting this strategy they make use of the seasonal flush of resources that typifies the temperate zone. Veeries nest near the ground in shady spots, usually in shrubs or low saplings, and often in woodlots or patches of disturbed forest with dense undergrowth. They are declining in North America's increasingly fragmented landscape, where they suffer elevated brood-parasitism and heavy losses to predators.*

[*Catharus fuscescens fuscescens*, New York, USA. Photo: C.H. Greenewalt/ VIREO]



The only African scrub-robin to extend as far north as Europe and Asia is the ***Rufous Scrub-robin****. Small numbers breed in the vineyards, citrus orchards and olive groves of Spain and Portugal, where this photograph was taken. The active nest depicted is placed in a classic location, the crotch of an olive tree* (Olea europaea)*, and contains a slightly below-average brood of three half-grown young. These are dutifully attended by the adults, both of whom, in a manner which can be taken to symbolize the richness of the Iberian summer, have arrived simultaneously with food.*

[*Erythropygia galactotes galactotes*, Portugal. Photo: M.D. England/ Ardea]

of these two areas an individual's best interests lie at a given point in life is strongly related to geography. Tropical species typically show a slower pace of life, in which adults favour their own survival over a faster rate of reproduction, as reflected in their small clutch sizes and high survival rates; for example, annual survival of White-browed Robin-chats and White-chested Alethes in Malawi is 83% and 87%, respectively, compared with 39–67% for various considerably larger European *Turdus* thrushes. Reduced clutch size in the tropics has been explained by the lack of a seasonal boom in food supply, so that parents are limited to rearing smaller broods; but small clutches may really be a strategy to ensure long life, since, if nest-predation risk is high, the parents will do better to spread their breeding investment over a longer period by reducing their seasonal fecundity and prolonging their own lifespan. V. Ferretti and her colleagues tested these alternative hypotheses by comparing food limitation and nest predation in two populations of Rufous-bellied Thrushes in different parts of Argentina, which differed with regard to clutch size. This revealed that food limitation, as reflected by the fact that nestlings grew slowly and commonly starved to death, was actually greater in the population with larger clutches, even when clutch sizes were experimentally equalized, implying that food limitation cannot account for these differences. In contrast, predation rates provided a very good explanation for the observed pattern: the population laying smaller clutches experienced higher rates of nest predation, as well as exhibiting various other aspects of behaviour associated with greater predation, such as lower rates of parental visitation to the nest, and faster nestling growth. A high rate of offspring mortality caused by predation, therefore, probably acts, in combination with long adult life permitted by relatively benign, aseasonal conditions, to make small clutches the most productive strategy in the tropics and southern temperate latitudes.

The difference that the presence or absence of seasonality can make is apparent from the amount of time spent with the fledged offspring by parent Common Stonechats in temperate Europe, as against tropical Africa. The post-fledging dependence period in African pairs, which do not have second broods, is 3–4 months. In Europe, in the case of first broods, it is often merely 3–4 *days*, at least so far as the female is concerned; the female then starts to build another nest for a second brood, although her mate feeds and cares for the newly fledged offspring for a further 5–10 days before leaving them to fend for themselves. Interestingly, while the difference in clutch size between tropical and temperate Common Stonechats has been shown to be genetic, the difference in number of broods per year is environmentally determined.

Ground-nesting species usually have cryptically coloured eggs in brown, grey and olive, open-cup tree-nesting species have bluish to greenish eggs with dark speckling and clouding, cliff-nesters have speckled or plain pale bluish or whitish eggs, and tree-hole nesters have plain white or, more rarely, pale blue eggs. Thus, the more exposed eggs need the more camouflaging colours and patterns, while the more concealed ones need to be visible to the nesting bird for their own security. These differences in egg coloration conform to a wider pattern among birds in general, as do the phenomena of reduced clutch size with season and of reduced clutch size and nestling period with openness of nest position. For example, the Common Redstart has a mean first clutch of 6·24 eggs and a mean second clutch of 5 eggs, and such hole-nesting species, probably owing to lower rates of nest predation, tend to have larger clutches than do open-nesting ones and their chicks tend to stay longer in the nest.

Incubation normally starts only after the full clutch has been completed, although Common Blackbird eggs generally hatch in the order in which they are laid. During egg-laying and before the start of incubation, a female may, particularly in wet weather, cover an incomplete set of eggs and, indeed, commonly roost on the nest, as has been recorded for the Common Redstart. She does not then apply her brood patch to the eggs, which remain cool, although, presumably, the earlier-laid eggs develop very slightly more than do the later-laid ones. The female can, however, make subtle adjustments which more strongly affect the hatching regime, by beginning to incubate before the last egg is laid. This happens with large clutches and late clutches of Common Blackbirds, resulting in greater hatching asynchrony and greater nestling-size hierarchy, the latter being an important cue for optimal parental investment in environmentally constrained circumstances.

In the great majority of cases, it is the female alone that incubates. Deviations from this condition exist, but they generally appear to represent unusual circumstances within particular species, as was the single instance of incubation by a male Cape Robin-chat. Reports of a more constant male participation in in-





*A saxicoline chat with thrush-like proportions, the **Blue Rock-thrush** occupies a wide range from the Mediterranean basin to the eastern archipelagos of Japan and the Philippines. In most regions it is a bird of crags, ravines, quarries and sea cliffs, where it either nests on ledges or in cavities, generally 2–5 m above the ground but sometimes high up on vertical precipices. The nest itself is a shallow structure, loosely constructed of rootlets and twigs, and lined with a few shreds of grass, feathers and downy plant material. After hatching, both parents feed the nestlings a diet of invertebrates, including soft-bodied and tough-shelled varieties, for a period of 15–18 days, after which the brood fledges. In Italy this species is common in craggy limestone hills and coastal regions, making use of castles and churches in rural valleys, as well as tall buildings in certain cities, including Rome. In spreading to these man-made structures and habitats it has adapted to nesting in stone buildings, as depicted so clearly in these photographs.*

[*Monticola solitarius solitarius*; Sonnino, Latina, Italy. Photos: Roberto Ragno]



Like all passerine birds, nestling thrushes and chats produce their droppings in a firm package. They are programmed to excrete these faecal sacs directly after a feed, so that the adult is present to deal with the situation, as demonstrated by this ***Black Redstart****. Genetically speaking, this taxon is very similar to the sympatric Common Redstart* (Phoenicurus phoenicurus)*, but it differs ecologically, avoiding woodland and preferring instead to nest in rocky places, often including buildings; this photograph shows an unusually open site. Hybrid pairs produce fertile offspring, but the two forms are maintained separate by their radically different habitats.*

[*Phoenicurus ochruros gibraltariensis*, France. Photo: Collection J./ PHONE/Bios]

cubation, as with the Blue Whistling-thrush, the Cyprus Wheatear and the Orange Ground-thrush, require fuller investigation and documentation. Often, however, males will feed incubating females on the nest. This is well documented for Townsend's Solitaire, Swainson's Thrush, the Bassian Thrush, the Spotted Forktail and many others. The incubating female Townsend's Solitaire occasionally exhibits "tremble-thrust" behaviour in which she stands in the nest, and thrusts her bill to the bottom of the cup among the eggs, simultaneously shaking her body conspicuously and sometimes flapping her wings. The function of this behaviour, which is also performed by the Eastern Bluebird, is unknown, but it may shake parasitic larvae from the nesting material.

Female Common Redstarts observed by Buxton incubated for about 75% of the day, taking short breaks 2–3 times hourly. Spells of incubation would last for 12–45 minutes, whereas breaks lasted for only 6–16 minutes. This pattern appears to be largely typical for the family, at least in temperate regions. Skutch watched a female Clay-coloured Thrush during one morning and reported her as incubating for 74·4% of the time, with spells of incubation of 34–84 minutes and breaks of 11–28 minutes; another female followed a similar regime, except that it included a stint of 188 minutes of continuous sitting, this on the tenth day after incubation began. During breaks in incubation, a female Common Redstart can very quickly find all the food that she needs. She seldom travels farther than 30–40 m from the nest, often indeed foraging in the canopy or at the foot of the nest tree itself, but she also then takes the time to preen and scratch, to maintain her plumage in optimal condition. The male's role during the incubation period, meanwhile, is to protect his mate and the nest through vigilance against potential predators, and he often acts as an escort and an usher during her breaks from the nest. Nevertheless, the fact that, among Common Redstarts, at least, the male sings better at this time than at any other suggests that he is advertising himself to any other females in the vicinity as a worthy genetic father.

Incubation periods are fairly uniform across turdid taxa, 11–15 days being the general span. The average period for the European Robin is 14 days, for the Song Thrush, the Common Redstart and the Hawaiian population of the White-rumped Shama 13·5 days, for the Common Blackbird, the American Robin, the Cocoa Thrush and the Wood Thrush 13 days, for the White-throated Thrush 12·5 days, and for the Veery and Bicknell's and Hermit Thrushes 12 days. Individual variation can, of course, be considerable. Common Redstarts, for example, have been recorded as incubating for 10·5 days and for 17 days, and the range for Common Blackbirds is 9–18 days. Longer periods can easily be explained by factors such as disturbance and poor weather, which may prevent the female from incubating or from maintaining a relatively high temperature for the eggs. Shorter periods presumably reflect an unusual degree of competence on the part of the incubating female, needing less time off the nest to forage or preen, but are probably also related to very favourable weather conditions. They also feature among hole-nesting species and those with higher rates of nest predation (see below).

Eggs pip and crack in typical avian manner, the hatching process usually taking less than 24 hours. The parent bird, usually the female, removes the eggshells. For the first few hours of life, Common Blackbird nestlings may be fed with saliva by the female. The male may discover the hatching of the young by direct observation, rather than by behavioural cues from the female; a male Common Redstart was seen to hover in front of a nest-hole, turning his head to squint into the darkness. Alternatively, he may find out indirectly, by observing the female carrying eggshells, collecting food, and so on. Sometimes, he may at first be kept from the nest by the female, although she soon requires him to supply food while she broods the chicks. She does this intensively in the first 3–4 days after hatching, but gradually, as the young develop feathers and thermoregulatory capacity, she reduces the amount of time she spends in this activity until, by 8–9 days, she broods only at night or in poor weather. By day 11, shortly before fledging, even nocturnal brooding may be discontinued.

Among the majority of the Turdidae that have been studied, from the Common Blackbird to Swynnerton's Robin, males deliver most of the food consumed by the nestlings, but, as the chicks' need for brooding diminishes, so the female begins to contribute more in this regard. The male often continues to be the major provider, as he visits with food both when the female is



*Having collected the extruded faecal material from one of its nestlings, this male **Blue Rock-thrush** is carrying it hastily away. He will drop it some distance off, where it cannot foul the nest cavity. For breeding birds the advantage of hygiene begins with disease control, but it does not end there. Cascades of bright white droppings and stinking guano may not be costly for breeding raptors and seabirds, but for a thrush they spell disaster. Predators hunting by sight or smell, such as the rats likely to be lurking in this Spanish barn, would hardly miss an insalubrious nest, nor skip an easy meal.*

[*Monticola solitarius solitarius*, Huesca, Spain. Photo: Ricardo Vila]

present and when she is absent, in the latter case feeding the young directly. When his mate is at the nest, he passes the food to her and she either distributes it to the young or eats it herself. Unsurprisingly, feeding rates increase as the nestlings grow bigger. Feeding rates of Swynnerton's Robin increase from 57 nest visits in the first three days of the nestling period to 135 visits in the last three days. The Cape Robin-chat makes six visits per hour per chick for the first 4–5 days, the number then rising to eight visits per hour per chick, with most visits in the early morning and late afternoon and fewest at midday. Feeding rates probably vary with quality, quantity and accessibility of food. In observations of Common Redstarts, food-delivery rates were highest around sunrise in one study and highest around noon in another, suggesting different activity patterns by the insect prey species. In terms of prey quality, caterpillars, being large, protein-rich, soft-bodied and easy to capture, are probably optimal; in contrast, flies, for example, are both smaller-bodied and harder-bodied, and are energetically costlier to obtain. Growth rates of chicks could be affected by the quality of the food brought to them and its required handling time, and by the predation risk that they incur (see below).

Loss of or desertion by one of the parents at the nestling stage places considerable stress on the remaining adult. A male Pied Bushchat in this situation managed to rear two of three nestlings to fledging, but it took him 18 days, rather than the normal 13–15 days. Eastern Bluebird females whose mates were experimentally removed also coped, but overall they had lower nesting success than did neighbouring pairs, and early in the season they were unable to provide sufficient food to raise any young to fledging. One of the most notable work rates on record is that of a female Common Redstart who was compelled to feed her chicks without the male's help; on day 13 after hatching, she provisioned her brood 419 times in 16·5 hours, equivalent to feeding each chick 70 times in the day. The evidence suggests that, although there may be some "heroic" achievements by single parents, in general both parents are needed in order to maximize reproductive output; mate desertion in favour of another partner at the nestling stage is, at any rate, virtually unknown in this family.

Studies have revealed that, each year, some 10% of Eastern Bluebirds die in the nest-hole as a result of starvation, exposure or abandonment. In the United Sates, prolonged, unseasonal cold rain in South Carolina on 9th May 1992 caused 100% loss of all nestlings more than one week old; the females were apparently unable to keep them warm enough or well fed, but younger chicks survived.

On hatching, the chicks are blind and virtually naked, with very sparse pale down in the usual passerine areas. Although their powers of movement are extremely limited, they can, of course, vocalize, with a thin begging call, and gape widely to receive food. Nestlings of *Turdus* species in tropical regions have less down than do those in temperate ones, presumably in response to elevated all-day temperatures. By days 4–5 the nestlings begin to open their eyes, although generally they do not keep the eyes open until about the seventh day and in some cases the eyes may remain closed until the ninth day. It is at around days 4–5 that the chicks begin to respond, by begging and gaping, to the sound of an approaching parent. American Robin nestlings have been found to compete for position in the nest according to their degree of food stress and the predictability with which a parent will perch on one sector of the nest rim, and some such behaviour doubtless applies to all Turdidae and, indeed, to most avian species. At around days 5–6 the primaries begin to emerge, followed some

two days later by the crown feathers and rectrices. By the eleventh day the nestlings are largely covered by feathers and ready shortly to fledge, but the yellow gape-flanges at the commissure are still very obvious. Weight gain by Whinchat nestlings, which weigh 2 g on hatching, is approximately 40% in each of the first five days, with a maximum recorded gain of 3·2 g on day 5, falling thereafter to 5–15% per day and reaching a fledging mass of 17–19·5 g. Although growth can be retarded by lower levels of food provision, it cannot be accelerated by overfeeding, as has been demonstrated for the Song Thrush. This is because the physiological and anatomical constraints are too great. Nevertheless, heavy nestlings of the Common Blackbird are more likely to survive to adulthood than are lightweight ones.

Fledging is semantically problematic, at least in the case of cup-nesting species. Typically, it means the developing of sufficient feathers to be able to fly, and for altricial birds it is, generally, coincident with departure from the nest. The young of cup-nesting thrushes and chats, however, often leave the nest before their flight capacity is adequately developed. Each spring, the suburban backyards of Europe are filled with the wheezy squawks of "semi-fledged" Common Blackbirds, stranded in the flowerbeds at the mercy of the neighbourhood cats. The Seychelles Magpie-robin almost became extinct on Frégate owing to this phenomenon. In these contexts, the behaviour appears remarkably maladaptive, but it clearly evolved as a means of reducing the risk of predation that every nest, and in particular every open nest, runs. Nestlings of certain species of scrub-robin have been reported as clambering around in the vegetation next to the nest before they are fully ready to leave its shelter, and the Red-backed Scrub-robin, apparently in response to unusually high rates of nest predation, has a nestling period of 11–12 days, notably shorter than that of its congeners, such as the 14–15 days of the Brown-backed Scrub-robin; moreover, its newly fledged youngsters are agile fliers at this stage, when the older Brown-backed are still incapable of sustained flight. Across passerine species in general, growth rates tend to be faster and nestling periods shorter among species which suffer heavier predation rates. For example, Veery chicks, with a 55% predation rate and an 11-day nestling period, grow considerably more rapidly than do those of the congeneric and similarly sized Swainson's Thrush, which incur only 35% loss and have a nestling period of 13 days. Similarly, the nestling period of the Eastern Bluebird, in which an average 49% of nests are predated, is some 3·5 days shorter than that of the slightly larger Western Bluebird, which suffers only 30% predation. Young bluebirds that leave the nest before they can fly are capable of climbing up trees, and this ability survives into adulthood and is employed by adults grounded and sodden by rain.

For many species, the act of leaving the nest is asynchronous. In the case of the Common Redstart, two days may pass between the exit of the first chick and that of the last. In these situations, one parent attends to the young in the nest, and the other tends those outside it. Brood division is probably widespread in the family, but its prevalence depends on local circumstance. It has been documented in detail for the Bluethroat, the Common Blackbird and the Wood Thrush and recorded for many other species, and this spatial dispersion of the young probably reduces both predation risks and foraging costs. The post-fledging dependence period in the Turdidae is highly variable, being influenced partly by latitude, as noted above for the Common Stonechat, and partly by the number of broods reared in a season, but in the great majority of cases it lasts between ten and 25 days. When a subsequent brood is initiated, the female may relatively rapidly abandon her existing offspring to the care of her mate while she builds a new nest. This can often occur less than a week after the young have left the nest, so that they are still far from competent and only just beginning to forage for themselves. The onus on the male to tend the offspring commonly lasts for a further three weeks while the female builds a new nest, lays a fresh clutch and incubates the eggs until hatching. Sometimes, however, the female will save time and reuse the previous nest, and the female White-crowned Wheatear may make a second nest and begin laying even while the first brood is still in the nest.

Juvenile Eastern Bluebirds acquire 50% of adult foraging efficiency after two weeks. Thus, whereas adults have a 67% success rate in taking terrestrial arthropods, two-week-old fledglings manage only 32%. In the following week, while they are still dependent, this efficiency presumably rises to a secure level.

Predation is the major cause of nest failure among thrushes and chats, as it is for most, if not all, passerines. One study of the Common Blackbird, for example, revealed a nest-predation rate of 5% per day at the egg stage. There are many types of nest



*The brood of this **Mistle Thrush** is approaching fledging time. "Fledging" refers to the completed growth of the feathers, but in practical terms the common way of measuring it is through the bird's first flight out of its nest. However, just to complicate the equation further, young turdids habitually leave the nest a few days before they can fly. They scatter in different directions, flopping about with useless wings and begging loudly from dense undergrowth. In so doing they seem to make themselves highly vulnerable to predation, but early fledging must have its adaptive merits. It is perhaps most easily understood as a hedging of bets, as predators will usually find one "squab" at a time, rather than a whole nestful at once.*

[*Turdus viscivorus viscivorus*, Calzada de Oropesa, Toledo, Spain. Photo: Jorge Sierra]



*After its progeny abandon the nest, this adult **Russet-tailed Thrush** will probably take responsibility for one fledgling, while its partner will feed the other. This phenomenon is termed "brood division", a partitioning of responsibilities that is common in thrushes and chats. Thus provisioned, the two fledglings will probably remain dependent for between 10 and 25 days, but the exact duration of this period varies with latitude (being much longer in the tropics) and parental intentions (being truncated if another nesting attempt begins).*

[*Zoothera heinei heinei*, Lamington National Park, Queensland, Australia. Photo: Roger Brown/ Auscape]

predator. Corvids such as crows and magpies are among the most familiar and problematic in many parts of the western world, particularly in suburban areas, but snakes and such mammals as racoons (*Procyon*) are far more important in some habitats, including forests. Large terrestrial snakes, such as Cape cobras (*Naja nivea*), are able to descend the often lengthy entrance tunnels of Southern Anteater-chats and other burrow-nesting chats, and cause heavy losses. Seemingly innocuous and endearing squirrels and chipmunks can also be particularly damaging. In the USA the southern flying squirrel (*Glaucomys volans*) is a major predator of Wood Thrush nests, and in parts of Europe Common Blackbirds suffer losses largely to the red squirrel (*Sciurus vulgaris*). Townsend's Solitaire nests, which are placed on the ground, are hit mainly by squirrels and skunks (Mephitidae), and the appearance of a rodent within 30 m of the nest elicits vigorous "wing-stretch displays" and "floppy flight displays" which commonly result in the potential predator's retreat. African chats can be particularly aggressive and fearless towards potential nest and nestling predators, including snakes, and the Familiar Chat is among the few turdids to be recorded as performing distraction displays. Nothing, however, is likely to deter the black bear (*Ursus americanus*) from its depredations of Wood Thrush nests and even Eastern Bluebird nestboxes. At the other end of the scale are seemingly random acts of destruction performed by other small birds, most notably the Northern House Wren, which punctures or removes eggs in Eastern Bluebird nests in such quantity as to account for, in one study, a third of all nest failures.

Researchers monitoring nests need to exercise great care, as some predators can use the smallest cues to detect a nest. In one study of White-starred Robins, the success rate of eleven pairs whose nests were inspected by a careful researcher was still significantly lower, at 18%, than that of 32 pairs with unchecked nests, which had a success rate as high as 78%. There is also the phenomenon of "meso-predator release" to contend with. Thus, in South Africa, nest predation by monkeys has been judged an important factor in the demise of the globally threatened Spotted Ground-thrush in the fragmented coastal forests, where monkey populations are thought to have increased following a reduction in the density of Crowned Hawk-eagles (*Stephanoaetus coronatus*), the primate's principal predator.

In recent years, biologists studying various northern thrushes have detected a phenomenon by which elevated levels of nest predation result from population peaks in certain rodents. Bicknell's Thrush suffers higher nest predation in years when cone crops of conifers are high, which generally occurs every other year, since the density of squirrels increases in such years; in low crop years, the species' breeding success is considerably higher. Similarly, Veeries experience very poor breeding success in acorn mast years, when rodent populations burgeon, since the rodents prey on nests while their predators, the raptors, also kill adults and juveniles. On the other hand, populations of Common Redstarts in northern Finland fluctuate negatively with the vole (Microtinae) cycle, because small-mammal predators switch to taking birds when vole numbers are low. Likewise, in Bialowieza



*As might be expected in a family for which premature fledging is the norm, young juvenile turdids have powerful begging and distress calls. In general, their plumage is also distinctly speckled, providing camouflage when they are at their most naïve and vulnerable. Some, including the **Eastern Bluebird**, can even clamber to safety up tall trees well before they can fly. Having benefited from these traits, this fledgling appears to be well on its way to independence, representing a successful contribution to the gene pool for the provisioning male, if indeed he is the father; around 20% of this species' chicks are produced by extra-pair copulations.*

[*Sialia sialis sialis*, Hamden, Connecticut, USA. Photo: Jim Zipp/Ardea]



Thrushes and chats that build open cup-shaped nests are often heavily persecuted by brood parasites. Having evicted the rightful occupants, this juvenile Red-chested Cuckoo (Cuculus solitarius) *is swaddled in the nest of a* ***Cape Robin-chat****, where it will receive the undivided attention of both adults. This type of parasitism results in substantial reproductive effort by the nest-builders, coupled with a complete elimination of reproductive success, a twin cost so severe that many turdids have learnt to be very choosy about odd-looking eggs. It possibly also explains the repeated evolution of cavity-nesting in the family.*

[*Cossypha caffra caffra*, Somerset West, Western Cape, South Africa. Photo: J.J. Brooks/ Photo Access]

Forest, in Poland, predators kill four times more nestling Common Blackbirds in years when rodent numbers are low than in a year when they are high, and in a year with high caterpillar numbers smaller predators left more eggs of this species untouched. In a remarkably complex circumstance, colonial-nesting Fieldfares in Sweden were found to suffer lower rates of nest predation than were those that nested singly, probably owing to the collective raptor-mobbing ability of the species, but colonial nesters depleted the local food resources more rapidly than did solitary pairs, leading to more nestling starvation. Futhermore, colony size of Fieldfares is affected by mortality of adults, which suffer higher predation from Tawny Owls (*Strix aluco*) in more conspicuous, larger colonies. Hence, in northern Sweden, where Tawny Owls are absent and 24-hour daylight during the breeding season allows better nest defence, average colony sizes are larger than those in southern Sweden. In a Norwegian study, however, although the risk of avian predation was confirmed as a reason for colonial nesting, the factor driving solitary nesting was nest predation by mustelids following the crash of rodent populations.

The unique mobbing behaviour of Fieldfares involves the use of directional defecation. The birds fly up to, or behind, a potential predator in a rapid attacking movement, but then brake and swerve upwards, letting loose a stream of sticky faeces that hits the predator. The effect of several such attacks can be devastating, since the faeces clog the feathers of a raptor or crow and render flight difficult or even impossible for it. The use of this technique is equally strong against flying or perched birds, but it is ineffective against mammalian predators.

Curiously enough, however, another trick of the Fieldfare is to focus its colonies around an avian predator such as a Merlin (*Falco columbarius*), as raptors tend not to hunt close to their own nests but do, on the other hand, display levels of aggression towards potential predators that serve as an "umbrella" for the thrushes. Individual pairs of Groundscraper Thrushes in Africa do the same thing: they nest close to pairs of Fork-tailed Drongos (*Dicrurus adsimilis*), which are notoriously intolerant of potential nest predators.

Brood parasitism is another danger to nesting birds. In the New World, the parasites are various species of cowbird (*Molothrus*), and in certain parts of North America where fragmentation of habitats is extreme, and cowbird densities high, the impact of brood parasitism on *Catharus* thrushes has been a cause for concern, particularly with the Veery (see Status and Conservation). In the Old World, various species of cuckoo take their toll. The Orange Ground-thrush is occasionally parasitized by the Jacobin Cuckoo (*Clamator jacobinus*), the Lesser Shortwing and Blue Whistling-thrush by the Large Hawk-cuckoo (*Cuculus sparverioides*), the White-browed Shortwing by the Asian Lesser Cuckoo (*Cuculus poliocephalus*), the Siberian Blue Robin by Hodgson's Hawk-cuckoo (*Cuculus fugax*), and the White-throated Rock-thrush, White-tailed Rubythroat, various *Phoenicurus* redstarts, the Plumbeous Water-redstart, various *Saxicola* bushchats, the Northern Wheatear and the Spotted Forktail by the Common Cuckoo. Similarly, the White-starred Robin, Bearded Scrub-robin, Kurrichane Thrush (*Turdus libonyanus*), Cape Rock-thrush, Common Stonechat and various *Cossypha* robin-chats are parasitized by the Red-chested Cuckoo (*Cuculus solitarius*), the White-starred Robin once also by the African Emerald Cuckoo (*Chrysococcyx cupreus*), and the Kalahari and Karoo Scrub-robins are victimized by the Diederik Cuckoo (*Chrysococcyx caprius*), the Forest Robin (*Stiphrornis erythrothorax*) probably by the Dusky Long-tailed Cuckoo (*Cercococcyx mechowi*), Sharpe's Akalat by the Barred Long-tailed Cuckoo (*Cercococcyx montanus*), and the Chestnut-naped Forktail by the Brush Cuckoo.

The Red-chested Cuckoo's parasitism of *Cossypha* has long been a source of bafflement, as its egg is non-mimetic. It turns out, however, that this cuckoo's egg closely resembles those of the Cape Robin-chat in the ultraviolet part of the spectrum, invisible to human eyes but not to the eyes of the birds.

Conspecific brood parasitism, although very poorly documented, probably occurs widely among Fieldfares and Redwings. In one study, 11·5% of Fieldfare nests held an egg laid by a female other than the resident. There is even a documented case of a Fieldfare laying an egg in a Redwing nest. Redwings reject unfamiliar eggs, and in experiments they attacked a stuffed conspecific more strongly than they attacked a stuffed Common Cuckoo, strongly suggesting that this thrush has a major undetected parasitic habit. The phenomenon is, however, well documented for Eastern Bluebirds, and there is one recent record for



Less conspicuous than the parasitism of cuckoos is that of cowbirds. This photograph of a ***Wood Thrush*** *at its nest might appear to depict an ordinary domestic moment for this beautiful bird, until the taller stance, redder mouth and prematurely open eyes of one of its chicks is noticed. This little impostor is a Brown-headed Cowbird* (Molothrus ater), *a parasite that spares the brood but often reduces breeding success. Habitat fragmentation and pastoral farming in parts of North America have benefited cowbird populations, and in some cases the incidence of parasitism in nests of* Catharus *and* Hylocichla *thrushes is extraordinarily high.*

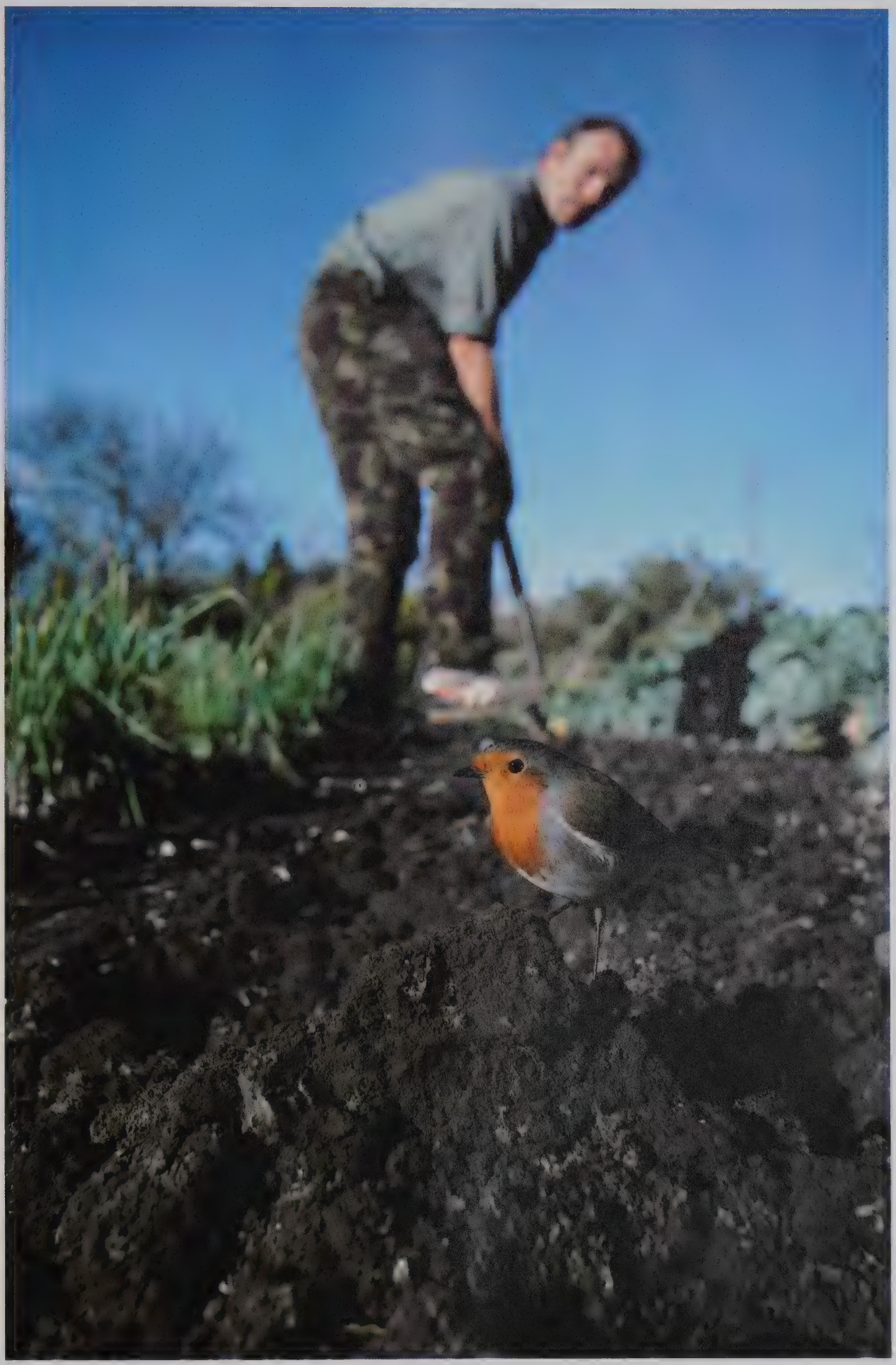
[*Hylocichla mustelina*, SW Ohio, USA. Photo: Dave Maslowski/ Maslowski Productions]

the Song Thrush. It may well be that this behaviour is much commoner than has been thought.

Co-operative breeding, in which nestlings are cared for by additional helpers at the nest, is relatively scarce among the Turdidae. It occurs regularly in 6% of the 194 thrush species for which the breeding system is reasonably well known, as against an 18·5% incidence among all biparental oscine passerines. Among the thrushes, this behaviour is found across the taxonomic spectrum, implying its repeated independent evolution in different lineages. One or two species in each of the genera *Sialia*, *Myadestes*, *Catharus*, *Copsychus*, *Saxicola*, *Oenanthe*, *Myrmecocichla* and *Erythropygia* are known to be regularly co-operative, as are those in the monotypic genera *Campicoloides* and *Psophocichla*. There are also occasional records of helping at the nest for species in the genera *Erithacus*, *Pentholaea*, *Sheppardia*, *Phoenicurus* and *Monticola*, as well as for additional species of *Saxicola*, *Oenanthe* and *Sialia*. For example, Black Redstarts exhibit co-operative breeding in Sweden, where the conditions of a strongly male-biased sex ratio and poor-quality habitats, with resident males offering few challenges to the helpers, are judged to be classic for this behaviour to arise. For most thrushes, especially tropical ones, however, the patterns of parental care are poorly known, and those species for which occasional co-operative breeding has been recorded have tended to be well-studied northern-temperate ones. Helping at the nest, therefore, probably occurs occasionally or even regularly among many more species, especially in the lesser-known tropics.

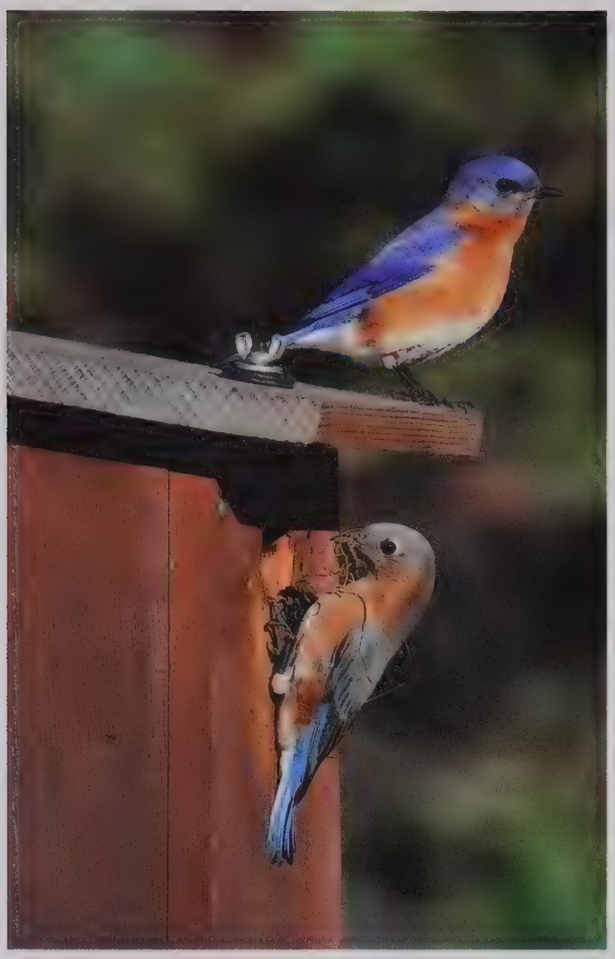
Helping, which in the Turdidae almost always involves only male individuals, is commonly explained through kin selection, whereby helpers are relatives of the breeding pair and therefore, if they are failed breeders, or are unable to breed owing to a shortage of suitable territories or mates, they gain indirect genetic benefits by helping to produce kin. Another benefit, however, especially in cases when helpers are non-relatives, may be potential paternity through sexual access to the breeding female. Only a small percentage of Western Bluebird nests have helpers, which are invariably male and which shoulder a varying proportion of the burden of raising the young. Kin selection predicts that helpers invest most effort in brood-feeding when assisting both of their parents, rather than one parent with a new mate, a "step-parent". J. Dickinson's long-term data from numerous Western Bluebird families demonstrate, however, that this is not the case: helpers feed young equally often, irrespective of the presence of a step-parent. Moreover, since the incidence of extra-pair paternity is about 20% in this species, a helper is more likely to be biologically related to the subsequent offspring of his mother and a stepfather than to those of his apparent father and a stepmother, and natural selection should hence favour helping in the feeding of maternal half-siblings more than in that of apparent paternal half-siblings. There is some indication, but as yet statistically inconclusive, that this is the case. A third prediction is that, in cases where the helper and the breeding female are unrelated, the helper should put most effort into raising a brood of young in which he might have a share of paternity, something which, owing to dominance, would be possible only when the breeding male is his brother, rather than his father. Sure enough, Western Bluebird helpers feed young more often when they have such a chance of siring nestlings, suggesting that helpers also use copulatory access in order to assess how much effort to invest in helping.

Fidelity to breeding site among adult turdids is often high, as already intimated with respect to older males reoccupying their previous year's territories (see also General Habits), which allows them to pair earlier and breed earlier, and hence to produce better-quality offspring. Varied Thrushes are so site-faithful that the nest of the current year is often surrounded by old nests and is sometimes simply placed on top of an old one, and so strong is the phenomenon in Wood Thrushes that their return rate allows a reasonable estimate of the species' annual survival. Fidelity to the natal site can also be high, although it is invariably more marked in male yearlings than in female yearlings. On the Hiddensee, in Germany, an interesting phenomenon has been noted in which, over several years, nesting Northern Wheatears moved closer and closer to their natal site. Thus, in one year 26 males settled within 1012 m of the natal site and 22 females within 628 m of it, and in the following year the distance from the natal site decreased by 41% in the case of eight males and by 22% in that of seven females. On the other hand, some species show little specific philopatry. In one study, only 14 of a total of 142 Veeries returned as breeders to the natal site, and, in another, only 2% of Townsend's Solitaires ringed in years 1–3 reappeared in the natal area in years 2–4. The definition of philopatry, how-



Left unmolested, thrushes have a propensity for extreme tameness. This trait is most noticeable in insular species which have evolved in the absence of predators, but it reappears wherever a benign public attitude to suburban wildlife prevails. One of the most famous example is the ***European Robin****, which in some regions has lost all fear of man. In Britain, it is exceedingly familiar and much loved (indeed, it is the national bird), in part because it is so tame. It can readily be trained to feed from the hand and it has a disarming habit of hunting invertebrates in freshly dug soil. In so doing, it perches on clods of earth, or on the handles of unattended spades, often little more than a metre from the human gardeners with whom it shares its territory. The robin's trusting nature, coupled with its beady-eyed look of cheeky intelligence, not to mention the bitter-sweet heart-rending melancholy of its winter song, endears it to people to such an extent that it has long been a cultural icon. It is wreathed in a history of folklore and superstition, which today is manifest most conspicuously in its close association with Christmas, and its appearance on seasonal greetings cards all over Europe. It seems useful to note that its tameness is not an intrinsic behavioural trait, but rather a response to the habits of man. Human behaviour is less benign a few hundred miles further south, where thrushes are still considered a delicacy and trapped for food in great numbers. Not surprisingly, robins and their relatives are shy and retiring birds in southern France, Italy, and throughout much of the Mediterranean basin.*

[*Erithacus rubecula melophilus*, Ringwood, Hampshire, England. Photo: Mike Read]



The much-publicized decline of America's cavity-nesting avifauna in the face of competition for nest-sites with House Sparrows (Passer domesticus) *and Common Starlings* (Sturnus vulgaris) *galvanized public opinion against those alien bullies, and in favour of direct action to save native species, especially the* ***Eastern Bluebird****. Local nestbox "trails" and programmes proliferated and proved immensely successful, not only in nurturing a resurgent bluebird population but in kindling a great deal of interest and pleasure in the general public.*

[*Sialia sialis sialis*, SW Ohio, USA. Photo: Dave Maslowski/ Maslowski Productions]

ever, depends on an agreed measure of distance. While adult American Robins tend to return to the same breeding sites, despite their winter nomadism, 70% of yearlings are estimated to breed within 40 km of their natal sites. Does this represent philopatry or dispersal?

Adult birds have higher breeding success than that of yearlings. This "age-related reproductive asymmetry" has been measured for several species. With Common Blackbirds, clutch-initiation date, breeding-season length and clutch size vary with age. First-year females start nesting on the latest dates, have the shortest breeding seasons, and lay the smallest clutches. Clutch-initiation dates are earliest at the age of 3·7 years and breeding-season length peaks at 3·6 years of age, but clutch size continues to increase gradually as the age of the individual progresses from one year to six years. Similarly, a recent study of Bluethroats found that young breeders were less likely to fledge young than were older ones, and the presence of a yearling in a pair strongly decreased the number of young produced per breeding season. With older males, higher success was related to the brood-provisioning rate during the first nestling period. For females, the laying date and the reproductive investment, in terms of clutch size, provisioning rate in the nestling period and brood condition, were the main determinants. Older Rufous Scrub-robins produce more and heavier fledglings than do yearlings, and adult Wood Thrushes, those past their first year, breed at higher rates than do yearling birds. All of these findings suggest that behavioural and physiological maturation is needed for young breeders to enhance their reproductive performance. They also provide a further reason why young females might seek older males to provide paternity for their offspring. Sexual maturity in thrushes is not certainly known to be reached before nine months, some northerly species hatching in August and breeding in May, but a Black-billed Thrush in Colombia, which had fully functional testes but a skull "more than half immature" in March, was probably less than nine months old and probably, therefore, some considerable period away from maturity.

Nest failure almost always results in a change of nest-site and fairly commonly in divorce. Just as the female bluebird is attracted to the nest-site, rather than to the site-holder, so the real divorce when nests fail is from the nest-site; sometimes the pair-members may stay together, so long as they both move away from the territory in which they failed. In years of frequent failure, notably when storms are responsible, a territory-holder has been observed to make as many as three nesting attempts with three different partners in the same season. In the case of Rufous Scrub-robins, divorce appears to be related to nest predation, which itself may reflect weak male contribution to nest defence. Among Common Blackbirds in Germany, the mean divorce rate, involving pair separation and the remating of at least one partner, was 19·3% between two breeding seasons and 5·1% within single seasons. The number of fledglings produced per season by partners which subsequently divorced was significantly lower than that of pair-members which stayed together. Females, but



The ***Red-throated Alethe*** *is a restricted-range species confined to the Albertine Rift Mountains Endemic Bird Area. Despite its limited extent of occurrence from Uganda to the Democratic Republic of Congo it is generally common in the undergrowth of montane forest and bamboo at high altitude, and therefore not thought to be in any danger of extinction. This is one of four species removed from* Alethe *because they were found to represent an entirely separate lineage. For the time being the English name "Alethe" is retained, but a more appropriate alternative may emerge.*

[*Pseudalethe poliophrys poliophrys*, Nyungwe Forest Reserve, Rwanda. Photo: Ariadne Van Zandbergen/FLPA]

not males, produced more fledglings in the season after divorce than they did with their former mates in the preceding year, and they successfully reared as many young as did females of the same age in stable pair-bonds. Divorce appears, therefore, to be female-driven. In England, divorce rates among Common Blackbirds were greatest in low-quality sites, and altogether involved 32% of 183 cases in which mates had survived from the previous year. After divorce, females tended to nest farther from their original site than did males, but, unlike the situation in Germany, breeding in a new site cost an average of one fledgling per year.

Breeding success is, of course, determined by important environmental variables beyond such factors as the quality of the territory or of the individual pair-members. For example, breeding success of the Common Blackbird corresponds well with the amount of rainfall in the period preceding egg-laying. Swainson's Thrush populations, at least those in America's West Coast riparian habitat, are strongly influenced by their own breeding productivity: there is a significant correlation between adult abundance in any given year and the number of young produced in the previous year, so that there may be density-dependent control of the overall population size. In Kenya, the presence of Fiscal Shrikes (*Lanius collaris*) in Common Stonechat territories appears to have a major depressive influence on the chats' breeding success, simply by stressing the adults through the threat of predation, not through active predation itself. Correlates of breeding performance can also be used. Thus, for Black Wheatears, the number of breeding attempts and the proportion of chicks resulting in fledged young, excluding broods that are preyed on, are the best predictors of seasonal reproductive success. Likewise, the number of young Wood Thrushes that hatch is the most important variable that positively influences the species' seasonal fledging success.

Juvenile Wood Thrushes move out of the natal area at 24–32 days of age. Juvenile dispersal from the territory may not, however, be driven entirely, or possibly even at all, by parental disownment. In one study, survival of juvenile Wood Thrushes was relatively high in the first two weeks after fledging and very high in weeks 4–8, but it was relatively low in the third week, which may well correspond with the first days of independence, when the youngsters probably linger in the interstices between territories before making a more decisive, longer-distance movement to better cover. In the case of Eastern Bluebirds, first-year birds suffer the highest mortality in October, probably because this is the month of dispersal, when they are first exposed to entirely new landscapes and contexts. The next highest mortality occurs in December, presumably as a result of severe weather, and the third highest is in March, just before breeding, perhaps as a result of the stressful events related to migration and to territory and mate acquisition.

Movements

In the Turdidae as currently constituted, full migratory behaviour is recorded for all or some populations of 73 species, or just 22% of all members of the family, while entirely sedentary behaviour is known for 134 species, or 40% of the family. This leaves 129 species, 38%, which make some sort of short-distance, usually elevational, movement in all or part of their ranges. It should be stressed that these calculations are made on often rather flimsy evidence or presumption, and discount cases in which movements have only been speculated, without good support; and that all of these figures may be subject to revision.

Thus, only one-fifth of thrush species are fully migratory, but three-fifths exhibit migratory behaviour of some sort, many of them doubtless being facultative, irruptive migrants in response to hard-weather conditions. It is perhaps reasonable to speculate that even the sedentary species, which are predictably mainly tropical in distribution, very probably for the most part undertake partial and/or very minor but as yet undetected movements in response to rains or drought or to local population build-ups. Indeed, their sedentariness is usually merely an assumption based on the absence of evidence of any movement. An intriguing instance of an apparently sedentary bird being suspected of having at least a semi-migratory habit, although this idea has not found universal favour, is presented by the record of a Blue-shouldered Robin-chat in Gabon imitating the song of a Common Nightingale, when the latter is unknown in the country.

The migration systems can be crudely grouped into eight as follows: Nearctic–Nearctic; Nearctic–Neotropical; Palearctic–Palearctic; Palearctic–Afrotropical; Palearctic–Oriental; and intratropical and/or vertical within each of the three tropical regions. Major migrations are undertaken by many of the most northerly Holarctic-breeding thrushes and chats, but there can be considerable variations within species, depending on latitude, severity of winter and other factors. Some movements involve simply a shift into the most southerly regions of the Holarctic, others take birds into the subtropical zone, and still others, but proportionately the fewest, result in occupation of the true tropics. In addition, of course, there are "leap-frog" movements, as demonstrated by the



The area of land in the Japanese Ryukyu archipelago inhabited by the ***Ryukyu Robin*** *is so small that it is classified as a restricted-range species. Fortunately, it is not thought to be threatened as its population is not only relatively large, at around 100,000 individuals, but also stable. In posture and pattern this beautiful bird recalls the European Robin* (Erithacus rubecula), *even as far as hopping about perkily and wing-flicking on roads at dawn. On biogeographical, behavioural and vocal grounds, however, it seems more likely to belong with the east Asian* Luscinia *radiation, into which it is here subsumed.*

[*Luscinia komadori namiyei*, Okinawa, Ryukyu Islands, Japan. Photo: Hirozo Maki]



*The **Chestnut-naped Forktail** occurs in the vicinity of small streams in humid lowland forests, from south Myanmar to Sumatra and Borneo, and thus its overall population must have declined substantially as a result of the catastrophic rates of forest loss in the Sundaic region. In many parts of its range it also occurs in the foothill zone, where habitat is slightly more secure, and for this reason it is treated as Near-threatened rather than threatened. It is one of the most forest-based of all forktails, and, like many of its relatives, rather shy, often revealing nothing more than a sharp distinctive call note and a streak of white flashing upstream through the gloomy understorey.*

[*Enicurus ruficapillus*, Hala Bala, Thailand. Photo: Morten Strange]

Song Thrush, in which northerly populations overfly and winter south of intermediate ones.

Owing almost certainly to their ability to exploit different types of food and their use of secondary, semi-open habitats, the great majority of migratory Old World thrushes and chats find their needs north of or in the northern subtropical regions stretching from West Africa eastwards, north and south of the Sahara, through East Africa, across the Indian Subcontinent and into Indochina and southern China. In the Americas, something of the same phenomenon applies, with species such as the bluebirds, Townsend's Solitaire, the Hermit Thrush, the Varied Thrush and the American Robin generally not shifting south into the tropical belt, and the majority of their wintering populations remaining within the USA.

Recent molecular studies, however, suggest that *Catharus* thrushes arose in the Neotropics (see Systematics), and that the colonization of North America has proceeded through seasonal emigration, with only the Hermit Thrush detaching itself, as it were, from its roots. Certainly, the Veery, the Grey-cheeked and Swainson's Thrushes, the Wood Thrush (albeit currently treated in *Hylocichla*) and, to a lesser extent, Bicknell's Thrush form the largest group of turdid species which migrate to the equatorial tropics, and this view of their origins strengthens the assessment that they are ecologically integral to the Neotropical Region, with particular, long-established niches. In the Old World, only the two nightingales in the genus *Luscinia* have vaguely equivalent status, and only one of them, the Thrush Nightingale, travels any real distance across the equator, reaching, in fact, as far south as northern South Africa. In the Far East, some of their congeners, namely the Siberian Blue Robin and, apparently, the Rufous-headed Robin, also journey far into the tropics. Just one Old World species, however, the Blue Rock-thrush, penetrates to the equatorial islands of the Indonesian archipelago, and it has even reached Australia, although, unlike the others, this is, in any case, a breeding species in the tropical Asian region.

Whether the farthest-penetrating representatives of these species are female or juvenile is not established, but an interesting phenomenon in turdid migration is the differential displacement of males, females and juveniles. This can be measured partly in the timing of the birds' departure from and, especially, arrival on the breeding grounds. Early arrival by males, termed "protandry", has been documented for the Eastern and Mountain Bluebirds, Townsend's Solitaire, Hermit Thrush, Veery, Swainson's and Wood Thrushes, Mistle and Song Thrushes, Grey-sided Thrush (*Turdus feae*), Ring Ouzel, Common Rock-thrush, European Robin, Thrush Nightingale, White-throated Robin, Whinchat, Common, Black, Daurian, Hodgson's (*Phoenicurus hodgsoni*) and Eversmann's Redstarts, and Northern, Black-eared, Cyprus and Finsch's Wheatears. For some species, the gap between male and female passages is so pronounced, ten days in the case of Ring Ouzels, 10–15 days for Black-eared Wheatears and up to 20 days for Hermit Thrushes, that two distinct waves have been reported. In Bahrain, for example, male Common Redstarts pass through in the first fortnight of April, while females turn up in the last ten days of the month and into early May. Reports from France of twin peaks in the spring migration of Song Thrushes, Redwings and Common Blackbirds probably derive from a similar pattern.

Studies of the Hermit Thrush have shown that females actually travel farther south than do males by a mean of 1·2° of latitude. Three possible explanations for this are that males dominate females and force them to move farther, that larger body size enables males to overwinter in colder areas, and that males, for reasons discussed earlier (see Breeding), seek to stay closer to the breeding grounds. Evidence of male dominance could not be found, nor could it be shown that males have greater cold endurance, although the fact that the males are larger would allow both of these explanations to stand; it appears however, that the advantage of arriving back early on the breeding grounds balances any cost of wintering or migrating under conditions more demanding than those experienced by the females. Even so, the explanations are not mutually exclusive, and the effects of aggression and/or size need, at least, to be borne in mind when considering the fact that the females of certain other species also move farther than do their males. For example, recoveries of Common Redstarts ringed in Britain have a median distance of 735 km for males and of 1117 km for females, and recent evidence suggests that the majority of European Robins immigrating into Spain in winter are female. In south-west Germany, there is a tendency, as they increase in age, for female Common Blackbirds to migrate and for males to remain, the latter being rewarded by greater breeding success compared with migratory



The genus Zoothera *has diversified in the Indonesian archipelago, producing some stunningly beautiful island forms. One such is the* ***Chestnut-backed Thrush****, a bird of lowland and mid-altitude forests in the Lesser Sundas. It occurs from Lombok to Timor and Wetar, but its populations have all but disappeared from certain islands, as a result of deforestation and trapping. Unfortunately, the cage-bird trade is rampant in Indonesia, and this thrush is heavily targeted due to its striking pattern and beautiful song. The resultant declines in its populations have led to its classification as Near-threatened.*

[*Zoothera dohertyi*. Photo: Konstantin Mikhailov]

males. During the April–August winter period on the Nyika Plateau, in Malawi, it is the female White-starred Robins that leave and the males that remain in place. Similarly, in the Himalayas, females of the White-throated (*Phoenicurus schisticeps*) and Güldenstädt's Redstarts make vertical movements in winter, whereas males move to local valleys. As a further example, most of the Indian Blue Robins spending the non-breeding season in Sri Lanka are females.

The phenomenon extends to juveniles. In Sri Lanka, most of the wintering Indian Blue Robins are *juvenile* females. Farther east, in Hong Kong, the "vast majority" of Orange-flanked Bush-robins are either first-winters or females, adult males turning up in volume only during unusually cold weather; the same is true of Plumbeous Water-redstarts. Likewise, first-winter Song Thrushes travel farther than do older cohorts. In studies of Black Redstarts in Spain, young birds are found decreasingly from November onwards, while adults are roughly constant in numbers through the winter, suggesting that young individuals continue southwards into north-western Africa, where most recoveries have been recorded, in December. Similarly, Common Redstart adults are proportionately more abundant in Spain in winter than are first-winter birds, and the proportion of juvenile European Robins in Spain falls over the course of the winter, suggesting that they move on. An interesting study of Common Stonechats in Israel examined the relationship between the numbers present at a wintering site and local rainfall, air temperature and arthropod abundance. In some years the stonechat population remained constant, but in others it declined to about a third of its original size, and in the latter cases it was young, unpaired individuals that disappeared. The declines correlated with the timing and quantity of rainfall, and with arthropod density. Clearly, the adults were capable of exploiting what food was available in straitened circumstances, but did the young birds leave simply because they were not so capable, or were they pushed out? And to what extent may this be true also of females which move farther than males? These questions have already been touched on (see Habitat).

Juvenile Bluethroats, and doubtless juveniles of all migratory species, are, wholly unsurprisingly, less efficient than adults in terms of foraging and migratory competence, and, at least initially, they move away from the breeding quarters much more slowly than do the adults. Juveniles cover only 11–21 km, and then 30–65 km, per day, as against the adults' 100–110 km per day, although their speed picks up as the autumn progresses. Older juveniles leave the natal areas earlier, and probably undertake short-distance movements to more favourable sites in which to fatten for the longer journey to the non-breeding quarters. Often, they leave their natal areas while still in active post-juvenile moult, or before commencing it, and do not put on any significant fat, probably because of generally poor foraging conditions; once the moult is finished, they usually acquire fat rapidly. Juvenile females, being smaller than males, arrive on their wintering grounds on average three days before juvenile males, and this has been speculated as possibly a means of avoiding competition with the latter. The migration period of adults is more concentrated. They carry more fat and make shorter stopovers than do juveniles, in addition to which they orient with greater precision, possibly because of experience, and possibly because imprecise orientation is selected out in year one. It is difficult to believe that these finer-tuned, highly efficient adults, especially males, would not exert a considerable influence over the behaviour of juveniles, and females, through their physical dominance in the areas which they choose to occupy.

Although some migration may occur by day, particularly in the case of more sociable species, which often extend their nocturnal movements, most thrushes and chats, if not all of them, undertake their major migratory flights at night. For European Robins, key variables in decisions over whether to migrate on a given night are the presence and amount of rainfall and the speeds of wind at an altitude of about 300 m, although how the robins assess wind speed at this altitude is not understood. The probability of migration is highest during nights with little or no wind at 300 m, and no rain; it is intermediate on nights (a) with no rain but with medium wind speeds, and (b) with rain and weak wind; and the probability is almost zero on nights with both rain and strong winds at 300 m. There is a common and entirely reasonable assumption that birds prefer light tailwinds, and some evidence from Germany that Song Thrushes use them when they can. Clear skies caused by high pressure are, however, probably more important, and are commonly favoured by most species, at least in the autumn, when celestial navigation is unimpeded. Under heavy cloud cover, on the other hand, some, if not all, bird spe-

cies, Northern Wheatears and Common Redstarts being examples, can also use magnetic cues for orientation. In fact, there is evidence that species descending from the far north compile information from a variety of available sources in order to navigate with maximum accuracy. Scandinavian research has even suggested that, over water and under cloud, day-moving thrushes use wind-induced wave direction as a means of maintaining the bearings on which they began their journeys.

Other major cues are food supply and body condition. Fieldfares move when rowanberry (*Sorbus aucuparia*) stocks in their nesting areas fall below a depletion threshold. In America, a study of migratory *Catharus* and *Hylocichla* thrushes showed that lean birds display less activity at night but more activity by day than do individuals with undepleted fat reserves, but that their nocturnal restlessness, a measure of readiness to migrate, increases with fat replenishment. Most interestingly, when caged Swainson's Thrushes in variously fat and lean conditions were tested for early-morning orientation, it was found that the fat birds chose directions across the Gulf of Mexico, while lean ones selected directions away from the coast, presumably in search of further refuelling habitats. Recent work with Thrush Nightingales indicates that not only fat, but also protein, is deposited before and during migration, in respective percentages of 82% and 18%, possibly in part to supply the muscular strength required to carry the newly much heavier bird. This species, and doubtless also all others, lays down fat faster at colder temperatures, although not as a consequence of feeding any more rapidly. Physiological constraints such as the building of gut tissues and enzyme systems are evidently in play. Experiments with a Thrush Nightingale in a wind-tunnel, where it flew for a total of 176 hours, equivalent to a distance as great as 6300 km, revealed that the bird was far more capable of fat deposition on day two than on day one of its "journey", indicating a build-up of the capacity of the digestive tract during the first day of fuelling.

Northern Wheatears stopping over on Heligoland, off the north-west German coast, during spring and autumn migration also suffer from metabolic limitations. They spend 51–67% of the daylight period in foraging, and use the remaining time largely for resting or vigilance, irrespective of body condition. On the beach, which offers the most favourable feeding conditions and allows high rates of body-mass gain, the total time which they devote to foraging is independent of day length, and when additional food in the form of mealworms was experimentally offered in bowls it was completely ignored. Those wheatears heading eastwards to Scandinavia, and therefore facing only a short sea crossing of 50–500 km, mostly move on within a day of arrival, irrespective of weather conditions. In contrast, those moving northwards to Iceland and Greenland, and therefore facing a sea crossing of anything from 1000 km to a hair-raising 2500 km, the longest transoceanic migration regularly undertaken by any passerine (and all the more impressive for being preceded or followed by a crossing of the western Sahara), typically stop over for at least one night, often establishing a feeding territory and gaining 1·7 g in weight per day, and wait until weather conditions favour their onward journey. Weight loss and gain for such migrants can be remarkable. Northern Wheatears travelling down from Greenland to Fair Isle might depart with a weight of 40 g and arrive weighing 20–25 g. A telling example involved a vagrant female Common Redstart trapped on Cousin Island, in the Seychelles, on 22nd October 1981, when it weighed 12·2 g; when retrapped on 9th November, it had fat visible on the breast and weighed 21 g, an increment of 72% in 18 days, and auguring well for the bird's successful relocation to Africa.

Typically, a nocturnal migrant thrush commences its flight about half-an-hour after sunset in clear conditions, and somewhat later, sometimes not until well after midnight, if the sky is overcast. If land is available, it terminates its flight about half-an-hour before sunrise. Studies of Swainson's Thrush and the Veery have established that, as with aircraft, there are distinct ascent and cruising phases. The former lasts for about 15 minutes as the bird reaches its cruising altitude, at which point the wingbeat frequency declines by 4 Hz to reach 9–11 Hz, and wingbeats are then continuous, with no evidence of a flap-and-glide strategy. A Thrush Nightingale trained to fly in a wind-tunnel, a different individual from the one mentioned earlier, also used continuous flapping flight even when undertaking a 16-hour stint. Radio-tagged Hermit Thrushes reached a cruising air speed of 36 km/h, and adjusted both heading and altitude to negotiate prevailing winds, even landing in order to avoid thunderstorms, while Swainson's Thrushes exhibited ground speeds varying from 15 km/h to 96 km/h and maintained a constant heading and air speed, irrespective of wind conditions, cloud cover or landmarks.



*The **Tristan Thrush** is endemic to Tristan de Cunha, and associated islands in the South Atlantic. Once thought to number about 1000 birds, this estimate has been revised upwards to 6000. Despite these relatively low figures, it appears hardly threatened by habitat alteration. Given the possibility of mammalian introductions, however, it is maintained in the Near-threatened category on a semi-permanent basis. Outwardly, it seems to be a neotenous representative of* Turdus, *but it is retained in its own genus on account of a modified tongue, an adaptation for sucking the contents of seabird eggs.*

[*Nesocichla eremita procax*, Nightingale Island, Tristan da Cunha. Photo: R. & C. LeDuc/ VIREO]



Another Near-threatened insular form is the ***Fuerteventura Stonechat****, endemic to the Canary Island of that name. Recent estimates conclude that over 1000 pairs survive, but these are threatened by habitat loss and desertification due to overgrazing and tourist development. It thrives in stony fields, on shrubby slopes, and along tamarisk-lined watercourses, habitats which require protection to ensure its long-term survival. It is notably divergent from adjacent North African forms of the Common Stonechat* (Saxicola torquatus)*, but its status as a species nonetheless requires clarification.*

[*Saxicola dacotiae*, Triquivijate, Fuerteventura, Canary Islands. Photo: José Juan Hernández Martínez]

Migration altitudes vary with conditions. Hermit Thrushes kept mainly to between 900 m and 1500 m, and Veeries to 200–1000 m, although one Veery was tracked at over 2000 m, and Swainson's Thrushes to 65–2000 m, the lowest heights being used in fog or rain. Over the North Sea, Scandinavian migrant thrushes have been observed on radar to drop to near the surface of the water during the course of the night, but to gain altitude again at dawn or even, later in the autumn, 1·5 hours before dawn; this latter phenomenon may have to do with the seeking of visual cues for a landfall, or the avoidance of predation by seabirds.

In the spring, Swainson's Thrush has been timed as it crossed North America from Veracruz, in Mexico, where the median passage date is 12th May, to Maine, in the north-east USA, where the median passage date is 18th May. It was found to cover a distance of 520 km per day, whereas the average rate of autumn migration, travelling from the breeding grounds south to the Alabama coast, is a mere 119 km per day for adults and 108 km per day for juveniles. Telemetry data disclose flight distances of 105–375 km per night and flight durations of 333–503 minutes. Remarkably, while individuals lose a substantial amount of body mass during long southward flights of up to 1000 km across the Gulf of Mexico, the birds tend to put on, rather than lose, weight on the return migration, despite the rapid speed of this northward movement. Thrushes arriving in the north-east USA are some 3·5–5 g heavier than they were when they left Louisiana, probably as a result of using a "feed-by-day, fly-by-night" strategy, rather than the "pile-it-on, burn-it-off" one used perforce by over-water migrants and involving several days of feeding-up followed by several days and nights of almost continuous travel. During their daytime spring stopovers, *Catharus* thrushes fix on tiny areas, sometimes as little as 400 m², in which to refuel.

Migrants sometimes return to the same stopover sites in successive years, and it is clear that thrushes and chats share with many other passerines a striking level of precision in their navigation and itineraries. Displacement experiments with telemetry showed that Wood Thrushes can quickly navigate back to their territories if moved 6·5–15 km away. Allied to this is the very exact programming which leads two groups of European Robins passing through geographically close migration points in southern Sweden to adopt very different fat-deposition strategies. Thus, robins at Falsterbo are heavier and carry less fat by comparison with those at Ottenby, and they are presumed to be short-stage migrants travelling over land and needing only small fat reserves, whereas Ottenby robins are long-stage migrants needing relatively large fat reserves to get them across the Baltic Sea. The supposed genetic basis for migration has been elegantly supported by experimentally hybridizing Common and Black Redstarts, the offspring of which were intermediate between the two parents not only in the duration of migratory activity in captivity, but also in the timing of its onset. This does not necessarily mean, however, that all birds from the same lineage always share the same programming, as evidenced by the notable, if rather anomalous, record of two Redwings ringed as brood siblings in Finland which were recovered in the same month, February, of the following year, one in Wales and one in south-east France.

It may be that the Redwing, along with several other highly sociable northern Eurasian species, including in particular the Fieldfare, are among the few turdids in which, owing to their strong dependence on unpredictable supplies of berries, philopatry has been virtually programmed out of the genetic behavioural code. The Fieldfare is strongly nomadic and fluid in its use of areas. So, too, is the American Robin, at least in the non-breeding season, ringing records showing that individuals wintering in a particular place are from widely scattered areas. There is no evidence that individuals return to the same winter territories. In this species, as with the Fieldfare, migration is facultatively driven by resource availability. From the existence of simultaneous peaks in migratory numbers of American Robins in both Maryland and Arkansas, in middle to late October, it appears that entire populations shift south, replacing each other, rather than exhibiting the "leap-frog" pattern shown by some northerly populations of certain other species, such as the Song Thrush. Nomadism appears to occur, in limited form, even in the Island Thrush on Taiwan and Borneo, with populations suddenly appearing in areas where the species had for long been absent, presumably in response to fruit availability.

Migrations and, indeed, elevational displacements are undertaken as a means of exploiting temporarily available resources in two different areas of the world, and the ability to switch between geographically separate homes obviously bestows huge benefits without which the species, or large populations of the species, could not survive. Nevertheless, migration is itself a pre-

carious venture. The greatest risk comes from unexpected bad weather, which can push migrants far off course and leave them far from land, or can result in death simply through hypothermia; when storms break over water, the birds have nowhere to land and are driven into the sea. There is the particular risk of death at lighthouses and other disorienting illuminated structures in cloudy weather (see Status and Conservation). As exhausted over-sea migrants approach the coast at dawn, flitting above the waves, they can be picked off by gulls. Even the process of fattening-up for the flight presents a risk. This was demonstrated by first-year European Robins exposed to experimental attack from model Merlins: the robins took off at lower angles the heavier they were, and they were unable to adjust to different angles of simulated attack, indicating a lower fitness to escape.

Relationship with Man

The lives of men and women have been greatly enriched by the lives of thrushes and chats, always allowing that, as with many birds, there are occasional complaints about the depredations of fruit crops by such species as the American Robin, the Fieldfare and, of all things, the Pied Thrush in Sri Lanka. The reverse cannot so easily be said, however, for thrushes and chats have in the past suffered and, in some parts of the world, still suffer egregiously from ruthless human exploitation. All the same, it is the case, as already discussed (see Habitat), that members of the Turdidae have increased their ranges and numbers through the anthropogenic creation of semi-open habitats, and some of our best-loved species are those which today live in closest association with us.

Thrushes and chats are of interest to humans in two basic ways: as food and for their songs. Centuries ago, winter in Europe was always a time of scarcity, so that the flocks of Fieldfares and Redwings pressing in from the north and east must have been like manna. There is a seventeenth-century record of 600,000 Fieldfares being taken in east Prussia during a single winter. The Romans, predictably, made the most of these birds, keeping them by the thousand in darkened cages, to be fattened up on a paste of flour and figs, and then sold for three *denarii* each. Fieldfares, Redwings and Song Thrushes are still today hunted for food in parts of southern Europe and north Africa, as evidenced by the small body of scientific studies conducted in Spain over the levels of radioactivity in, and the safety to human consumers of, Song Thrushes killed in the country but originating from around the Ukrainian city of Chernobyl, site of the appalling nuclear-reactor disaster in 1986. Indeed, so ingrained is such hunting in Mediterranean man's life that the practice went with him to places such as Brazil, where Sick, singling out the "descendants of Italians", inveighed against it as a scandal, but even in North America, from colonial times well into the nineteenth century, American Robins were widely trapped and shot for food. Until relatively recently, there was a familiar industry in France involving the conversion of many Song Thrushes, Redwings and Fieldfares into a delicacy known as *pâté de grives*. Indeed, where in England the acceptance of straitened circumstance was signalled by the phrase "beggars can't be choosers", the Gallic equivalent was once the rather more bullish *faute de grives on mange des merles*, meaning "if no thrushes, we shall eat blackbirds", which reveals an interesting point of discrimination over the taste of the latter—is the black of the Common Blackbird proaposematic?

Not if the English nursery rhyme is to be believed. This tells of "four-and-twenty blackbirds baked in a pie", although, in this instance, the birds survived the experience to sing when the crust was broken, thereby also proving that they were not in fact crows. In truth, the English were no different from the peoples to their south in these matters but just, as usual, a lot less stylish: while the French were making their tender, berry-eating thrushes into paste, the English chose to eat their way through the hordes of Northern Wheatears passing through the country. Thousands of these birds were caught on migration in nooses deployed on drystone walls across southern England, and many of the victims were sent to the cities for consumption there as a delicacy. Of course, the early persecution of thrushes and chats could not have been carried out with guns as it is today, but would have involved lime and nooses. The scientific name of the Fieldfare, *pilaris*, is of uncertain origin, but it may derive from the Latin *pilus*, a hair, and thus refer to the old method of catching the species in hair traps. In parts of Egypt and Greece, the use of lime to trap many passerine species, including European Robins, Northern Wheatears and Common and Thrush Nightingales, has been replaced by the more efficient mist-net.

Elsewhere in the world, thrushes and chats were caught apparently more for the satisfaction of the sounds that they make than for the sustenance that they offer. Several hundred years ago, nightingales were immensely popular in Europe, and in 1751 the definitive guide to the keeping and management of these in captivity was produced in France— A. de Nobleville's *Aedologie,*



Stoliczka's Bushchat *is an enigmatic bird of barren xerophytic plains in northwest India. Its population appears to be small, and its occurrence sporadic, an impression exaggerated by minor but poorly understood migrations. The key issue for this species is habitat loss, as a result of both irrigation schemes and overgrazing of sparsely vegetated habitats. These threats have caused a spectacular contraction in range, such that it has virtually disappeared from Pakistan and the northern Thar desert. It is therefore listed as Vulnerable. Habitat protection is needed in remote deserts of western Rajasthan, where it remains locally or seasonally common.*

[*Saxicola macrorhynchus*, Little Rann of Kachchh, Gujarat, India. Photo: Otto Pfister]



Until recently the Western Ghats of southern India were thought to host an endemic shortwing in the genus Brachypteryx, *but this has been reclassified in* Myiomela *and split into two species, one of which is now known as the* ***Nilgiri Blue Robin****. Even when both forms were lumped their overall range was small, as was their predicted population size, and thus they qualified as Vulnerable. As currently viewed, this species is virtually endemic to the Nilgiri hills, but it is not thought to be severely threatened as it remains fairly common in several patches of well-protected forest.*

[*Myiomela major*, India. Photo: Tim Loseby]

ou traité du rossignol franc, ou chanteur; he recommended heart and ants' eggs as food for these birds. Nineteenth-century bird-catchers were so adept at attracting nightingales up to their traps in April by whistling that a man could catch one in five minutes, and up to 30 in a day. Rather more recently, the Oriental Magpie-robin was reported to be a popular cagebird around Hong Kong in 1967, and it presumably still is, the birds' owners holding singing contests at which they gather together at a place, uncover and suspend their cages in a tree, and let the birds sing full-pelt at each other. The extent to which this was done competitively or simply for aesthetic effect is not always clear, but in India the same species is reported to have been used by the rich for "cock-fighting" in the nineteenth century. Song contests there involved, when possible, the magpie-robin's close relative, the White-rumped Shama. The distinguished naturalist E. Blyth recounted that "Many thousands of these elegant birds are kept in Calcutta. It is a practice of the rich natives to employ servants to carry about their Shamas and other birds; and the number which are thus borne about the streets of Calcutta is astonishing; the poor birds are shut out from all light and air… but they nevertheless sing forth most lustily and melodiously." The Japanese are reported to have supplied the substantial demand for Ryukyu Robins by means of "fly-fishing"; no further details are given, but one must assume that horrific damage was done to the mouths of the birds. The Indonesian love of cagebirds and songsters has in recent years produced an unsustainable pressure on the small *Zoothera* thrushes of the country.

Speckle-breasted thrushes on both sides of the Atlantic Ocean may be difficult to keep in cages, or they may fail to sing in captivity. At any rate, they seem to have suffered little persecution for the trade. On the other hand, White-throated Thrushes are commonly kept as cagebirds in Colombia and Venezuela, and the thrushes of Middle America have been heavily exploited for their singing capabilities. In Costa Rica and Panama, the Clay-coloured Thrush is extensively trapped for its voice, a practice which one observer berated as entirely unnecessary since wild individuals have penetrated every city and, in season, sing all day long for the pleasure of anyone who has ears. A population of this species around Oaxaca City, in Mexico, probably derives from escapees. In the same country, two recently established populations of Rufous-backed Thrushes, one in Distrito Federal, where it lives at elevations far greater than do those encountered elsewhere, and the other in Oaxaca City, are assumed also to stem from escaped cagebirds. On the other hand, populations of the Slate-coloured Solitaire (*Myadestes unicolor*) in eastern Mexico have been reduced and possibly extirpated by the trade. Other species of solitaire, which are prized as among the best songsters of any avian family, are kept in many parts of Middle America and the Caribbean. The voice of the Black-faced Solitaire, the *jilguero*, although exquisitely beautiful in the wild, is said to sound harsh and jarring in urban surroundings, although perhaps most of all to the ears of those who wish them free.

Poets have not needed captive birds for their inspiration. Indeed, the notion of captivity was anathema for the visionary artist and poet William Blake, who famously declared in *Auguries of Innocence*:

> "A Robin Red breast in a Cage
> Puts all Heaven in a Rage."

Several English poets, including Alfred Lord Tennyson, Thomas Hardy, Siegfried Sassoon and Ted Hughes (see also Food and Feeding), wrote noteworthy poems in which they took as their point of reference thrushes, or more specifically, as an ornithologist can tell from context, the Song Thrush. In *The Throstle*, Tennyson, the celebrated Victorian poet laureate, transliterated the repeated phrases of the Song Thrush and indulgently humoured them in the knowledge that spring had scarcely arrived:

> "'Summer is coming, summer is coming,
> I know it, I know it, I know it.
> Light again, leaf again, life again, love again!'
> Yes, my wild little Poet."

The affection is carried beautifully, however slight the sentiment. Hardy, more familiar as a novelist of some distinction, is as grimly funereal as ever about the condition of mankind in his poem *The Darkling Thrush*, written on 31st December 1900 and hence not only in the dead of winter, but also on what he deemed to be the last day, the dying day, of the nineteenth century; but he, as Tennyson, drew inspiration of sorts from a thrush that chose this of all moments to "fling his soul Upon the growing gloom" and



The differences between ***Bicknell's Thrush*** *and its closest relative, the Grey-cheeked Thrush* (Catharus minimus), *are so subtle that its status as a species was only publicized in the 1990s, and remains contentious. If maintained as such, it is estimated that 21,000–53,000 mature individuals survive, mostly in the USA, and only marginally in Canada. The entire population migrates to the Caribbean in winter, particularly Hispaniola, Jamaica, Cuba and Puerto Rico. It appears to be in steep decline because of habitat loss and deterioration in its breeding and non-breeding ranges, as a result of which it is classified as Vulnerable.*

[*Catharus bicknelli*, Stratton Mountain, Vermont, USA. Photo: Sarah Frey]

offer the listener a token of hope and renewal where none otherwise seemed to exist. Sassoon, a distinguished poet of the First World War, simply felt the dislocation of nature and man, and in *Thrushes* he juxtaposed, with clear but understated bitterness, the bright, coherent, self-contained life of the birds "whose voices make the emptiness of light A windy palace" with the "haunted… baffled" life of man "Who hears the cry of God in everything And storms the gate of nothingness for proof."

Although not good as cagebirds, the North American thrushes have done well in the continent's poetry. A thrush, called a "hermit" and indeed presumably of this species, sings through the extraordinary lament that Walt Whitman wrote for Abraham Lincoln, *When Lilacs Last in the Dooryard Bloom'd*. The sense of mourning and loss in this poem, which extends to all who died in the Civil War, is enfolded by the song of the thrush, the "gray-brown bird", in a "carol of death" that becomes a celebration of death and, finally, an admission of life. The immediate subject of what is possibly Emily Dickinson's most famous poem, *A Bird Came down the Walk*, must surely have been a thrush, although the poem is not really about the bird at all: it dismembers a worm, and has a worried demeanour with eyes "like frightened Beads", which brings to mind Hilty's description of Swainson's Thrush (see General Habits). What is certainly one of Robert Frost's most delightful short pieces, *Come In*, hinges on the conceit, dismissed in the last line with a wry smile, of a thrush singing him an invitation into a dark place of lamenting, when it is, after all, just a thrush, singing from the darkness of a twilight wood. Frost captures the bird, the moment and the mood in seemingly the simplest of styles.

Then there is T. S. Eliot. He no more wrote a poem "about" a thrush than did his foregoing countrymen, but the birds make momentary, haunting appearances in his verse. There is the

> "sound of water over a rock
> Where the hermit-thrush sings in the pine trees
> Drip drop drip drop drop drop drop
> But there is no water"

in *The Waste Land*, in which Eliot includes a deliberately irrelevant footnote to the effect that "This is *Turdus aonalaschkae pallasii*, the hermit-thrush which I have heard in Quebec Province… Its 'water-dripping song' is justly celebrated". There is, in *Marina*, the "scent of pine and the woodthrush singing through the fog". Both references have a peculiar evocative power created largely by their very spareness, like a Chinese painting on silk, something which the repeated reference to pines reinforces. The same is true of the moment at the start of *Burnt Norton*, the first of his *Four Quartets*, when—and this is now England rather than New England—we read:

> "Other echoes
> Inhabit the garden. Shall we follow?
> Quick, said the bird, find them, find them,
> Round the corner. Through the first gate,
> Into our first world, shall we follow
> The deception of the thrush?"

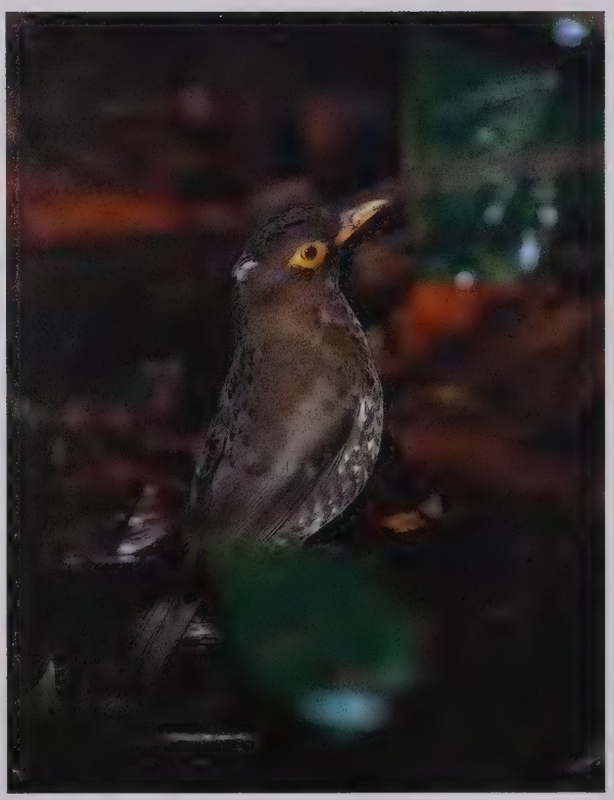
That repeated "find them, find them" and those alliterative repetitions of "follow" and "first" remind us of Tennyson's transliterations: if this thrush is a thrush at all, it is a Song Thrush.

Eliot also made several hard-boiled references to nightingales, but in the English language, at least, the greatest piece of writing to which the Common Nightingale is central is by John Keats. His *Ode to a Nightingale* is one of the greatest triumphs of romantic poetry, a richly textured, profoundly felt meditation on everyday human suffering and mortality as set in relief by the experience, unequivocally something that Keats personally had, of hearing the species in full song at dusk. The beauty that he perceives is so overwhelming that it actually hurts:

> "'Tis not through envy of thy happy lot,
> But being too happy in thine happiness—
> That thou, light-wingéd Dryad of the trees,
> In some melodious plot
> Of beechen green, and shadows numberless,
> Singest of summer in full-throated ease."

These lines, with that brilliantly invented adjective "beechen", evoke with genius the feel of the experience, as anyone will testify who has been privileged to stand in the still spring air of late twilight near a singing nightingale, of whichever species, whether with beech trees or not. But Keats takes it much further, revelling in the richness of the moment to the point where

> "Now more than ever seems it rich to die,
> To cease upon the midnight with no pain,
> While thou art pouring forth thy soul abroad
> In such an ecstasy!"



The ***Forest Thrush*** *occurs on the Caribbean islands of Montserrat, Guadaloupe, Dominica and St Lucia. Of these four populations, the only one thriving was that of Montserrat, but this suffered a dramatic decline in the wake of a series of volcanic eruptions in the 1990s. Numbers have apparently recovered, but it remains threatened on all islands by habitat loss and fragmentation, predation by introduced mongooses* (Herpestes), *brood-parasitism by cowbirds* (Molothrus), *and human exploitation for food. Strict protection of forest reserves is needed, along with hunting bans where necessary.*

[*Cichlherminia lherminieri dominicensis*, Morne Trois Pitons National Park, Dominica. Photo: Roland Seitre]



The total range size of the ***Izu Thrush*** *is tiny, owing to the fact that it only occurs on scattered islets off Japan, mostly in the Izu archipelago south of Tokyo. There is some indication that populations are falling in response to heavy predation by introduced rats* (Rattus), *Siberian weasels* (Mustela sibirica), *Large-billed Crows* (Corvus macrorhynchos) *and domestic cats. Given a likely population under 10,000 birds, and an apparent decline, this thrush qualifies for treatment as Vulnerable. On several islands, however, it remains an abundant bird of gardens and roadsides, and it seems unlikely to disappear in the immediate future.*

[*Turdus celaenops*, Japan. Photo: Hirozo Maki]

Then, while the poet contemplates how this same song was heard in Roman and in biblical times, the singer shifts his ground and loses his listener, leaving him questioning his senses. Poor Keats, who was tubercular, was taken soon enough by "easeful Death", but there is perhaps no greater instance of the inspiration that a singing bird can be to the human heart or mind than that which one Common Nightingale gave him on that night in May 1819.

Composers of music, too, have drawn inspiration from thrushes and chats, but the associations are for the most part loose and transitory. For example, Ravel, in his piano piece "Oiseau Triste", from *Miroirs*, elaborates the idea of a Common Blackbird lost in a hot summer forest; it is lovely music, but one should not look for evidence of *Turdus merula* in it. On the other hand, at least two composers have deliberately gone closer to the original. Messiaen's obsession with birdsong, as the voice of God in nature, led him to compose his monumental piano work *Catalogue d'Oiseaux* and his much shorter *Petites Esquisses d'Oiseaux*, the former with several species of chat, the Common and Blue Rock-thrushes and the Black and Black-eared Wheatears, and the latter with the more expected subjects of the Common Blackbird, the Song Thrush and the European Robin, all represented in his unique style which, nonetheless, brings a strange flavour of veracity to each species. Respighi, in his orchestral *Pines of Rome*, went still further by introducing a tape recording of a Common Nightingale, lasting about 50 seconds, towards the end of the piece, in one of the earliest examples of the use of electronics in music.

Nightingales feature prominently in European and western Asian poetry, folklore and stories. In Greek fable, Tereus, King of Thrace, violated his wife Procne's sister, Philomela, and then cut out Procne's tongue for fear that she would report the crime. As the revenge of the sisters reaches its climax, he is changed into a hoopoe (*Upupa*), Procne into a swallow and Philomela into a nightingale. Later versions have Philomela losing her tongue, which makes more sense as a criminal's strategy but less sense in terms of the transformation, following which Philomela sings her heart out in lament while Procne can only twitter. So pervasive was the influence of this story that most European poets and writers portrayed the singing nightingale as (a) female and (b) grief-stricken. At some point, too, the pain of grief gave rise to the conceit that the nightingale sang with its breast against a thorn, so as to stay awake through physical pain in order to give voice to the emotional one. This may have come into western literature from stories originating in Persia perhaps with the fourteenth-century poet Hafiz, who wrote about the nightingale as nourishing the rose with drops of his blood. And at some stage Oscar Wilde caught this idea and turned it into the most exquisitely poignant of his children's stories, *The Nightingale and the Rose*. A hundred years later, R. Mabey pulled together many of the stories and many other engaging references relating to the species in his delightful *Whistling in the Dark*.

The only other turdid species that figures deeply in European writings and folklore is the European Robin. Many obscure but notable passages of old poetry and prose relating to the species were traced and used by Lack in his ground-breaking book *The Life of the Robin*, but the folklore attaching to it is extensive. A disarming number of superstitions existed telling that the harm of a robin resulted in harm to the perpetrator, who would suffer such things as palsy, epilepsy, swellings, broken limbs, smashed

Like its congeners, the ***Javan Cochoa*** *is a beautiful but inconspicuous bird of humid forest canopies in the montane zone. It is restricted to the highlands of western Java, where constant erosion of habitat due to agricultural expansion ensures that its small population is steadily declining. It is therefore treated as Vulnerable, although much of its range lies above the agricultural zone or within protected areas. The most important of these, Gunung Gede-Pangrango and Gunung Halimun National Parks, deserve strict protection and effective management.*

[*Cochoa azurea*. Photo: Stan Osolinski/ Oxford Scientific Films]



crockery, burnt-down homes, and even bloody milk from his cows. Robins were believed to care for the dead by covering the eyes or face of the departed with moss, and to sing sorrowfully by the body until it is buried. Robins singing from high perches presaged fine weather, while robins around or, worse, entering the house in autumn foretold hard weather. Robins brought fire from heaven, and quenched the fire of hell; and in due course they became closely associated with the religious festival of Christmas, being portrayed on the majority of seasonal greetings cards produced in Europe. The species was and still is, particularly in Britain and northern France, a cultural icon.

In fact, the European Robin is the "national bird" of the United Kingdom. Sweden has the Common Blackbird and Malta the Blue Rock-thrush, while Turkey has, for some reason, the Redwing. The national bird of Bangladesh is the Oriental Magpie-robin. In Costa Rica, this title is held by the Clay-coloured Thrush, something of which some of the country's more permissive inhabitants may be extravagantly proud if ever they learn about the private life of this species. In Brazil, a group of cagebird fanciers proposed the Rufous-bellied Thrush as the national bird, although they were ultimately thwarted by a counter-proposal for something more colourful, if less pleasant to listen to, the Golden Parakeet (*Guarouba guarouba*). Species chosen as "State birds" in the USA include the American Robin in Connecticut, Michigan and Wisconsin, the Wood Thrush in District of Columbia, the Hermit Thrush in Vermont, the Mountain Bluebird in Idaho, and the Eastern Bluebird in Missouri and New York.

National and state birds are, in their way, birds of good omen. The Indian Robin is considered a good omen among certain Rajput clans, and therefore held as sacred. Among the Iban people of Borneo the White-rumped Shama is always auspicious owing to its habit of keeping near longhouses, which implies an intimate interest in human affairs. Similarly, the White-crowned Wheatear is revered by the desert nomads of north Africa, within whose camps it moves freely, searching for scraps and picking ticks off livestock; it gave its Arabic name, *zarzur*, to the semi-mythical oasis Zerzura, thought to be Wadi Abd El Malik in the Gilf Kebir of Libya, where lost treasures were sought by various Europeans in the 1930s, inspiring the plot-line in the book and film *The English Patient*. All three of these species enjoy the kind of status that the European Robin has with the British, and it is perhaps the simple pleasure of the companionship of these beautiful, trusting species that inspires such warmth of human feeling. Why else do North Americans spend so much on bluebird nestboxes and trails?

One reason why they do so is that the causes and cures of the major post-1950 decline in bluebird numbers across the continent were addressed by scientific research. The need for nestboxes turned bluebirds into local subjects for action, and the provision of boxes allowed the research to focus on the biology of the genus *Sialia*. The three bluebird species have, as a consequence, yielded a great deal of information of value to science generally on the processes of sexual selection and sperm competition. Their important contribution to the development of biological understanding is, however, by no means the only one made by members of the family.

In Europe, another thrush, the Bluethroat, has emerged as a major test-bed species for evolutionary theory, and, belatedly picking up the trail opened half-a-century ago by D. W. Snow, behavioural ecologists have found in the Common Blackbird another species, right on their doorsteps, amenable to similar experimental study, with particular respect to survival and foraging competitiveness. Farther south, new light has been thrown on sexual selection by the stone-carrying capacities of the Black Wheatear and the singing performances of the Clay-coloured Thrush. The Common Stonechat has proved an ideal species for studying the relative influence of environment and heredity in different life-history strategies in the tropical and temperate zone. Studies of the European Robin have elucidated key issues over the value and use of territory in relation to avian survival, food supply and breeding performance. Common and Thrush Nightingales have yielded new information on song-repertoire development, storage and deployment in birds, and on fat-deposition patterns during migration. The American *Catharus* and *Hylocichla* thrushes have been leading subjects of research on the effects on animal populations of habitat fragmentation, and, again, on the energetics of migration. The Fieldfare has been instrumental in the exploration of anti-predator breeding strategies and their evolution. Moreover, it was the die-off of American Robins after DDT was used to control Dutch elm disease on the Michigan State University campus, in the mid-1950s, that alerted scientists to the long-term effects of chlorinated hydrocarbons in the environment. Indeed, so much are thrushes and chats used as experimental subjects by biologists that there is now a growing body of studies that examine the effects of these very studies themselves!

Status and Conservation

Of the 336 species of thrush and chat currently recognized, six are classed as Critical, seven are Endangered and 23 are Vulnerable, representing respective percentages of 1·8%, 2·1% and 6·8% of the family's members. A further 26 species, 7·7%, are considered Near-threatened. These proportions are well in line with the global figures for birds, in which Critical species make up 1·9% of the world's avifauna, Endangered species 3·3%, Vulnerable ones 6·9% and Near-threatened ones 7·4%. Thus, only the figures for Endangered turdids differ distinctly from the global percentage. In addition, of all the 9925 bird species extant in AD 1500, 128, or 1·3%, are now extinct. Among the thrushes and chats, the percentage is 0·6%, two species, although it would be 0·9% or 1·2% with the addition of one or both of two doubtful cases.

What are these species, and what are their characteristics? The extinct species are the Grand Cayman Thrush (*Turdus ravidus*) and Kittlitz's Thrush (*Zoothera terrestris*), the last also known as the Bonin Thrush. The Grand Cayman Thrush was an exquisite pale grey thrush with a vermilion bill, eyering and legs. It lost its scrub and mangrove habitat in the first half of the twentieth century, and promptly became extinct. Kittlitz's Thrush was discovered in 1828 on Chichi-jima, the largest island of the Ogasawara-shoto, or Bonin Islands, south of Japan. Following much disturbance and the introduction of rats (*Rattus*), it had disappeared by 1889. Both of these cases were outlined in E. Fuller's foreword to Volume 7 of the *Handbook of the Birds of the World*.



It is an apt reflection of the dreadful crash of Hawaii's avifauna that of four endemic solitaires three are considered Critical, two of them probably extinct, while the ***Omao*** *is viewed as something of a success story. In the 1890s this species was abundant and widespread, but a century later its range had contracted to 25-30% of its former extent, its population was doubtless a fraction of its original size, and it was classified as Vulnerable. Nonetheless, it seems to have endured the same litany of threats that exterminated its congeners, chiefly habitat destruction and disease, and with continued protection it seems likely to survive.*

[*Myadestes obscurus*, Hawaii Volcanoes National Park, Hawaii. Photo: R. & N. Bowers/ VIREO]



Restricted to the Eastern Zimbabwe Mountains and Tanzania-Malawi Mountains Endemic Bird Areas, ***Swynnerton's Robin*** *is thought to be declining rapidly in a small range and thus meets the requirements for treatment as Vulnerable. Although generally rare and very patchily distributed, it remains common at a few localities, including Zimbabwe's Chirinda Forest and Mozambique's Mt Gorongoza, both of which require urgent and effective protection to arrest the loss of key habitats to cultivation, logging and firewood collection.*

[*Swynnertonia swynnertoni swynnertoni*, Vumba, Mutare, Zimbabwe. Photo: Geoff McIlleron]

Not included in Fuller's foreword was the Amaui ("*Myadestes woahensis*"), a form known from a single specimen collected on Oahu, in the Hawaiian Islands, in 1825, at which time it was reported by its discoverer to be common in the forest; the cause or causes of its extinction are unknown. The specimen is of a juvenile, and it is very like juveniles of the race *rutha* of the Olomao. It is dark brown above, with pale buff dots and flecks, has a greyish throat slightly flecked brown, and has whitish-buff underparts with broad dark brown scalloping, perhaps more extensive than in *rutha*; the wings and tail are plain grey-brown. An adult specimen was obtained at the same time. Although the present whereabouts of this are uncertain, a skin in the collection of the Academy of Natural Sciences of Philadelphia, in the USA, is thought very likely to be this specimen. This differs from the adult Olomao only in having a longer tail. In view of the evidence, admittedly incomplete, it seems probable that the Amaui was, in fact, no more than a subspecies of the Olomao.

Although Fuller included another supposed turdid, the Bay Thrush ("*Turdus ulietensis*"), this may not even have been a thrush. Fuller reports that it had "a notch in its bill", and its only home, Raiatea, in the Society Islands, where it was reported in June 1774, is a long way east of any other thrush-inhabited islands in the South Pacific. H. D. Pratt and co-authors make the very plausible point that the bird was more probably an *Aplonis* starling, and it is discounted hereafter in this discussion.

Among the 36 globally threatened members of the Turdidae, the Critical species are the Kamao (*Myadestes myadestinus*), Olomao, Puaiohi, Taita Thrush, Somali Thrush and Seychelles Magpie-robin. The Endangered turdids are the La Selle Thrush (*Turdus swalesi*), Spotted Ground-thrush, Thyolo Alethe (*Pseudalethe choloensis*), Sri Lanka Whistling-thrush, Gabela Akalat, Usambara Akalat and Black Shama (*Copsychus cebuensis*). It is worth considering these two classes and the extinct species together. The most obvious feature of the three lists is the influence of insularity on the degree of their conservation status. Both (or all) of the extinct thrushes were found on remote, or relatively remote, small islands, and four of the six Critical species are likewise; but none of the seven Endangered thrushes is, although three are insular. The two other Critical species and all seven Endangered species have small natural ranges rendered tiny by anthropogenic deforestation.

The Vulnerable species are the Omao, Sumatran Cochoa (*Cochoa beccarii*), Javan Cochoa (*Cochoa azurea*), Izu Thrush (*Turdus celaenops*), Grey-sided Thrush, Yemen Thrush, Forest Thrush, Ashy Thrush (*Zoothera cinerea*), Guadalcanal Thrush, Bicknell's Thrush, Rusty-bellied Shortwing (*Brachypteryx hyperythra*), Malaysian Whistling-thrush (*Myophonus robinsoni*), Swynnerton's Robin, East Coast Akalat, Iringa Akalat, White-headed Robin-chat (*Cossypha heinrichi*), Black-throated Blue Robin, Rufous-headed Robin, Luzon Water-redstart (*Rhyacornis bicolor*), Nilgiri Blue Robin, White-bellied Blue Robin, Stoliczka's Bushchat (*Saxicola macrorhynchus*) and Hodgson's Bushchat. Here, things change somewhat. There are four insular forms with tiny ranges, the Omao and the Izu, Forest and Guadalcanal Thrushes; two continental forms, the bushchats, with diminishing ranges owing to grassland modification; and an insular waterside redstart with too disturbed a habitat. The 16 remaining species have small natural ranges that have been made smaller, but not tiny, by deforestation; 15 are continental, including the Greater Sundas, and one is insular.

The Near-threatened thrushes and chats are the Cuban Solitaire, Geomalia, Gulf of Guinea Thrush, Unicoloured Thrush (*Turdus haplochrous*), Tristan Thrush, Slaty-backed Thrush (*Zoothera schistacea*), Buru Thrush (*Zoothera dumasi*), Seram Thrush (*Zoothera joiceyi*), Red-backed Thrush (*Zoothera erythronota*), Red-and-black Thrush (*Zoothera mendeni*), Chestnut-backed Thrush (*Zoothera dohertyi*), Orange-banded Thrush (*Zoothera peronii*), Everett's Thrush (*Zoothera everetti*), Crossley's Ground-thrush, Oberländer's Ground-thrush (*Zoothera oberlaenderi*), Spot-winged Thrush, Fawn-breasted Thrush, New Britain Thrush, Benson's Rock-thrush, Angola Cave-chat, Firethroat, Rufous-tailed Shama (*Trichixos pyrropygus*), Przevalski's Redstart, Fuerteventura Stonechat, White-bellied Bushchat and Chestnut-naped Forktail. Here, things change again. Of these 26 species, no fewer than 16 are insular forms, and only eight are continental, taken here as including the Greater Sundas and Madagascar.

So, nearly 80% of the Extinct and Critical turdids are insular, whereas 43% of the Endangered species and only 26% of the Vulnerable ones are; but 61% of the Near-threatened thrushes and chats are insular species. What is happening? The relationship between high levels of endangerment and insularity is well



*The **Grey-sided Thrush** breeds in a limited area of montane forest in north-east China, and migrates south-westward in the non-breeding season to similar habitats in north-east India, Myanmar and northernmost Thailand, where this photograph was taken. The summer and winter ranges encompass vast areas of inaccessible or rarely visited terrain and the total population is very difficult to judge. It is estimated at fewer than 10,000 birds, and declining, an assessment which triggers classification as Vulnerable. Further surveys are required to clarify its distribution, especially in the breeding range, where protected areas need stronger management.*

[*Turdus feae*, Doi Inthanon National Park, Thailand. Photo: Suppalak Klabdee]

established. Although more than 80% of all bird species have continental distributions, no fewer than 88% of global extinctions since 1500 have occurred on islands, owing to a combination of factors including natural small range and population sizes, habitat loss, exploitation and, most crucially, lowered defence and competitive mechanisms against introduced animals. Indeed, the greater the isolation of an island in both space and time, the sharper the susceptibility of its native wildlife, Mauritius and Hawaii being notorious examples. In this respect, it is worth noting that several subspecies of the Island Thrush, the nominate race from Norfolk Island, *vinitinctus* from Lord Howe, and *mareensis* and *pritzbueri* from the Loyalties in New Caledonia, have disappeared from the smallest, most ravaged islands in the species' wide range.

Lesser levels of threat, albeit real ones, are experienced by continental species, sometimes simply because they have larger ranges and populations, but more importantly because, even when just as constrained in these two variables, they are much less affected by the evolutionary process which automatically alters the behaviour and competence of insular forms. Nonetheless, what emerges in the list of 36 Critical, Endangered and Vulnerable species of thrush and chat is just how many of them, 18, or 50%, occupy what may be termed "ecological islands", small, isolated tracts of forest usually situated on ranges of mountains or hills. With highly restricted ranges and encroaching human populations, species in these circumstances inevitably run an elevated risk of extinction: not only do they occur within a very small area, but they also, as a consequence, possess very much lower population sizes than those of most wider-ranging species, so that their security must be a matter of permanent human vigilance. Indeed, of all the Extinct, Critical, Endangered and Vulnerable thrushes and chats, only three can be said to have an area of occupancy that is not highly constricted. These are the Grey-sided Thrush and Stoliczka's and Hodgson's Bushchats.

This helps to explain why the complement of Near-threatened species reverses the trend of a decreasing proportion of insular forms with decreasing level of threat. The remaining continental species have ranges too large or, if they are small, habitats too secure to allow them to approach the criteria for being at risk. What emerges in the Near-threatened list is, instead, a suite of birds which are restricted to *relatively* large, *relatively* secure islands, few of which are very isolated, and, thus, with species less likely to fall victim to introduced animals; but nevertheless islands on which human enterprises are starting to, or have the capacity to, exert a negative and disruptive influence. So, again, there is a small-range/small-population factor in these listings, but it is not so pronounced, nor are the evolutionary circumstances of the species in question so precarious. It is worth noting here, however, that three of them, the Red-backed, Red-and-black and Chestnut-backed Thrushes, are listed not because of habitat destruction, but because of the trapping of *Zoothera* thrushes in their particular region of Indonesia, a trade so intensive, owing to these birds' singing abilities, that there are real fears for whole populations on certain islands. With the possible exception of the Green Cochoa, not itself a threatened species, no other species of thrush or chat faces human trade exploitation as a major threat, and probably only a minority even experience trade at all.

The taxonomic composition of the 64 extinct, threatened and Near-threatened species is uneven. Although the family Turdidae, as presently constituted, breaks down as 20 Myadestinae, 133 Turdinae and 183 Saxicolinae, respectively 6%, 40% and 54% of the total species, the above 64 are made up of five myadestines, 31 turdines and 28 saxicolines, which correspond to 8%, 48% and 44%. Thus, the chats emerge as considerably less extinction-prone than the myadestine and the true thrushes, which can immediately be related to their comparatively weak ability to colonize oceanic islands. Moreover, it is at once apparent that certain genera are far more susceptible than are others. This is demonstrated in the following analysis, in which the figures in each case include the extinct forms. Sixty-four extinction-prone species out of 338 represents 19% of the family, but *Zoothera*, with 17 of its 36 species globally threatened or Near-threatened or extinct, has a 47% level of susceptibility, *Myadestes*, with five out of 12 species, a 42% level, *Sheppardia*, with four out of ten species, a 40% level, and *Saxicola*, with four out of eleven species, a 36% level of susceptibilty. The genus *Turdus*, on the other hand, with nine out of 71 species thus classified, has only a 13% level of susceptibilty, and *Phoenicurus*, with just one out of 11 species, a 9% level, while the large genus *Oenanthe*, containing 21 species, notably achieves 0%.

The recent susceptibility of *Myadestes* is clearly related to its early success in colonizing islands, and the same applies to



*The **Sri Lanka Whistling-thrush** is classified as Endangered because it is restricted to a small range in the forested highlands of Sri Lanka, where habitat loss continues. Fewer than 2500 mature individuals are thought to survive, although this estimate is based on rather a lot of guesswork, and may be unduly pessimistic. However many birds are involved, their limited habitat is being cleared to make way for agriculture and timber plantations, and the forest streams along which they live are being polluted with chemical run-off from upland farms. Strict protection and expansion of reserves are important steps towards conserving this species for perpetuity.*

[*Myophonus blighi*, Nuwara Eliya, Sri Lanka. Photo: Edward Vercruysse]

Zoothera, with 13 of its 17 extinction-prone forms being insular, and even *Saxicola*, two of the four such forms of which are insular species. *Sheppardia* has, instead, been successful in colonizing and speciating in "forest islands", some of which are particularly small and therefore inherently vulnerable. *Turdus* thrushes, in contrast, have simply been successful; their full settlement of four continents is matched among the passerines only by the pipit genus *Anthus* and, if different continents are allowed, by *Corvus* and by the swallow genus *Hirundo*, and they are usually relatively common and robust components of an avifauna. *Phoenicurus* and *Oenanthe* are both emphatically island-averse, the former at its most speciose in the relatively secure mountains of Asia, while the latter divides up the northern Old World's boundless drylands, where threats exist but are apparently not sufficient or of the appropriate type to trouble the future of these hardiest of species.

This may change when the conservation status of the Chestnut-rumped Wheatear is formally assessed against the IUCN criteria. This taxon has been treated as a separate species before, but ephemerally; it has an unusually small range for a wheatear, being confined to eastern Turkey and western Iran, it seems to be uncommon, and little is known about it, classic conditions for Near-threatened status. The same is true of the Sumatran Whistling-thrush (*Myophonus castaneus*), recently split from the Javan Whistling-thrush (*Myophonus glaucinus*); the Sumatran taxon seems to be very local within its restricted and steadily diminishing montane forest habitat. A third potentially Near-threatened turdid is the Rufous-brown Solitaire of South America, a bird with an extraordinary relict distribution, insufficiently protected and feebly understood.

Two examples involving Neotropical thrushes illustrate the importance of solid information in making conservation assessments, or, at least, the danger of depending on assumption, however reasonable. The first is the work done by J. V. Remsen in analysing the winter distribution of the Veery by using dated museum specimens. Previous research, some of it quite detailed, had plotted the localities for the species across the South American continent, and had then mapped the winter range by shading over the dots; the result implied that the Veery has a very broad winter range, commensurate with that in summer, and that its populations would therefore be relatively unaffected by deforestation. Remsen, however, also *dated* his dots. What he found was that, of 105 specimens, 91 had been taken during what were still essentially the autumn and spring migration periods, that only 14 specimens existed for the period December–February, and that all these latter grouped in a relatively constrained range in south-central and south-eastern Brazil. These are areas of rapid deforestation, and suddenly the Veery emerges as a species over which a new vigilance is needed. The second example involves the Grand Cayman Thrush. After expressions of concern over its status in 1916, one was seen in 1938, during an Oxford University expedition focusing on other biota. Evidently in response to this information, J. Bond, the father of Caribbean ornithology, concluded in print, two years later, that, while the species was rare and local, it was "probably in no immediate danger of extinction". Alas, it was never seen again.

There is also the example of the Fuerteventura Stonechat. Up to the mid-1980s no work had ever been done on the species, and N. J. Collar, assembling and reviewing the available evidence, which was mostly 50–100 years old, concluded, in a supposedly well-informed guess, that as few as 50–150 pairs might remain. He classified it as globally threatened. In response to this, C. J. Bibby and co-workers undertook a survey of the species and determined, through quantification and extrapolation, that its true population was 650–850 pairs; this, in turn, stimulated still more work, which concluded that as many as 1300 pairs might exist on the island. There is, then, immense difficulty in assessing the status of even open-country thrushes and chats, even in relatively confined spaces. Moreover, in the case of the Fuerteventura Stonechat, populations may fluctuate strongly with annual rainfall, so that baseline figures may vary from decade to decade, if not from year to year. In forest habitats, the situation can be still more challenging. Species such as the Equatorial Akalat and the Brown-chested Alethe are extremely retiring and unobtrusive, and it is often possible to assess their abundance, and sometimes even to confirm their presence, only through the use of mist-nets.

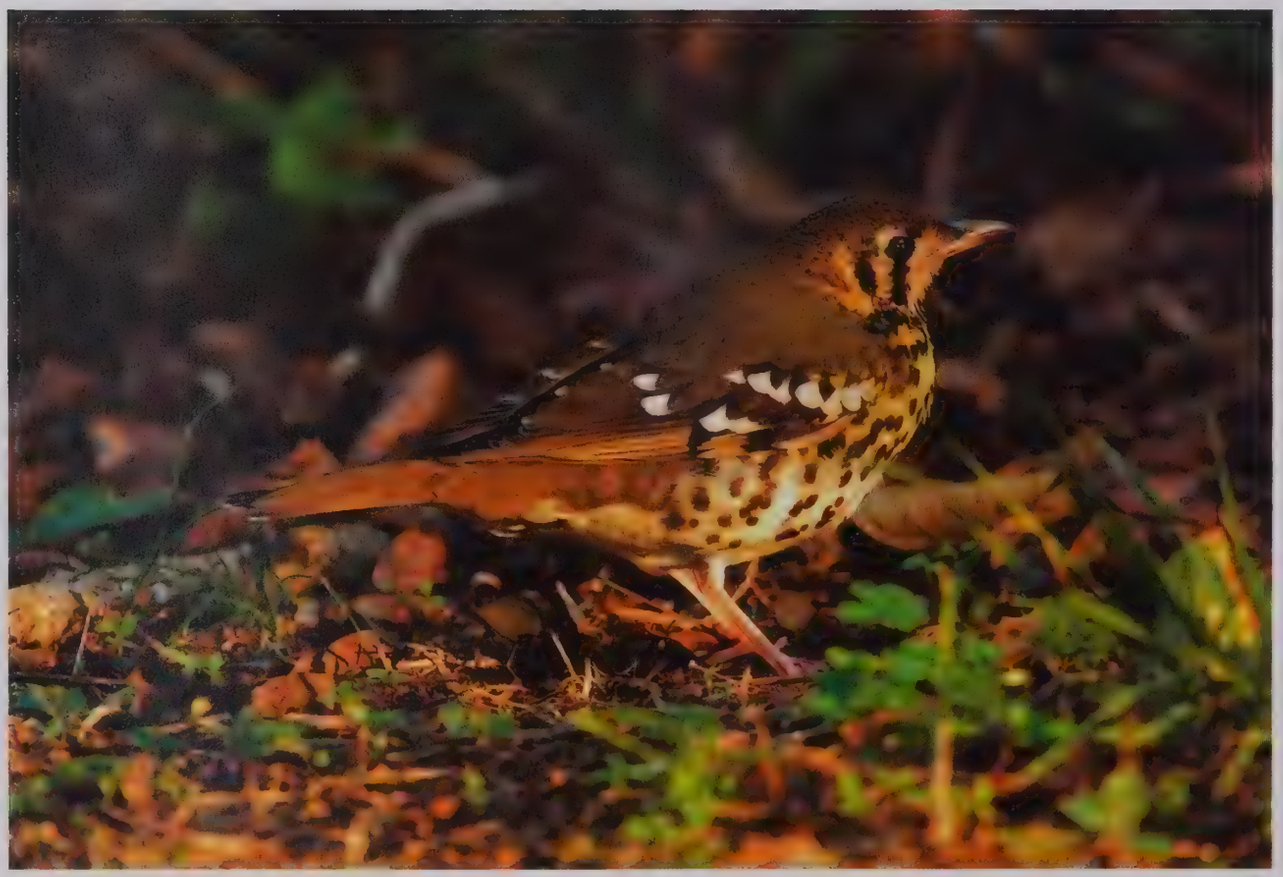
Of course, even if Bond had concluded that the Grand Cayman Thrush was in the direst of plights, which he had no strong reason to believe, it is almost certain that nothing would have been done to save it. The science, techniques, materials, skills, institutions and *ethos* were not in place in the 1930s, and certainly not where a species of ambiguous status on a remote Caribbean is-

land was involved. The Grand Cayman Thrush disappeared half a century too soon. It was, at any rate, only in the 1970s that moves to examine the ecology and needs of several other highly threatened turdines began. The Seychelles Magpie-robin, reduced to 20 or fewer individuals and confined to a single tiny island, Frégate, became the subject of increasingly intensive work and required various management actions. These included ridding the island first of cats and, later, of rats, transforming tracts of woodland and garden into suitable habitat, preventing the use of domestic insecticides, and controlling invasive Common Barn-owls (*Tyto alba*) and Common Mynas (*Acridotheres tristis*), as well as the provision of nestboxes and supplementary food, and the translocating of birds to other suitable islands, where many of the above measures needed to be repeated. No less important in this case, however, has been the growth in the institutional capacity to maintain this work. From a virtual "one-man show", by the pioneering J. Watson, in the 1970s, with the backing of ICBP, the forerunner of BirdLife International, the programme developed into a BirdLife-led recovery effort involving the Royal Society for the Protection of Birds and BirdLife Seychelles, the latter taking the lead since 1998. There were 140 Seychelles Magpie-robins in mid-2004.

Conservation work on the Hawaiian thrushes, beginning in the 1970s, appears to have come too late to help two of them. The Kamao, once the commonest forest bird on Kauai, has not been seen for at least ten years, and the Olomao, with three of its four subspecies accepted as extinct, has not certainly been seen on Molokai for at least twice as long. While even a small chance of their survival exists, however, the effort to control the factors judged to harm them should continue. Indeed, what such effort can achieve is exemplified by the case of the third Critical species, the Puaiohi, for which a suite of actions not dissimilar in general scope to those deployed for the magpie-robin is beginning to produce results. The Puaiohi has proved a little bit more resistant than the Kamao and the Olomao to habitat destruction and to the effects of disease vectored by introduced mosquitoes (Culicidae), but these are real threats compounded by the spread of feral pigs into its range, thereby creating better conditions for mosquitoes, and by the impact on nests of introduced rats. All of these introduced animals need ideally to be excluded, so far as is possible, from the Alakai Wilderness Preserve, the species' only home. The pigs are probably the easiest to deal with; nests can at least be baited in order to prevent rat predation; and there are signs that the birds may be developing resistance to the avian malaria that the mosquitoes carry. Meanwhile, a captive population of Puaiohis has been established as a reservoir and source for the restocking of appropriate areas.

More recently, ground-breaking work, combining evolutionary theory and a detailed population ecological study, has been undertaken by L. Lens and co-workers on what might be called a pseudo-insular species, the Taita Thrush. This turdid, distributed among three cloudforest fragments in the Taita Hills of Kenya, is in almost as serious a state as that of some of the Hawaiian thrushes. The study concentrated on fluctuating asymmetry, which is random deviations from perfect symmetry in bilaterally symmetrical traits such as paired limbs. When developing in stressful circumstances, individuals may be forced to allocate more resources to simple survival, at the expense of producing perfectly symmetrical structures, and an individual's degree of asymmetry is thought, therefore, to give such indication of the degree of environmental adversity endured during its development. So, could degree of asymmetry provide an easily measured indicator of how individuals in threatened populations are faring? The situation with the Taita Thrush indicates that it could: individuals with more asymmetrical tarsi survive less well than do others, suggesting that asymmetry is, indeed, able to provide reliable information about the condition of individuals. Moreover, the most asymmetrical thrushes occur in the most disturbed of the three forest patches, and the least asymmetrical in the least disturbed. Furthermore, survival is lower in the most disturbed patch, but there is no difference in this respect between the moderately and least disturbed patches. These patterns imply that the degree of asymmetry in morphological characters could serve as an early-warning system in conservation, by identifying populations under the greatest environmental stress.

More generally, among seven forest species studied intensively in the Taita Hills, also including the White-starred Robin, individuals in more disturbed forest patches were four to seven times more asymmetrical with regard to tarsus length than were those in less disturbed patches. In addition, a comparison of meas-



The rarest Zoothera *thrush, and the only one accorded Endangered status, is the elusive* ***Spotted Ground-thrush****. It is thinly distributed in forests along the eastern seaboard of Africa, where it is generally rare and local, but seasonally common at some sites, such as Arabuko-Sokoke, Kenya, and forest patches near Durban, South Africa. Nonetheless, the global population is not thought to exceed 2500 individuals, with a general downward trend due to low breeding success, high mortality during migration periods, and the inexorable loss of coastal woodlands and upland breeding sites.*

[*Zoothera guttata guttata*, Zululand.
Photo: HPH Photography/ Photo Access]

urements of museum specimens collected in the 1930s and 1940s with those of live birds mist-netted in the 1990s revealed that the degree of asymmetry considerably increased in the most degraded forest fragment, but did not increase in the least degraded patch. The dispersal rates of species, combined with their sensitivity to disturbance, as reflected by their degree of asymmetry, appear also more generally to predict the proportion of forest patches that they inhabitat. Of the nine species studied, Taita Thrushes are among the most sensitive to forest disturbance, showing a degree of asymmetry second only to that of the Stripe-cheeked Greenbul (*Andropadus milanjensis*).

The key messages coming out of these conservation studies and last-gasp endeavours are that, first, species *can* be saved with enough will-power, commitment and resources, but that, second, it is crucially important not to let them slip so close to the edge of extinction in the first place. This means that, while the targets of further conservation work should continue to be other insular or pseudo-insular species, since without such intervention most of them are likely to become the next "Hawaiian thrushes", there should nonetheless be a concerted programme of monitoring and management for the non-threatened species as well, to check that these relatively common species are maintaining their numbers. Such work is widespread in North America, where a great deal of research has focused on the problem of habitat fragmentation and its effects, in particular through levels of nest predation and brood-parasitism by cowbirds, on populations of forest thrushes. Some of these turdids, notably the Veery and Swainson's Thrush, are judged to be in decline. It is widely believed that large areas of intact forest are major "source" habitats, where productivity exceeds mortality and hence supplies recruits to neighbouring habitats, whereas small woodlots and patches intersected (or with the perimeter lengthened) by clear-cuts are considered "sinks", where mortality exceeds productivity and hence drains birds from neighbouring habitats. This seems to hold for the mostly ground-nesting Hermit Thrush. For the tree-nesting Wood Thrush, however, there is recent evidence that large areas of habitat may be capable of only moderate levels of surplus productivity, that medium-sized areas which should, in theory, produce surpluses do not do so, but that, at least in some areas, small woodlots can, after all, be important sources for the species. The parallel question of the negative influence of deforestation in the species' winter ranges continues to be raised, but research on this topic is far less developed.

So great have been the advances in understanding of the ecology of North America's thrushes, and so great have been the concerns for them, that in 2003 the Cornell Laboratory of Ornithology issued *A Land Manager's Guide to Improving Habitat for Forest Thrushes*. Key recommendations include the maintenance of large, intact forest blocks, the promotion of understorey growth, and the prevention of overbrowsing by deer and livestock, as well as, in the western USA, the protection and enhancement of riparian growth. If these prescriptions are followed with the zeal with which North Americans took up the cause of the bluebird in the 1970s (see Relationship with Man), the thrushes should prosper, so long as their winter quarters are also protected. Thirty-plus years ago, concern over the chronic decline of bluebirds in the face of House Sparrow evictions and natural habitat loss led to the foundation of the National Association for the Protection and Propagation of the Purple Martin and Blue-birds of America. This, and such contributions as L. Zeleny's *The Bluebird: How You Can Help its Fight for Survival*, published in 1976, made the recovery of bluebird populations a strongly citizen-led initiative. Provision of nestboxes has been immensely successful, and human pleasure at the presence of these particularly attractive birds has meant that nestbox "trails" and programmes have become attractive to many members of the public not otherwise particularly motivated for birds or conservation. Even so, there may be a cost elsewhere: in Arizona, increases in abundance of cavity-nesting birds following the deployment of nestboxes were accompanied by decreases in the abundance of open-nesting birds, possibly as a result of interspecific competition for food resources.

Lack of nest-sites is certainly a constraint on hole-nesting species of thrush and chat around the world, and can strongly depress breeding numbers. It can, of course, be particularly acute when there is competition from another species, especially an alien, but it occurs commonly in woodlands where management disfavours old trees. Provision of nestboxes for such species as the Common Redstart is often, therefore, vital to counteract these deleterious effects. Even outside woodland, the importance of nesting holes can be dramatically demonstrated. As an example, H. E. Axell, by



*The **La Selle Thrush**, an Endangered species possibly numbering fewer than 2500 individuals, is endemic to the Caribbean island of Hispaniola, which is subdivided into two rather different political entities: the Dominican Republic, and Haiti. Their fates, and that of this rare thrush, are inextricably linked, particularly as Haiti is the poorest, and perhaps least stable, of New World countries. Its natural forest cover has been almost entirely eliminated, and its protected areas are ineffective. Fortunately, the Dominican Republic is relatively secure, and its parks provide the best hope for conserving this thrush.*

[*Turdus swalesi*, Sierra de Bahoruco National Park, Dominican Republic. Photo: Doug Wechsler/ VIREO]



*The population size of the **Common Scaly Thrush** on the Japanese island of Amami is unclear, but the most optimistic estimate is that 75 pairs survive in the last remaining 10–15 km² of mature broadleaved forest. The resident race* major *is distinguished by its larger size and a few subtle morphological features, including heavier mottling on the face and a bare pink area behind the eye, visible here. These differences are sufficient in the eyes of some taxonomists to justify treatment as a separate species, the Amami Thrush, in which case it is classified as Critical. This is an example of a rather common scenario wherein systematics plays a crucial role in adjusting conservation priorities.*

[*Zoothera dauma major*, Kagosima, Japan. Photo: Hirozo Maki]

the simple expedient of half-burying old ammunition cans measuring 36 × 18 × 9 mm along a stretch of shore at Dungeness, in south-east England, contrived to increase the local post-war population of Northern Wheatears from 26 pairs to 70 pairs.

While research into population declines of North American thrushes has focused mainly on forest diminishment on the breeding and wintering grounds, research into the declines of European thrushes, which utilize mixed habitats to a greater extent, has focused primarily on the intensification of agriculture. For example, work on Song Thrushes in Britain has shown that changes in the survival rates of first-winter individuals, and perhaps also of juveniles in the post-fledging period, are sufficient to account for the decline of the species since the mid-1960s, but the driver of this altered rate remains elusive. Modern farming practices of various types, notably undersoil drainage, may be tipping the balance against younger thrushes, or, alternatively, that balance may be shifting because of factors elsewhere.

Research in Britain has also, for instance, disclosed a worrying long-term trend of eggshell thinning among Common Blackbirds, Song Thrushes, Mistle Thrushes and Ring Ouzels. This is not related to the stepwise decline in the thickness of eggshells of European raptors recorded in the 1960s, which was clearly a physiological response to their accumulation of organochlorine-pesticide residues, and which led to major declines in some species owing to chronic loss of recruitment as a result of eggshell breakages during incubation. For thrushes, the trend dates back at least 150 years, and, while it is not yet known to have had any negative impact on populations of the species concerned, it is a phenomenon that needs to be explained before too long. One suggestion is that "acid rain" has depleted the amounts of calcium in prey items, but in the Netherlands, where soils are rather less sensitive to acidification, precisely the same trend has been identified. Taking its cue from this work, however, recent analysis in the USA reveals a strong, highly significant, negative effect of acid rain on the predicted probability of breeding by the Wood Thrush, and that this effect intensifies at higher elevations with low-pH soils and habitat fragmentation. Pesticides have been investigated for their effects on American Robin populations in commercial orchards and in suburban environments where ornamental trees are treated. To date, however, the evidence is equivocal.

Many migrant birds, including thrushes and chats, are exposed to potentially terrible risks at tall buildings. In 1995, for example, 600 Redwings were killed in one night at the lighthouse at Bardsey, in Wales. Such incidents, fortunately, are mostly isolated ones. On the other hand, the proliferation of television transmission masts and cellphone towers in parts of the USA is a wider cause for concern, Swainson's Thrush being among the commonest casualties at such structures. Data compiled by the American Bird Conservancy indicate that, of all birds killed at large structures, Swainson's Thrushes account for 2·1%, Grey-cheeked Thrushes for 1·0%, Veeries for 0·8% and Wood Thrushes for 0·4%. The Fish & Wildlife Service has estimated that 5 million to 50 million bird deaths per year are caused by building. If this holds, then Swainson's Thrush would suffer 105,000–1,050,000 casualties annually, and even the Wood Thrush would lose 20,000–200,000 individuals.

Some species of thrush can, nevertheless, adapt over time to human environments, when not being asked to fly through them at night. At Port Louis, in the Falkland Islands, Austral Thrushes were already making use of sheds as nest-sites in 1833, as Darwin himself observed. This was at a stage before the Common Blackbird had really become an urban species in Britain. Its colonization of cities appears to have begun in western Europe around the mid-nineteenth century, spreading east and south. In what is now Israel, for example, it bred in natural woodlands throughout the nineteenth century, but widespread felling in the first 20 years of the twentieth century led to its disappearance from many areas, and in the period 1920–1940 it bred only in Galilee and Carmel and locally along the coast. With the foundation of Israel, however, many agricultural schemes and settlements were set up, creating gardens, orchards and citrus groves, and afforestation programmes. Common Blackbirds rapidly recolonized these areas in the 1950s and, assuming a momentum of their own, invaded Judea and the southern coastal plains in the 1960s, in the 1970s entering all parts of the Jordan Valley south to Jericho, and in the 1980s penetrating the northern Negev Desert. The spread into the region of this glorious songster and charming garden companion must count as one of Europe's less orthodox, but perhaps more successful, contributions to the quality of life in the Middle East.

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*A less contentious scenario is that of the **Seychelles Magpie-robin**, a species that declined to an all-time low of 12–15 birds on Frégate in 1965, a slump in numbers that nearly consigned it to extinction. Fortunately, it was rescued by a programme of active management and translocations to suitable islands. By mid-2004, this had resulted in 67 birds on Frégate, 36 on Cousin, 22 on Cousine, and 15 on Aride: a global total of 140. The Seychelles Magpie-robin remains listed as Critical, but it is nonetheless a heartening example of what can be achieved when tiny, imperilled populations are carefully managed. The bird seen here is the male of the first pair introduced to Aride.*

[*Copsychus sechellarum*, Aride, Seychelles. Photo: Olivier Langrand/ Bios]

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Subfamily MYADESTINAE

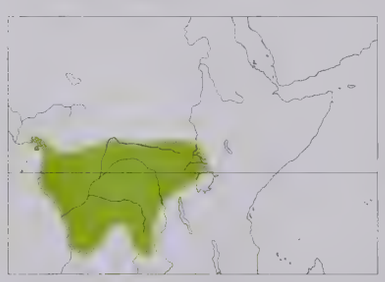
Genus *STIZORHINA* Oberholser, 1899

1. Rufous Flycatcher-thrush

Stizorhina fraseri

French: Stizorhin de Fraser **German**: Kurzlaufdrossel **Spanish**: Zorzal de Fraser
Other common names: Rufous Thrush, Rufous Flycatcher, Fraser's Rusty Flycatcher

Taxonomy. *Muscicapa Fraseri* Strickland, 1844, Bioko.
Genus often merged with *Neocossyphus*; the two form a group which, in turn, is most closely related to New World *Myadestes*. Close relationship to *S. finschi* supported by phylogenetic analyses; hybridization occurs in Nigeria, suggesting that it may be more appropriate to regard the two as conspecific, but present species does not repond to playback of *S. finschi* elsewhere. Three subspecies recognized.
Subspecies and Distribution.
S. f. fraseri (Strickland, 1844) – Bioko I (Fernando Póo).
S. f. rubicunda (Hartlaub, 1860) – SE Nigeria E to N DRCongo, S to Angola and NW Zambia.
S. f. vulpina Reichenow, 1902 – S Sudan, NE DRCongo and Uganda.



Descriptive notes. 18–20 cm; 27–44 g. A short-billed, short-legged and rather stout, flycatcher-shaped thrush with a noticeably upright posture; has the habit of flirting the outer tail. Nominate race has greyish-brown head, rufous-brown mantle to lower back and scapulars, brighter chestnut rump; olive-brown wings, with rufous-tawny wingbar above and rusty-buff diagonal bar below; olive-brown tail with rufous-tawny outer feathers; throat greyish, rest of underparts rich tawny; bill blackish, with pale lower base; legs pale brown. Sexes similar. Juvenile is duller and darker. Race *rubicunda* is slightly paler than nominate; *vulpina* has paler tail than other races. VOICE. Territorial song a series of 4–5 high ascending whistles, "wiii-wiii-wiii-wiii", in countersinging a faster, shorter "wiit-wiit-wiit-wiit", in more direct conflict a hoarser vibrant "swit-swit-swit-swit-swit"; in courtship a subdued phrase, commonly beginning with loud trill. Calls include a slow series of 3–4 slightly ascending whistles, "weeeee-ee-eee-eeeee", as contact between pair-members, up to 7–8 series in 30 seconds; short "siit" on take-off; also feeble vibrant ascending "sweet" in anxiety, louder "weez weez weez" version as alarm, and hoarse scolding "tswit-tswit-tswit" when mobbing; calls often accompanied by lifting and spreading of tail.
Habitat. Lowland primary forest and old secondary growth, typically occupying edge habitats such as light gaps with decaying, snapped-off trunks 5–20 m high, streamsides, dense vegetation with numerous lianas, old plantations (cacao, coffee, banana), gallery forest, overgrown disused agricultural land with old parasol trees (*Musanga*) and gingers (*Afromomum*). Chiefly found in understorey but also middle strata and canopy. Recorded from sea-level up to 1500 m; 0–800 m on Bioko, 700–1500 m in Uganda.
Food and Feeding. Mainly insects c. 1 cm in length, especially ants (Hymenoptera), termites (Isoptera), beetles (Coleoptera) and flies (Diptera), also moths, caterpillars, grasshoppers (Orthoptera) and cicadas (Cicadidae), occasionally small snails and millipedes (Diplopoda); sometimes small fruits. Forages from perch by aerial sallying, taking prey from trunks, foliage, air or, more rarely, ground. Often joins mixed bird flocks, particularly in dry season; attends army-ant swarms, but not habitually.
Breeding. Breeding season closely tied to rains; Aug, Oct and Dec, also breeding-condition female and juvenile recorded in Mar, and spotted young in Apr, in Cameroon; Sept-Mar in Gabon; breeding-condition Sept, Oct, Jan and mainly Mar on Bioko; breeding-condition Feb-Mar in Angola; at least Sept in DRCongo; Apr and Sept in E Africa; Oct in Zambia. Territory c. 4–6 ha. Nest a rudimentary, shallow cup of thin rootlets, moss and leaves, placed 1·6–25 m (usually 10–20 m) above ground in open cavity in trunk, branch or epiphyte roots, once in old nest of *Turdus pelios*. Clutch reportedly 1–2 eggs; no information on incubation period; nestling period 14 days; post-fledging dependence at least 1 month. Two individuals ringed as adults were controlled after 8 years.
Movements. Sedentary in Gabon, and probably throughout range.
Status and Conservation. Not globally threatened. Common, but hard to detect, on Bioko. Common to locally abundant in NE Gabon, with density of c. 22 pairs/km². Common in Itombwe Mountains, in E DRCongo.
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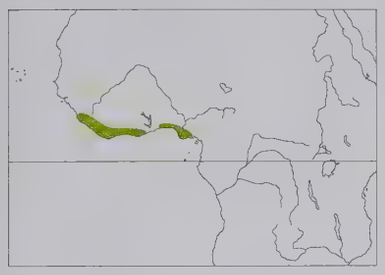
2. Finsch's Flycatcher-thrush

Stizorhina finschi

French: Stizorhin de Finsch **German**: Finschdrossel **Spanish**: Zorzal de Finsch

Taxonomy. *Cassinia finschi* Sharpe, 1870, Fantee, Ghana.
Genus often merged with *Neocossyphus*; the two form a group which, in turn, is most closely related to New World *Myadestes*. Close relationship to *S. fraseri* supported by phylogenetic analyses; hybridization occurs in Nigeria, suggesting that it may be more appropriate to regard the two as conspecific, but *S. fraseri* does not repond to playback of present species elsewhere. Species name often listed as *finschii*, but original spelling is *finschi*, which must stand. Monotypic.

Distribution. Sierra Leone E to Nigeria.



Descriptive notes. 18 cm; 33–44 g. A short-billed, short-legged and stout, flycatcher-shaped thrush with upright posture; habit of flirting outer tail. Has dull grey-brown head, dull rufous-brown upperparts, brighter on rump; brownish wings, indistinct rufous-tawny wingbar above, rusty-buff bar below; dark grey tail with extensive white tips on outer feathers, decreasingly small tips on two adjacent rectrices; dull tawny below, greyer on throat; bill blackish, pale lower base; legs pale brown. Distinguished from very similar *S. fraseri* by duller coloration above and below, less distinct pattern in wings, greyer tail with white outer tips. Sexes similar. Juvenile apparently undescribed. Voice. Territorial song, usually from high (c. 7 m) concealed perch, and given even during middle of day, apparently variable, in Sierra Leone long-drawn whistle of medium to low pitch, a pause of equal length, another similar whistle followed by 2 shorter, somewhat higher notes, generally like that of *S. fraseri* but lower and slower; elsewhere as a slow, mournful syncopated whistling, "whooo… whoo… whoo-peer", also as rapid 4-note "tswi-tswi-tswi-tswi" and as slow 4-note "hooii, hooii hooii-huee", slightly rising, also a throaty, deliberate "tsw-tswii… tswiiii" and long-drawn plaintive "wii… wiiii-iii"; at E end of range hybrids produce intermediate-speed songs. Calls include loud buzzy "wurd-wurd-wurd" when mobbing a raptor, and are lower than those of *S. fraseri*.
Habitat. Understorey and lower canopy (up to 30 m in Liberia) of primary and secondary lowland evergreen and semi-deciduous forest and swamp-forest; prefers densest patches of vegetation. Sea-level to 1500 m; to 900 m in Liberia.
Food and Feeding. Small insects, e.g. ants and wasps (Hymenoptera), termites (Isoptera), beetles (Coleoptera), grasshoppers (Orthoptera), flies (Diptera), bugs and moths. Forages by aerial sallying from perch, taking prey from trunks, foliage and air, rarely from ground. Joins mixed-species flocks, attends army-ant swarms.
Breeding. Little information. Nest material being gathered in Feb–Mar in Nigeria; birds in breeding condition Jun, Sept–Oct and Dec in Liberia and Mar in Ghana.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Rare to locally common. Fairly common in S & C Liberia.
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Genus *NEOCOSSYPHUS*

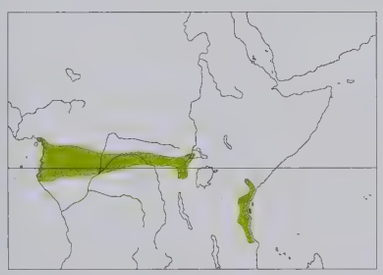
Fischer & Reichenow, 1884

3. Red-tailed Ant-thrush

Neocossyphus rufus

French: Néocossyphe à queue rousse **Spanish**: Zorzal Colirrufo
German: Rotschwanz-Fuchsdrossel

Taxonomy. *Pseudocossyphus rufus* Fischer and Reichenow, 1884, Pangani, Tanzania.
Genus closest to *Stizorhina*, the two forming a group which, in turn, is most closely related to New World *Myadestes*. Two subspecies recognized.
Subspecies and Distribution.
N. r. gabunensis Neumann, 1908 – S Cameroon and Gabon E to N DRCongo and W Uganda.
N. r. rufus (Fischer & Reichenow, 1884) – E Kenya and E Tanzania, including Zanzibar I.



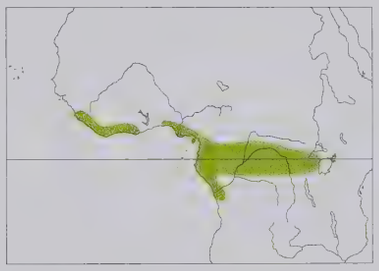
Descriptive notes. 22–25 cm; 53–80 g. Nominate race is rufous-brown, duller and greyer brown on head and upperparts; tail bright rufous except for darker central feather pair; underparts tawny cinnamon, with pale greyish-olive throat; bill brownish-black; legs fleshy to pale brown or purplish-grey. Differs from similar *Stizorhina* species in larger size, longer bill, stronger legs, mostly rufous tail, no pattern in wing; behaviour also different. Sexes similar. Juvenile is duller and browner. Race *gabunensis* is darker than nominate on throat and breast, has clear greyish tinge on breast. Voice. Song consists of 2 clear high even whistles (commonly used as calls, and during aggression at ant swarms) followed by long, high descending trill, "psiii-piii tsisisisisisrrru". Calls include low "wruuw"; sibilant descending "psiiiiiuu", sometimes followed by the first 1 or 2 notes of song, sometimes more complex as "tsip-wi-whiiiiiir"; a series of short crackling "prrr… prrr" trills at ant swarms and on take-off; high whistled "psiii" as contact, and sharp rasping "treet" and thin high "tsiim" as alarm or in anxiety. Difference between calls of races noted in E Africa, *gabunensis* giving sharp crack followed by several rising and falling whistles, ending in chatter, while nominate gives ratchet-like "trrt", often followed by long falling "fweeeee".
Habitat. Floor and lower understorey, occasionally middle strata, of primary lowland forest, rarely adjacent old secondary growth (especially when with mixed-species flocks); nominate race also in riverine and coastal forest; occasionally emerges into open areas adjacent to forest. Recorded from sea-level up to 1400 m; 700–1400 m in Uganda; nominate race up to 900 m, but below 500 m in Kenya.
Food and Feeding. Mainly insects such as grasshoppers (Orthoptera), beetles (Coleoptera), ants (Hymenoptera), caterpillars, but also spiders, small millipedes (Diplopoda) and other terrestrial arthropods; occasionally small snails. Forages on ground among leaf litter and from low branches and stumps, making sallies to the ground; also reported as sally-gleaning above 5 m. Sometimes in small groups. Regular follower of army-ant swarms where available, dominating all smaller bird species; also joins mixed-species flocks feeding away from ants.
Breeding. Little information; only three nests found. Nov in Cameroon and Dec–Jan in Gabon; Apr–May, and breeding-condition bird in Sept, in DRCongo; Apr in Kenya; birds in breeding condition in Sept in Tanzania (Zanzibar) and Oct in Uganda. Nest a slender pad of rootlets, flower stems, tendrils and/or fine plant fibres, with some dead leaves and rodent fur, placed in top of broken-off stump or in large knothole in dead tree, 1·5 m (stump) or 4–10 m off ground. Eggs 2, whitish with rufous-brown spots and blotches; incubation by female; no information on incubation, nestling and post-fledging dependence periods.
Movements. Presumably sedentary. Occasional wandering or dispersal indicated by single records from Central African Republic and S Somalia.
Status and Conservation. Not globally threatened. Rare to locally common. Average density 3–4 pairs/km² in Gabon, where commoner at 800–1000 m than at lower levels. Nominate race fairly common in coastal E Africa.
Bibliography. Bannerman (1953), Borrow & Demey (2001), Britton (1980), Brosset & Érard (1986), Brown (1970), Chapin (1953), Christy & Clarke (1994), Clement & Hathway (2000), Dowsett & Dowsett-Lemaire (1997), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Pakenham (1979), Pasquet *et al.* (1999), Plumptre & Mutungire (1996), Quantrill (1995), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Stuart & Jensen (1985), Svendsen & Hansen (1995), Thiollay (1985), Willis (1986).

4. White-tailed Ant-thrush

Neocossyphus poensis

French: Néocossyphe à queue blanche **Spanish**: Zorzal de Fernando Póo
German: Weißschwanz-Fuchsdrossel

Taxonomy. *Cossypha poensis* Strickland, 1844, Clarence, Bioko.
Genus closest to *Stizorhina*, the two forming a group which, in turn, is most closely related to New World *Myadestes*. Described races *pallidigularis* (from N Angola), *kakamegoes* (from Kakamega Forest, in Kenya) and *nigridorsalis* (N Nandi Forest, in W Kenya) all considered indistinguishable from *praepectoralis*. Two subspecies recognized.
Subspecies and Distribution.
N. p. poensis (Strickland, 1844) – Sierra Leone E to Cameroon, Gabon and S PRCongo, also Bioko I (Fernando Póo).
N. p. praepectoralis Jackson, 1906 – W DRCongo and NW Angola E to W Uganda and W Kenya.



Descriptive notes. 20–22 cm; 43–60 g. Nominate race is dark brownish slate above, with prominent white tips on outer three tail feathers; conspicuous broad orange-rufous wingbar (obvious in flight); throat paler and greyish, underparts rufous-orange; bill blackish; legs pale flesh. Distinguished from very similar *Stizorhina finschi* by darker upperparts, dark rump, more prominent wingbar, larger bill, longer legs; also by tail-pumping behaviour. Sexes similar. Juvenile undescribed. Race *praepectoralis* is browner above than nominate, has less white in tail. Voice. Song, sometimes from 10–15 m up in tree, rich and *Turdus*-like but subdued and rarely heard, "wurriiit t'rii uiiiiiit…"; often given around ant swarms. Calls include single shrill, second-long, ascending whistle, "huwiiiiit" or "tlooeeet" or "wiiiiiiiit", and descending sibilant "tsiiiiuw", usually frequently repeated; also sharp "sip-sip" in alarm, loud "hiiir-her-hih" in intraspecific chases, and commonly a ticking "prrt-prrt", which may be followed by single rising or falling downslur, at ant swarms and in flight.
Habitat. Mainly floor and lower understorey of primary lowland forest, especially marshy areas, also old secondary growth, forest edge, abandoned cacao plantations, large clearings with fallen trees, degraded river-island forest patches, occasionally forest patches in savanna. To 1400 m in Liberia, 50–1050 m in Cameroon, lowlands to 800 m on Bioko, to 750 m in Angola; sea-level to 1500 m in E DRCongo and Uganda, and 1700–1900 m (once 2500 m) in Kenya and Rwanda.
Food and Feeding. Mainly small insects and their larvae, such as ants (Hymenoptera), termites (Isoptera), beetles (Coleoptera), cockroaches (Blattodea) and grasshoppers (Orthoptera); also spiders, millipedes (Diplopoda) and other terrestrial arthropods; rarely, small frogs and berries. Forages on ground in leaf litter, or amid tangles of roots and twigs near ground; also sallies to vegetation. Almost always seen around army-ant swarms, on which it is heavily dependent; usually hops just ahead of swarm, often interacting aggressively with other ant-followers. Also joins mixed-species flocks.
Breeding. Little information; nest and eggs unknown. Birds in breeding condition in Apr–Jul and juveniles in Sept and Nov in Liberia; breeding-condition bird in Sept in Ghana; fledglings in Jul in Nigeria; breeding condition in Jul–Aug and young in Jul, Sept and Nov in Cameroon; breeding-condition bird in May on Bioko; breeding condition and young in Apr–Jun and Oct–Nov in DRCongo; breeding condition in Feb in Angola.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Common to locally common or uncommon. Commonest thrush in forests of SW Ghana. Frequent to common in Gabon, density 6–7 pairs/km² (but with fairly large home range, one bird moving 800 m). Uncommon to locally common in W & E Africa, although possibly overlooked; mist-netting on Bioko reveals that this species is far commoner than field observations suggest. Rare but regular in Kakamega Nature Reserve, in Kenya; widespread, but rarer than *N. rufus*, in Odzala and Nouabalé-Ndoki National Parks, in PRCongo.
Bibliography. van den Akker & Claffey (2003), Bannerman (1953), Borrow & Demey (2001), Britton (1980), Brosset & Érard (1986), Chapin (1953), Christy & Clarke (1994), Clement & Hathway (2000), Colston & Curry-Lindahl (1986), Cunningham-van Someren & Schifter (1981), Dean (2000), Demey & Fishpool (1994), Dowsett

On following page: 5. Boulder Chat (*Pinarornis plumosus*).

(1990), Dowsett & Dowsett-Lemaire (1997), Dutson & Branscombe (1990), Eisentraut (1973), Elgood *et al.* (1994), Gatter (1997), Grimes (1987), Keith *et al.* (1992), Lippens & Wille (1976), Pasquet *et al.* (1999), Pérez del Val (1996), Plumptre & Mutungire (1996), Prigogine (1971), Rodewald *et al.* (1994), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Stuart (1986), Thiollay (1985), Traylor (1962), Willis (1986), Zimmerman (1972), Zimmerman *et al.* (1996).

Genus *PINARORNIS* Sharpe, 1876

5. Boulder Chat

Pinarornis plumosus

French: Rochassier des éboulis **German**: Steinspringer **Spanish**: Zorzal Roquero

Taxonomy. *Pinarornis plumosus* Sharpe, 1876, Victoria Falls; error = Matobo Hills, Matabeleland, Zimbabwe.
Monotypic.
Distribution. Locally E Zambia, W Malawi, Zimbabwe, E Botswana, and W & C Mozambique (Tete district).
Descriptive notes. 23–27 cm; 66 g. Plumage is dark brownish-grey above, becoming blackish below, chin and throat finely tipped whitish, crissum faintly scaled whitish; white tips of tail feathers except central two pairs, white patch in primaries (visible mainly in flight); bill and legs black. Sexes similar. Juvenile has slight pale barring on upper body and spotting on breast. VOICE. Song a medley of high, thin, sweet notes, reminiscent of that of *Erithacus rubecula*. Call or second song distinctive, a high "twiiwiip tiiiip tiiwiiiiiiit" or "tsuui tsu tsu p'loo", like 3–4 turns of squeaky wheel, each note 0·5 seconds long and followed by 0·5-second pause, sequence repeated almost without break for minutes on end; often given near nest.



Habitat. Restricted to outcropping granitic hills with some tree canopy; occurs on lower slopes with large boulders and plenty of scattered trees, also in steep rocky dry streambeds. Outcrops may be less than 0·5 ha in size and surrounded by forest or savanna, usually miombo, but also mopane (*Colophospermum*) in E Botswana. Found mainly among boulders under wooded canopy; avoids large open rocky areas or densely vegetated areas.
Food and Feeding. Insects and small lizards, which are gleaned from leaves and bark; also hawks flying termites (Isoptera) using aerial sallies.
Breeding. Nov in Malawi, Dec in Zambia and Jan in Botswana; Sept–Jan (peak Oct–Nov) in Zimbabwe. Nest a sparse, neat unlined cup of loose leaves and vegetable debris with bits of bark, earth and twigs, set into leaf litter on ground under boulder or log or in cleft in rock; either well hidden or fairly conspicuous. Eggs 2–4, mostly 3, mean of 13 clutches 2·8, greenish-white with reddish-brown speckling; incubation period 15 days; nestling period 16–20 days; period of post-fledging dependence unknown, but family parties persists until following breeding season. Many nests parasitized by Red-chested Cuckoo (*Cuculus solitarius*), e.g. 8·47% of 118 S African nests; possibly also by Black Cuckoo (*C. clamosus*), but this is disputed.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Generally frequent to common within its restricted but essentially secure habitat; breeding density of 1·2 pairs/km² recorded in Matobo Hills, in Zimbabwe. Appears to have deserted some former koppie habitat in Zimbabwe when vegetation grew too dense with spread of alien *Lantana*; at least one site in Botswana abandoned when trees were felled.
Bibliography. Benson *et al.* (1971), Brooke (1965), Chapman (1978), Davidson (1996), Day (1987), Ginn *et al.* (1989), Grobler & Steyn (1980), Harrison *et al.* (1997), Irwin (1953, 1957a, 1981), Irwin & Benson (1966), Keith *et al.* (1992), Kuiper & Cherry (2002), Maclean (1993), Medland (1985), Payne & Payne (1967), Penry (1994), Rowan (1983), Sherry (1985), Skinner (1995), Tarboton (2001).

PLATE 50 ➤



PLATE 50

inches 3

cm 8

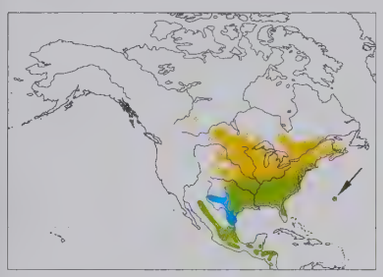
Genus *SIALIA* Swainson, 1827

6. Eastern Bluebird

Sialia sialis

French: Merlebleu de l'Est **German**: Rotkehl-Hüttensänger **Spanish**: Azulejo Oriental
Other common names: Azure Bluebird

Taxonomy. *Motacilla Sialis* Linnaeus, 1758, South Carolina, USA.
Occasionally hybridizes with *S. currucoides*. Geographical variation slight, and level of individual variation in morphology and behaviour within and between populations remarkably high; in addition, lack of a "prealternate" moult results in very worn birds in spring and summer, confounding racial analysis and attribution; *bermudensis*, *grata* and *meridionalis* possibly untenable. Proposed race *episcopus* (S coastal Texas, in USA, S to S Tamaulipas, in NE Mexico) considered indistinguishable from nominate. Eight subspecies recognized.
Subspecies and Distribution.
S. s. sialis (Linnaeus, 1758) – S & SE Canada and E USA S to NE Mexico; non-breeding also N Mexico and Bermuda.
S. s. fulva Brewster, 1885 – SW USA (SE Arizona) S through montane C Mexico.
S. s. grata Bangs, 1898 – SW USA (S Florida).
S. s. bermudensis Verrill, 1901 – Bermuda.
S. s. nidificans A. R. Phillips, 1991 – Caribbean slope of EC Mexico.
S. s. guatemalae Ridgway, 1882 – SE Mexico (Chiapas) and Guatemala.
S. s. meridionalis Dickey & van Rossem, 1930 – El Salvador, Honduras and N Nicaragua.
S. s. caribaea T. R. Howell, 1965 – E Honduras and NE Nicaragua.



Descriptive notes. 16·5–21 cm; 26–32 g. Male nominate race is rich blue above and on side of head, with blackish tips of tail; submoustachial area and neck to flanks chestnut-orange, belly to vent white; plumage much duller when worn; bill and legs black. Female is paler and duller, grey largely replacing blue on head and upperparts, except paler blue outer primaries, rump and tail, pale orange replacing chestnut-orange below, mainly white on chin and throat; some females almost as bright as male below, but always with mainly grey upperparts. Juvenile is brown with buff speckling above, but always some trace of blue on wings and tail, greyish-white with dark mottling below. Race *grata* is slightly longer-billed than nominate; *nidificans* is slightly larger than nominate and richer below; *fulva* is large and rather pale, male often with cinnamon fringes on scapulars when plumage fresh; *guatemalae* resembles previous, but male possibly redder below, female paler below; *meridionalis* is slightly smaller than last, male more reddish below, female bluer above; *caribaea* is smallest; *bermudensis* is reputedly brighter blue above, darker red below. VOICE. Song, usually by male, from high exposed perch or in flight, at rate of 15–20 per minute, a rich, low-pitched and often rapid warbling, "ayo ala loee, alee ay lalo leeo" or "chiti wiiu wewidoo"; also performed as whisper (or soft) song, perhaps simply for contact with female, e.g. when laying. "Alarm song", by both sexes in presence of predator, same as song but preceded by one or more click notes. Calls include loud, low "tu-a-wee" or "jeew wiwi" as contact; loud nasal rasp in alarm, harsh "pridik"; squawk when chased; low soft "chip" or "peep" by female in courtship; series of high "turr" notes in aggression; loud chattering "chit-chit-chit" in mild alarm at ground predator; harsh alarm scream or screech when very closely approached; and soft warbling chatter in intraspecific aggression; also loud bill-snaps when mobbing potential predator.
Habitat. Originally probably fire-maintained savannas, open stands of mature pinewood, dead trees overhanging water, xeric forest openings on hill summits and spurs, and E boreal forest. Modern breeding habitats include orchards, clear-cuts in oak–hickory (*Quercus–Carya*) forest, burnt jack pine (*Pinus banksiana*) tracts, pine (*P. palustris–P. caribaea*) woodland, and swampy ground near urban areas; winter habitat open forest, forest edge, pastures, orchards and parklands. Key requirements are open wooded habitat with sparse ground cover and nest-hole availability; thus, use of open-canopy areas, including grass verges of railroad tracks, increases with erection of nestboxes. Where sympatric with *S. mexicana* and *S. currucoides* in S USA (Texas), confined to stands of oak (*Q. agrifolis*) and adjacent pines. Sea-level to 2440 m in USA. In Mexico, arid to semi-humid oak and pine–oak woodland, open areas with scattered trees and bushes, at 600–2700 m; wintering birds, NE Mexico, from sea-level to 1500 m. Pine and pine-oak associations, mainly 600–1800 m, in Honduras.
Food and Feeding. Chiefly terrestrial arthropods in spring and summer, greatly supplemented and often largely replaced by fruits during autumn and winter. Three all-year studies; in Michigan (USA), caterpillars formed 32% of animal component, beetles (Coleoptera) 31%, grasshoppers and crickets (Orthoptera) 26% and spiders 11%, supplemented by mistletoe (*Phoradendron californicum*) and sumacs (*Rhus*); in Illinois (USA), insects 78%, spiders 8%, other invertebrates 1% and fruits 13%; in Canada, invertebrates formed 68% (over half of which were grasshoppers and crickets) and fruits 32%. Foods fed to nestlings include relatively fewer chitinous insects; in one Michigan study, caterpillars 35–41%, spiders 6–31%, grasshoppers 7–17%, crickets 7–10%, adult moths 3–7%, earthworms 1–8%, ants (Hymenoptera) 1–7%, beetles 1–5%, bush-crickets (Tettigoniidae) 0·5–3%, together with fruits of mulberry (*Morus*), raspberry (*Rubus*), dogwood (*Cornus*), cherry (*Prunus*) and honeysuckle (*Lonicera*); in another study, in Tennessee, 25% caterpillars, 22% grasshoppers, 16% spiders, 15% crickets, 2% moths, remainder unidentifiable or too infrequently fed to be listed. As many as 60 species of fruit found in stomachs collected Oct–Feb, and 75% of all reported fruit items are from winter period; genera of fruit taken include *Nyssa*, *Vaccinium*, *Cinnamomum*, *Prunus*, *Ribes*, *Ilex*, *Cornus*, *Elaeagnus*, *Celtis*, *Lonicera*, *Persea*, *Phytolacca*, *Pyracantha*, *Bitis*, *Juniperus* and *Cocculus*. Rarely, small vertebrates taken, including shrews (Soricidae), snakes, salamanders, lizards and tree-frogs; ground skinks (*Scincella lateralis*), and once a flat-headed snake (*Tantilla gracilis*) 8·3 cm long, delivered to nestlings in Oklahoma. Tends to take rather large prey items, e.g. 56% of items in one study were larger than length of bill (but these constituted only 21% of available prey). In spring, almost exclusive foraging method is sally-pounce on terrestrial prey from exposed perch 15–20 m (sometimes up to 40 m) away; this method always commonest through year, but also uses flycatching sallies, gleaning and terrestrial searching from summer to winter. Sometimes, in open country, hovers before pouncing on prey. Defends feeding areas during winter, even when in flocks of 2–30; but also often forms persistent associations with Pine Warblers (*Dendroica pinus*) and, less predictably, with *Turdus migratorius*.
Breeding. Feb–Sept, mainly Mar–Aug, latitude-dependent, but Apr peak month for laying in all areas; mostly double-brooded, but in boreal Canada and in SW USA (Florida) mostly single-brooded, while in C part of range often triple-brooded (and records of five broods in one season). Generally monogamous, but polygyny and polyandry occur; divorce common, particularly when first brood fails (in Michigan, 30–50% of unsuccessful pairs renest together in same season, as against 70–85% of successful pairs), breeding failure also being associated with change of breeding grounds (in one study, 56% of successful individuals returned to previous year's breeding area, as against 15% of unsuccessful ones). Semi-colonial nester when opportunities arise, and tends to select nest-sites closer to, rather than farther from, neighbouring nest-site. Average territory size 2·1 ha in one study, range 1·1–8·4 ha in another, size varying with habitat, territories in burnt or cut-over areas smaller than those in old fields, pastures or orchards, probably because of increased ease of foraging and number of perches; territory size decreases as breeding season progresses. Nest a loose cup of grass and/or pine needles, usually lined with fine grass, occasionally with horsehair or feathers, placed in cavity in tree, preferentially dead; in one study 71·5% of nests were in pine or oak and 77·6% in abandoned woodpecker (Picidae) holes; takes readily to nestboxes, preferring those mounted on wooden (rather than steel) posts. Eggs 3–7, modal clutch size in South Carolina (USA) 5 in spring and 4 in summer, eggs plain pale blue, rarely white; incubation period 13–14 days (range 11–19), in South Carolina 14 days in spring, 13 days in summer; nestling period 18–19 days, again marginally shorter in summer broods than in spring ones; very rarely, juvenile, presumably of earlier brood, may help in provisioning later brood, and a few cases of adult helper (usually yearling son of current breeders); post-fledging dependence up to 3 weeks; first-brood young often flock with other juveniles and roam the various territories together in middle to late summer, otherwise young (mainly those from second broods) stay with parents and later join with other family parties in small flocks. Brood parasitism by cowbirds (*Molothrus*) low. Some 83% of eggs hatch and 75–80% of hatchlings fledge, overall nest success 55–84%; Northern House Wrens (*Troglodytes aedon*), House Sparrows (*Passer domesticus*), cats (*Felis domesticus*) and raccoons (*Procyon lotor*) are major causes of nest failure, and total failure significantly lower in open-top nestboxes than in aperture boxes (probably because wrens and sparrows prefer aperture-access cavities); yearling breeders generally slightly less productive (4·3 young per pair per season) than older ones (5·7). Adult survivorship 47%. Oldest recorded wild individual 8 years.
Movements. Partial migrant, commonly travelling in small groups, sometimes in flocks of several hundreds; juveniles often segregated in own parties throughout non-breeding period, and tend to travel farther from breeding areas than adults. Proportion of migrants to year-round residents determined by severity of weather, and some N migrants evidently "leap-frog" over resident populations to winter farther S. Diurnal migrant. Timing of spring migration difficult to gauge owing to presence of residents within range of migrants, but generally or mainly late Feb to early Apr in Missouri, mid-Mar to early Apr in Ohio, early Mar to mid-May in Minnesota, late Feb or Mar in Massachusetts, mid-Mar to early Apr in S Quebec; autumn migration mainly Oct–Nov Massachusetts, late Sept to early Oct Minnesota, Oct Ohio, mid-Oct to mid-Nov Missouri, mid-Sept to Nov Arkansas, arriving late Oct and Nov Florida (doubling the resident population). In Middle America, residents move lower in winter, and loose wandering flocks form in the arid pine–oak formations in Colima; irregular winter visitor to NE Mexico. Rare vagrant to Cuba.
Status and Conservation. Not globally threatened. Common in much of range; fairly common to common in Mexico; fairly common in Honduras. Constraints on numbers variable, but include weather and the availability of nest-sites and of food in both winter and summer. Historically, species expanded its range into grasslands of Great Plains during early 20th century, probably because of anthropogenic increases in tree cover; in areas farther E, replacement of pinewoods and deciduous forest with farmland and orchards in 19th century created much new habitat. Currently judged to be stable or increasing, following a period of decline in decades to 1980 probably attributable to unfavourable weather conditions in successive winters and springs. Since 1980, milder winters and a nestbox campaign across North America have contributed to increase in numbers (53% during 1984–1993). Range now expanding in NW in response to increases in fenced grazing lands (providing foraging perches) and, latterly, provision of nestboxes; in Canada, reached Manitoba in late 1800s, Saskatchewan by 1920s, SE Alberta in 1970s. In S USA, expanded into Chiricahua Mts (Arizona) in 1960s, but range contracted N in Florida since 1960. In Bermuda, numbers formerly very high owing to absence of mammalian predators and abundance of natural cavities in native cedar (*Juniperus bermudianus*), but fell with introducion of House Sparrow in 19th century, and again after introduction of Common Starling (*Sturnus vulgaris*) and Great Kiskadee (*Pitangus sulphuratus*) in 1950s, and probably with spread of domestic cats and declining numbers of cedars.

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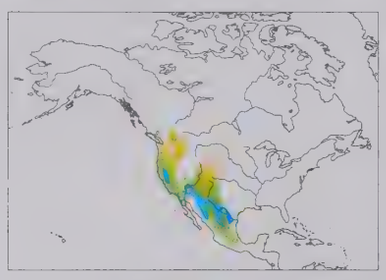
On following pages: 7. Western Bluebird (*Sialia mexicana*); 8. Mountain Bluebird (*Sialia currucoides*); 9. Kamao (*Myadestes myadestinus*); 10. Olomao (*Myadestes lanaiensis*); 11. Omao (*Myadestes obscurus*); 12. Puaiohi (*Myadestes palmeri*); 13. Townsend's Solitaire (*Myadestes townsendi*); 14. Brown-backed Solitaire (*Myadestes occidentalis*); 15. Cuban Solitaire (*Myadestes elisabeth*); 16. Rufous-throated Solitaire (*Myadestes genibarbis*); 17. Slate-coloured Solitaire (*Myadestes unicolor*); 18. Black-faced Solitaire (*Myadestes melanops*); 19. Varied Solitaire (*Myadestes coloratus*); 20. Andean Solitaire (*Myadestes ralloides*).

7. Western Bluebird

Sialia mexicana

French: Merlebleu de l'Ouest **German**: Blaukehl-Hüttensänger **Spanish**: Azulejo Occidental

Taxonomy. *Sialia Mexicana* Swainson, 1832, tableland of Mexico.
Geographical variation relatively slight, but individual variation rather wide; some accepted races possibly untenable. Proposed Mexican races *anabelae* (N Baja California) and *australis* (S plateau) considered indistinguishable from, respectively, *occidentalis* and nominate. Six subspecies recognized.
Subspecies and Distribution.
S. m. occidentalis J. K. Townsend, 1837 – SW Canada S to NW Mexico (N Baja California).
S. m. bairdi Ridgway, 1894 – interior W USA S to NW Mexico (S Sonora and NW Chihuahua).
S. m. jacoti A. R. Phillips, 1991 – S USA (Davis Mts, in S Texas) and NE Mexico (San Luis Mts).
S. m. amabilis R. T. Moore, 1939 – NW Mexico (SE Chihuahua to NW Zacatecas).
S. m. nelsoni A. R. Phillips, 1991 – NE & C Mexico (N Coahuila to W San Luis Potosí, N Guanajuato and NE Jalisco).
S. m. mexicana Swainson, 1832 – C Mexico (Veracruz to N Puebla and Hidalgo, W to Michoacán and Aguascalientes).



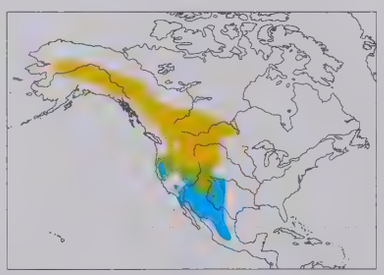
Descriptive notes. 16·5–19·cm; 24–31 g. Male nominate race has entire head to uppermost breast, and upperparts, rich blue, patch on scapulars rusty-red, blackish tips of tail; breast to flanks and upper belly chestnut-orange, mid-belly and vent blue or blue-tinged; plumage much duller when worn; bill and legs black. Female is much paler and duller, greyish on head and back, pale blue on outer primaries, rump and tail, with buffy-rufous wash on breast and upper flanks, greyish-white belly; sometimes brighter, with blue-tinged head, orangey breast and flanks, and darker blue on wings and tail. Juvenile is brown with buff speckles above, trace of blue on wings and tail, greyish-white with dark mottling below. Race *nelsoni* is small and somewhat variable, with more extensive blue than any other race, little or no rust-red above, breast and flanks variably cinnamon-rufous; *amabilis* is darker blue with extensive rust-red on back; *jacoti* is relatively dark and dull, dorsally less rufous; *bairdi* male has extensive rust-red on back, including lower scapulars; *occidentalis* is slightly smaller than last, blue relatively pale. Voice. Two songs distinguished, but appear to intergrade. Dawn/pre-dawn song includes common "few" call interspersed with aggressive rattling calls, creating vigorous loud twangy carolling, "f-few, few, f-few, eh-eh, few, f-few, eh-eh, few, eh-eh, few, few...", changing as season progresses to "ic-ic te, tew, ic-ic tew, ic-ic towee..." and musical "too-lee"; daytime song simple mixture of various calls, e.g. "pa-wee few few, few few fa-wee...", with "echechik-to" occasionally inserted, or (California) "kew kew kew kew kew kew kew che-chek". Calls include nasal twangy "few", "jewf" or "choy", sometimes doubled, frequently given in flight; soft dry rattling "eh-eh" or "che-chek" or "cut-cut-cut" chatter in aggression, becoming softer "tch-tch-tch" by intruding male; "pa-wee" during territorial establishment and pairing; squawks and screeches in intraspecific chases and when captured. Bill-snaps in alarm or aggression.
Habitat. Hilly and montane regions with open park-like coniferous and deciduous forest, ragged forest margins, burnt woodland patches, riparian growth, part-wooded farmland and grassland, orchards, secondary areas; high numbers concentrated in montane "transition zone" (at 1520–2900 m) typified by ponderosa pine (*Pinus ponderosa*) forest, a favoured habitat; breeds also in piñon–juniper (*Pinus–Juniperus*) and pine–fir–aspen (*Pinus–Abies–Populus*) woodlands in Utah, and in Oregon common in forests of Douglas fir (*Pseudotsuga menziesii*) and pine, less so in juniper woodland. In ponderosa and pine–oak (*Pinus–Quercus*) forest, abundance inversely related to canopy cover: greatest density where canopy cover less than 20%. In Mexico, breeds in arid to semi-humid pine woodland with grassy clearings, and open areas with scattered bushes and trees, at 1500–3000 m. Prefers open canopy, hence abundant in partly disturbed areas, including logged forest; in N Arizona, breeding densities greatest in moderately thinned study plot of ponderosa pine. In non-breeding season, found in foothills and plains down to sea-level, occupying piñon–juniper, mesquite (*Prosopis*), oak and riparian woodland, coastal chaparral, and even desert areas. Recorded as foraging in intertidal and upper beach zones in coastal British Columbia.
Food and Feeding. Mainly arthropods in spring and summer; mainly small fruits and some seeds in autumn and winter. Major animal items include grasshoppers (Orthoptera), caterpillars, beetles (Coleoptera), bugs (Hemiptera), ants, wasps and bees (Hymenoptera), spiders, millipedes (Diplopoda), angleworms (Oligochaeta), snails, sow bugs (Isopoda), termites (Isoptera) and scale insects (Coccidae). Soft-bodied invertebrates fed to young; whereas pre-nesting and nesting adults ate 37–68% beetles, 10–29% ants, 5–16% bugs and very few spiders, nestlings were fed with 54% grasshoppers, 29% beetles, 8% spiders, very few ants and no bugs. Major vegetable food items include fruits of *Amelanchier*, *Ficus*, *Juniperus*, *Phoenix*, *Phoradendron* mistletoe, *Polygonum*, *Prunus*, *Rhamnus*, *Rhus*, *Ribes*, *Rubus*, *Rumex*, *Sambucus*, *Schinus*, *Solanum* and *Vitus*. Mistletoe berries commonly consumed throughout range; size of local winter population in California and Arizona possibly determined partly by abundance of mistletoe berries, a major component of winter diet there. In breeding season, primarily still-hunts from low perch, e.g. branch, bush, stump, stalk, roof, post or fence, dropping to ground to take prey, but also sallies in air, gleans from leaves, branches and trunks, hover-dives, and forages on ground; proportion of each technique varies, apparently according to habitat and temporal availability of prey. In winter, forages from branches, picking off small fruits, or on ground for fallen items; also continues to still-hunt and flycatch for invertebrates. When not breeding, often forms loose foraging flocks with other species, including *S. currucoides*, *Turdus migratorius* and Yellow-rumped Warblers (*Dendroica coronata*).
Breeding. Mid-Apr to early Aug; normally 1–2 broods per year, depending on local conditions, but up to three in Oregon. Monogamous, pair-bond generally maintained over at least several years; extra-pair copulations extensive, however, with 19% of nestlings in California the product of such liaisons and 45% of broods containing at least one offspring of second male. Some co-operative breeding: in one study in California, 7·4% of pairs had helpers, all adults among which were male (mostly yearlings, but age 1–4 years), some with failed nests in same year, some helping at own nest simultaneously, and among juvenile (same year) helpers 86% were male and 90% helped presumed own parents; in Oregon, 10·5% of nests with chicks had helpers, 69% of which were juvenile and 31% adult, with 94% of adult helpers male and 54% of juvenile ones male. Territory size in one Arizona study 0·43 ha (range 0·29–0·61 ha), elsewhere in state 0·56–0·79 ha; variable according to year and habitat type. Nest a neatly woven cup of grasses, fibres, pine needles, moss, fur and bark, usually lined with finer grasses, feathers, rootlets and/or horsehair, placed in rotted or excavated hole in living or dead tree or dead limb, or between trunk and bark, commonly used trees pine, oak, willow (*Salix*), aspen and cottonwood (*Populus*), and sycamore (*Platanus*); sometimes also in hole in wall or other man-made structure, or mud nest of swallow (Hirundinidae), commonly in nestbox; nest height in oak woodland generally 4–5 m, in snags 6·6 m, and in aspen groves 14·5 m. Eggs 2–6, typically 5, plain pale blue, occasionally white; incubation usually 13–14 days (range 12–18 days); nestling period usually 22 days (range 16–23 days); post-fledging dependence c. 2 weeks. Brood parasitism by cowbird (*Molothrus*) rare. In various studies (most based on populations using nestboxes, which tend to reduce predation rates), mean yearly hatching success 72–89%, fledging success 65–88%, nest success (percent of nests with eggs from which at least one young fledges) 71–89% (in these ranges, upper value represents study which sampled only first broods); nests with adult helpers fledged 12% more young than did nests without helpers, and those with juvenile helpers contained significantly fewer chicks than did nests without helpers; nest predation by chipmunks (*Eutamias*), squirrels (*Tamiasciurus*) and other rodents evidently common, also by weasels (*Mustela*), snakes, cats and raccoons (*Procyon lotor*). Oldest recorded individual 6 years.
Movements. Partial and/or altitudinal migrant; winters usually in small flocks, often family parties, sometimes amalgamating into loose bands of 20 individuals, mainly within breeding range and typically at lower elevations. Mainly diurnal migrant. Movements largely facultative; in mild winters may remain on breeding grounds. Elevational distances often so short that, on mild days, individuals move back up to breeding grounds, before descending again as poor weather returns. Delineation of migration seasons therefore vague: spring passage mainly mid-Feb to mid-Apr, autumn passage mid-Aug to early Nov. Mainly migratory in extreme N part of range in Canada (British Columbia), but some there are resident. In Mexico, some individuals appear in lower-lying areas (down to sea-level in NW) in Nov–Apr; unclear if these are local altitudinal migrants (which is probable) or immigrants from N.
Status and Conservation. Not globally threatened. Widespread and relatively numerous; fairly common to common in Mexico. Densities vary with habitat, but in optimal conditions (e.g. ponderosa pine forest and burnt areas with 8 trees/ha) as many as 0·5 pairs/ha. Population trends, however, generally negative, and concern expressed for viability of remaining populations in various US states (Oregon, Utah, Washington, New Mexico, California) and in British Columbia. Declines registered on W side of Cascade Range (Pacific Northwest) in 1950–1980, and significant decline in California in 1980–1994. Review of literature suggested that declines of just under 50% in Nevada and Arizona were attributable to introduced Common Starling (*Sturnus vulgaris*) and overgrazing; apart from these factors, however, declines caused by habitat degradation (loss of suitable nest-sites and foraging areas) through extensive clear-cutting and snag removal, suppression of natural fires, and industrial and urban development; also, increased wet weather in Washington state reduced prey abundance. Short-term measure of great importance has been provision of nestboxes in otherwise suitable habitats: local breeding populations in Arizona increased three-fold to four-fold with deployment of boxes in moderately to heavily logged areas, and similar results (albeit with slower take-up) at one site in Oregon, where five out of 130 boxes used in 1977 but 108 of 200 in 1996. Longer-term measure of habitat restoration enhanced breeding success; in treated forest stands number of fledglings per nest on average 1·6 times greater, and probability of a nest producing at least one young up to 4·2 times greater, than in untreated forest. Nevertheless, recent Oregon study of demographic pattern ambiguous, with seemingly slow overall population increase but also evidence of declines.
Bibliography. Anon. (1998b), Aylesworth (1987), Beal (1915), Bent (1949), Bildfell *et al.* (2001), Brawn (1984, 1991), DeGraaf & Rappole (1995), DeSante & George (1994), Dickinson, J.L. (1997, 2003, 2004), Dickinson, J.L. & Akre (1998), Dickinson, J.L. & Leonard (1996), Dickinson, J.L. & Weathers (1999), Dickinson, J.L., Koenig & Pitelka (1996), Dickinson, J.L., Kraaijeveld & Smit-Kraaijelveld (2000), Dunn (1981), Eltzroth (1983, 1987), Eltzroth *et al.* (1980), Fair & Myers (2002), Fair *et al.* (2003), Friedmann *et al.* (1957), Germaine & Germaine (2002), Godfrey (1986), Guinan *et al.* (2000), Herlugson (1980, 1982, 1983a), Howell & Webb (1995), Keyser *et al.* (2004), Koenig & Dickinson (1996), Leonard, Dickinson *et al.* (1995), Leonard, Teather *et al.* (1994), Mock (1991), Monk (1997), Myers (1912), Pinkowski (1979e, 1981), Pollock (1986), Root (1988), Rosenstock (1996), Russell & Monson (1998), Sibley (2000), Sims (1983), Stokes & Stokes (1991), Szaro (1976), Weitzel (2003), Weydemeyer (1934b), With & Balda (1990), Zeleny (1976).

8. Mountain Bluebird

Sialia currucoides

French: Merlebleu azuré **German**: Berghüttensänger **Spanish**: Azulejo Claro
Other common names: Arctic Bluebird

Taxonomy. *Motacilla s. Sylvia Currucoides* Bechstein, 1798, "Virginien" = western North America. Has been suggested that specific name *currucoides* inapplicable, and that name *arctica* is required. Occasionally hybridizes with *S. sialis*. Monotypic.
Distribution. C & E Alaska, W & C Canada and W USA; non-breeding S to SW & SC USA and W & C Mexico.



Descriptive notes. 16·5–20 cm; 27–33 g. Male is slightly glossy bright cobalt-blue above, vaguely darker on ear-coverts and lores; tips of flight-feathers and of tail blackish; azure-blue below, slight turquoise tinge on chin and throat, and shading to white on belly and vent; bill and legs blackish. Female is dull warm buff-brownish above with tinges of blue on wings, slightly green-tinged blue on rump and tail, paler buff-brown below, with whitish eyering, sometimes vague dark malar line; some have rufous tinge on breast. Juvenile is like female, but slightly darker and duller above, with white scaly spotting across buff-brown areas below. Voice. Song, from several perches within territory, often near nest-cavity and sometimes in flight, of two types: dawn song (before first light, infrequent, but often in flight) a loud emphatic "chow, chow, poly-chow, poly-chow" or "jerrf jerrf jewr jipo jerrf", lasting 4–7 seconds, reminiscent of song of *Turdus migratorius*; day song (common at all times) a soft short warble, "eee-ee-e", often repeated for minutes on end. Calls include nasal "peu", "perf" or "feeer" as contact, high "tink" alarm, and short harsh "chik" or "chak"; snaps bill when diving at intruders.
Habitat. Breeds in tree-line–tundra ecotones, prairie–forest ecotones, savannas, grassland with groves of trees and sparse shrubs, recently burnt land, clear-cuts, sagebrush flats and valleys; to 3800 m. Winters in flat grassland with scattered trees and bushes, meadows with hedges and trees, lowland farmland, piñon–juniper (*Pinus–Juniperus*) forest, open oak (*Quercus*) forest, oak–juniper woodland and creosote bush (*Larrea*) country. In Mexico in non-breeding season, small flocks

occupy open country, especially grassland, with scattered bushes and trees, at 1000–2500 m, but down to sea-level in NW.
Food and Feeding. Mainly arthropods in spring and summer; mainly small fruits and some seeds in autumn and winter. Invertebrate food in one all-year study consisted of 30% beetles (Coleoptera), 23% grasshoppers (Orthoptera), 14% caterpillars, 17% hymenopterans (13% ants, 4% bees and wasps) and 4% bugs (Hemiptera); vegetable food was *Cedrus*, *Celtis*, *Parthenocissus*, *Rhus*, *Ribes*, *Sambucus*, *Vitis*. Animal food in 194 stomachs fromUtah, Apr–Oct, was 34% beetles, 30% ants, wasps and bees, 9% grasshoppers, 8% butterflies and moths (presumably mainly caterpillars), 5% bugs, and 3% flies (Diptera). Breeding-season animal food consumed by adults in Washington was 57% beetles and 37% grasshoppers, with spiders figuring strongly in pre-nestling period. Food given to nestlings in Montana included 33% grasshoppers, 27% caterpillars (greatly preferred, but decreasingly available over time), and undisclosed quantity of spiders; in Washington, 58% grasshoppers, 23% bugs, 10% beetles, 5% spiders, 4% butterflies and moths (presumably mainly caterpillars), adults feeding larger items to offspring than they consumed themselves. Forages from trees, utility lines, fences, rocks, bare ground; prefers perches at or below 6 m, and prefers to hunt in short herb layer or on bare ground. Methods include still-hunting (perch-foraging, ground-sallying), hover-foraging, ground-foraging, aerial sallying (flycatching) and hawking (deviating from flightpath to pursue insect). Settles on ground and hovers more than do congeners.
Breeding. Apr to early Sept, mean date for first-clutch completion mid-May in C of range; two broods attempted by c. 50% of pairs; nest failure may result in up to three breeding attempts in a year. Territory relatively large, generally more than 5 ha, at least at start of breeding cycle, owing to often wide dispersal of foraging posts (and probably need to encompass more than one option for nest-site), but diminishes to area around nest as nest duties (and probably mate-guarding) require increased presence near nest-site. Nest a cup of coarse dry grass, lined with fine stems and soft bark, sometimes wool or feathers, placed in hole in tree, building or cliff; many, perhaps most, pairs now use nestboxes. Eggs 4–8, usually 5–6, plain pale blue to bluish-white; incubation period 13 days; nestling period 18–21 days, usually c. 20 days; post-fledging dependence 3–4 weeks, sometimes even 2 months. Brood-parasitism by cowbirds (*Molothrus*) very rare.
Movements. Most migratory of genus, but majority of population winters at lower elevations within breeding range; penetration S in any given year dependent on severity of winter, but winter distribution also influenced by availability of fruit. Present in Mexico Nov–Mar. Spring migration starts mid-Mar in S, with arrival on breeding grounds mainly Apr, even in Alaska, but dates variable with weather; Feb–Jun in Colorado highlands; males often precede females by several days or weeks. Autumn migration from Aug, but chiefly Sept–Oct, lasting into Nov. Post-breeding flocks of up to 30 (rarely, 200) individuals, usually fewer, with core of one or more pairs and fledged young, with addition of other families and individual adults (presumably failed breeders); in due course these presumably undertake migration together. In winter, often in loose flocks of up to 50 individuals, still made up of family parties, but often also associating with *S. mexicana*, New World sparrows (Emberizidae) and juncos (*Junco*).
Status and Conservation. Not globally threatened. Low but stable numbers across most of extensive range; irregularly common to fairly common in winter in Mexico. W spread of logging and grazing across North America in late 19th and early 20th centuries resulted in production of much new habitat for the species, which extended its breeding range E into Great Plains grasslands around 1900; but subsequent decline of these economic activities led to reduction in habitat. Intense competition with *S. sialis* and *S. mexicana* for nest-sites in various parts of range, indicating that cavity availability probably a significant constraint on population.
Bibliography. Anon. (1998b), Beal (1915), Bent (1949), Criddle (1927), DeGraaf & Rappole (1995), Den (1985), Dunn (1981), Erskine (1964), Friedmann *et al.* (1957), García *et al.* (1993), Godfrey (1986), Hébert (1994, 1999), Henny *et al.* (1977), Herlugson (1978, 1981, 1982, 1983b), Houston (1982), Howell & Webb (1995), Kermott *et al.* (1974), Knowlton & Harmston (1946), Lane, J. (1969, 1971), Lane, R.K. & Pearman (2003), Lumley (1934), Merkle & Barclay (1996), Miller (1970), Munro & Rounds (1985), Munro *et al.* (1981), Phillips (1991), Pinel (1980), Pinkowski (1976c, 1979e), Power (1966, 1975, 1979, 1980a, 1980b, 1980c), Power & Doner (1980), Power & Lombardo (1996), Root (1988), Rounds & Munro (1982, 1983), Russell & Monson (1998), Scott & Lane (1974), Sibley (2000), Steblay (1986), Swenson (1968), Weydemeyer (1934a, 1936), Zeleny (1976).

Genus *MYADESTES* Swainson, 1838

9. Kamao

Myadestes myadestinus

French: Solitaire kamao **German**: Kauaiklarino **Spanish**: Solitario Kamao
Other common names: Large Kauai Thrush

Taxonomy. *Phaeornis myadestina* Stejneger, 1887, Kauai Island, Hawaiian Islands.
Formerly placed with *M. lanaiensis*, *M. obscurus* and *M. palmeri* in a separate genus, *Phaeornis*. All previously regarded as conspecific, but differ vocally. Monotypic.
Distribution. Kauai, in Hawaiian Is.



Descriptive notes. 18–20 cm. Plain and short-legged thrush with short, broad bill. Plumage is plain brown above, with white-stippled brown lores and ear-coverts; white below, with vague greyish-white malar extending to grey-mottled breast; bill blackish; legs black. Sexes similar. Juvenile is lightly spotted whitish-buff above and on wing-coverts, scalloped grey-brown below. Voice. Song, from exposed perch in early morning, and sometimes in display-flight, a long complex fluty melody including liquid warbles, buzzy trills and gurgling whistles; similar to that of *M. obscurus*, but latter unresponsive to playback of song. Calls include cat- or frog-like raspy "braack", and higher-pitched note resembling sound of old-fashioned police whistle.
Habitat. Originally forest at all elevations. Since 1928 exclusively in dense montane forest, both mesic *Acacia–Metrosideros* forest and wet ohia forest (*Metrosideros–Syzygium–Cheirodendron*), with deeply dissected terrain and steep-walled ravines, at 1050–1300 m.
Food and Feeding. Primarily fruit, to lesser extent insects and land snails. Diet thought to be similar to that of *M. palmeri* and *M. obscurus*, but historical observations and larger bill suggest that it takes proportionately more fruit than does former.
Breeding. No information.
Movements. Presumably sedentary.
Status and Conservation. CRITICAL. Possibly Extinct. Restricted-range species: present in Central Hawaiian Islands EBA. Formerly (1891) the commonest forest bird on Kauai, but had disappeared from lower elevations by 1928. In 1968–1973, confined to Alakai Wilderness Preserve, with estimated population of 337 (± 122) individuals; in 1981 this had dropped to 24 (± 20), and by 1993 probably fewer than five individuals, while none was seen in intensive searches in 1995 and 1997. Disease vectored by introduced mosquitoes (Culicidae), compounded to some degree by destruction and degradation of indigenous forest and spread into upland areas of feral pigs (which create wallows in which mosquitoes can breed), judged to have caused precipitous decline of this species. Competition with introduced frugivorous birds may also be relevant, and impacts of major hurricanes in 1982 and 1992 likely to have contributed. Nest predation by introduced rats (*Rattus*) a further possibility; rats have partly been controlled in Alakai Preserve. Should any individuals be found, captive-breeding seems the only solution if this species is to be saved; searches in SE region of Alakai Swamp required.
Bibliography. Anon. (1983, 1998b), Banko (1980), Clement & Hathway (2000), Conant *et al.* (1998), Munro (1960), Pratt (1982, 1994), Pratt *et al.* (1987), Reynolds & Snetsinger (2001), Richardson & Bowles (1964), van Riper, C. (1991), van Riper, C. *et al.*(1986), van Riper, S.G. & van Riper (1985), Scott, Kepler, van Riper & Fefer (1988), Scott, Kepler & Sincock (1985), Scott, Mountainspring *et al.* (1986), Smith & Fancy (1998), Stattersfield & Capper (2000), Wakelee & Fancy (1999), Walther (1995), Warner (1968).

10. Olomao

Myadestes lanaiensis

French: Solitaire de Lanai **German**: Lanaiklarino **Spanish**: Solitario Olomao
Other common names: Lanai Thrush; Amaui (*woahensis*)

Taxonomy. *Phaeornis lanaiensis* S. B. Wilson, 1891, Lanai, Hawaiian Islands.
Formerly placed with *M. myadestinus*, *M. obscurus* and *M. palmeri* in a separate genus, *Phaeornis*. All previously regarded as conspecific, but differ vocally. Extinct form *woahensis* (often erroneously spelt *oahensis*), from Oahu, previously treated as a full species, but was probably a race of present species. Maui population, also extinct, possibly represented an undescribed race. Two extant subspecies recognized.
Subspecies and Distribution.
M. l. lanaiensis (S. B. Wilson, 1891) – Lanai, in Hawaiian Is.
M. l. rutha (Bryan, 1908) – Molokai, in Hawaiian Is.



Descriptive notes. 16–18 cm. Nominate race is dull brown above, with white-stippled ear-coverts, pale buffish patches at base of secondaries and primaries; whitish-grey below, pale buff on vent and undertail-coverts; bill and legs blackish. Distinguished from very similar *M. myadestinus* mainly by buff in wings. Sexes similar. Juvenile is flecked and spotted buff above, tail with whitish outer feathers, dark-scalloped below. Race *rutha* is possibly slightly larger and darker above than nominate, belly whiter. Voice. Song on Molokai (*rutha*), given from dawn to dusk and into night, a long, beautiful, halting and rather ventriloquial melody; nominate race reportedly silent or weak singer (this possibly function of tiny population size). Calls include cat-like rasp, also clear single call presumably like "police whistle" note of relatives.
Habitat. Closed-canopy mesic and wet forest, originally at all elevations. In 20th century only in montane rainforest, notably wet ohia (*Metrosideros polymorpha*) forest above 1200 m; this forest characterized by large number of epiphytes and understorey of olapa (*Cheirodendron trigynum*), pilo (*Coprosma*), pukiawe (*Styphelia tameiameiae*) and tree-ferns.
Food and Feeding. Primarily fruit, to lesser extent insects and land snails. Only fruit documented was that of olapa; diet probably similar to that of *M. obscurus*. Described as frequenting lower trees and forest underbrush on Lanai, but probably mostly a canopy-forager.
Breeding. Three inactive nests found on Molokai: bulky, loose cup of dried leaves, ferns, mosses, twigs and rootlets, two 25–30 m up in ohia tree in densely forested area, the other 25 m up in kolea tree (*Myrsine*) in lower-lying remnant forest. No other information.
Movements. Presumably sedentary.
Status and Conservation. CRITICAL. Possibly Extinct. Restricted-range species: present in Central Hawaiian Islands EBA. Population on Maui extinct before arrival of ornithologists. Probable race *woahensis*, from Oahu, also extinct; apparently common when discovered in 1825, but nothing further known. Almost ubiquitous in forest at all elevations on Molokai (race *rutha*) and Lanai (nominate) in 1890s, but not seen on Lanai since 1933 and long judged almost certainly extinct, following establishment of Lanai City and reduction of forest to less than 20 km² by early 1940s. By mid-1980s Molokai population, thought extinct in 1930s but rediscovered in 1964, estimated at 19 (± 38) individuals and appeared to have low probability of survival, but may still survive between Kamakou Peak and Pepeopae bog, and/or in extreme S of Olokui plateau, both areas above 1200 m; reports from late 1980s require confirmation. Disease vectored by introduced mosquitoes (Culicidae) probably the cardinal cause of the species' disappearance, abetted by spread into upland areas of wallow-creating feral pigs, and further compounded by extensive forest destruction. The two potential refuges are both protected, Kamakou Preserve and Olokui Natural Area, and programmes exist to prevent spread of feral ungulates, but all this appears to be too late for this species.
Bibliography. Anon. (1998b), Banko (1980), Clement & Hathway (2000), Loope & Medeiros (1995), Munro (1960), Olson (1996), Pekelo (1964), Pratt, H.D. (1982), Pratt, H.D. *et al.* (1987), Pratt, T.K. (1973), Reynolds & Snetsinger (2001), van Riper, C.(1991), van Riper, C. *et al.* (1986), van Riper, S.G. & van Riper (1985), Scott, Kepler, van Riper & Fefer (1988), Scott, Kepler & Sincock (1985), Scott, Mountainspring *et al.* (1986), Scott, Woodside & Casey (1977), Smith & Fancy (1998), Stattersfield & Capper (2000), Wakelee & Fancy (1999), Warner (1968).

11. Omao

Myadestes obscurus

French: Solitaire d'Hawaï **German**: Hawaiiklarino **Spanish**: Solitario Omao

Other common names: Hawaiian Thrush

Taxonomy. (*Muscicapa*) *obscura* J. F. Gmelin, 1789, Hawaiian Archipelago.
Formerly placed with *M. myadestinus*, *M. lanaiensis* and *M. palmeri* in a separate genus, *Phaeornis*. All previously regarded as conspecific, but differ vocally. Monotypic.
Distribution. Hawaii, in Hawaiian Is.



Descriptive notes. 18–19·5 cm; 49–52 g. Has grey-brown head with vague pale stippling from lores to ear-coverts, upperparts olive-brown; pale grey below, with whitish vent and undertail-coverts; bill and legs blackish. Differs from very similar *M. myadestinus* in slightly darker coloration above. Sexes similar. Juvenile is spotted whitish-buff above and on wing-coverts, scalloped grey-brown below, very like juvenile *M. myadestinus* but darker. VOICE. Song, from exposed perch, by both sexes throughout year (male more than female in non-breeding period), a pleasant jerky melody of liquid chirps, slurred flutings and short whistles, "whip-per-weeo whip-per-weet", lasting 2–5 seconds; by male also in display-flight. Subsong ("whisper song") similar, but soft and continuous for up to 20 seconds, usually from concealment in undergrowth; common in Oct. Calls include cat-like rasp in alarm, frog-like croak possibly as contact, twangy ascending series of buzzy notes possibly in mild stress, and high-pitched "police-whistle" trill for contact.
Habitat. Mesic and wet native forests above 1000 m, also (at lower densities) scrub and savanna, especially in areas holding ohia (*Metrosiderus polymorpha* = *M. collina*) and koa (*Acacia koa*) trees; distribution negatively correlated with that of introduced banana poka (*Passiflora mollissima*). Typical montane habitat characterized by closed forest canopy, with understorey including variety of fruiting trees, e.g. olapa (*Cheirodendron trigynum*), kolea (*Myrsine lessertiana*), kawau (*Ilex anomala*), naio (*Myoporum sandwichense*) and pilo (*Coprosma*), shrubs such as pukiawe (*Styphelia tameiameiae*), ohelo (*Vaccinium*) and akala (*Rubus hawaiiensis*), and ferns of various genera. Also, small population in treeless alpine scrub above 2000 m on Mauna Loa, in barren lava with patches of *Vaccinium*, *Coprosma*, *Styphelia* and aalii (*Dodonaea viscosa*).
Food and Feeding. Fruit, and lesser quantities of animal food. Plants used (fruits and berries, also flower bracts and flowers) include olapa, pukiawe, ohelo, akala, pilo, naio, kolea and koa, also painiu (*Astelia menziesiana*), alani (*Melicope clusifolia*), banana poka, kawau (*Photinia davidiensis*), uhi (*Smilax melastomifolia*), maile (*Alyxia oliviformis*), mamaki (*Pipturus albidus*), English holly (*Ilex aquifolium*), fire tree (*Myrica faya*), akia (*Wikstroemia*) and guava (*Psidium guajava*), formerly also (at elevations where species no longer occurs) ieie vine (*Freycinetia arborea*), olopua (*Nestegis sandwichensis*), kopiko (*Psychotria hawaiiensis*) and lama (*Diospyros sandwichensis*). Invertebrates, taken in small proportion throughout year (slightly more in spring and summer), mainly caterpillars and spiders but also beetles (Coleoptera), bugs (Hemiptera, including homopteran leafhoppers), snails, feather lice, mites (Acarina), flies (Diptera), earthworms and egg sacs. Analysis of 40 faecal samples indicated a 3:2 ratio of fruit to invertebrate consumption. Essentially same food, in roughly same proportions, fed to nestlings. Takes fruits mainly from understorey shrubs (0·5–3 m above ground) and trees (3–8·5 m above ground), but uses full range of forest canopy when foraging for invertebrates, gleaning arthropods from bare and mossy tree surfaces, terminal leaf clusters and understorey foliage; also makes aerial sallies for insects and still-hunts for invertebrates. Forages much more rarely on ground, except for high-elevation scrub population, which subsists on low-growing berries and terrestrial and low-growth invertebrates.
Breeding. Jan to end Oct, mainly mid-Mar (and especially from May) to end Aug; often double-brooded, but considerable period between nesting events. Territorialism not clear; area of at least 25 m radius around nest defended against conspecifics, and adults feed and roost within this area, but also occasionally voyage beyond boundaries. Nest an often bulky, loose cup of ferns, moss, leaves, rootlets and small twigs, usually lined with grasses or rootlets, sometimes pine needles or flower parts, placed in tree-fern (1–2 m up), cavity or tree fork (6–10 m up) or, in high-elevation population, on ground in lava formations or lava tubes. Eggs 1–2, greyish-white to tan with reddish-brown and lavender markings; incubation period 16 days; nestling period 17–21 days; post-fledging dependence 5–6 weeks; juveniles stay close to nest-site for at least 13 weeks after fledging, and may remain on natal territory for 6 months. Of 30 known-fate nests in 1994–1995, 43% fledged at least one young; of 13 successful nests, average 1·5 young produced; of 17 unsuccessful nests, 18% failed before incubation, 29% during incubation and 53% during nestling period, 47% for unknown reasons, 12% through abandonment and 24% from predation. Age of first breeding unclear; first-years pair and may attempt to nest. Average annual-survival probability 0·4 for juveniles, 0·66 for adults, although females appear to be at considerably higher risk than males (at one site, annual survival of males twice as high as that of females).
Movements. Sedentary; no evidence of roaming in search of fruiting trees outside breeding season, but juvenile emigration from parental territory greatest in Nov–May.
Status and Conservation. VULNERABLE. Restricted-range species: present in Hawai'i EBA. In 1890s abundant and widespread on Hawaii above 300 m; by mid-1970s only 25–30% of former range occupied. Now considered threatened owing to the few localities at which it survives, but generally doing well. Population estimated at 170,000 individuals in 1976–1979 (c. 113,000 in main body of range, c. 56,000 in high-elevation scrub on Mauna Loa), and judged to have increased in 1995. Densities in best rainforest habitat generally 200–300 birds/km²; home ranges vary from 1·62 to 4·51 ha, with no difference between male and female. Confined to area of 2590 km² in a single population or possibly divided by habitat breaks into 2–3 subpopulations, with attempts made to establish a free-living population through release of captive-bred birds in Puu Waawaa Wildlife Sanctuary, 1995–1998. Originally throughout Hawaii, but now restricted to S & E slopes, largely above 1000 m, in 25–30% of former range. Disappearance from lower elevations related to habitat destruction for firewood, timber and farmland, also to effects of disease (avian malaria and avian pox) vectored by introduced mosquitoes (Culicidae); introduction of a mosquito species tolerant of cooler temperatures of particular concern, although current evidence suggests that populations of this myadestine thrush may now be disease-resistant (disease-resistance strongly selected for at lower elevations, and believed to be spreading). Further pressure comes from spread into upland forests of feral predatory mammals, and replacement of native plants by non-native ones; introduced mammalian predators include small Indian mongoose (*Herpestes auropunctatus*), feral cat and three species of rat. Main conservation achievement in 1980–2000 was purchase, protection and management of much remaining forest above 1500 m, and close co-operation among agencies has led to creation of numerous parks, wildlife refuges and reserves dedicated to conserving Hawaiian native wildlife. Present species occurs in Hawaii Volcanoes National Park and several other protected areas. Control of pigs and mammalian predators being attempted by use of fencing and hunting, but rats represent a permanent problem.

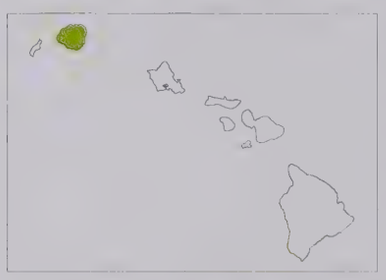
Bibliography. Anderson & Stone (1993), Anon. (1982, 1998b), Banko (1980), Berger (1969, 1972), Clement & Hathway (2000), Fancy, Jacobi *et al.* (1994), Fancy, Nelson *et al.* (2001), Feldman *et al.* (1995), Jacobi & Atkinson (1995), Kuehler, Lieberman, Harrity *et al.* (2001), Kuehler, Lieberman, Oesterle *et al.* (2000), Munro (1960), Pratt (1982), Pratt *et al.* (1987), Ralph & Fancy (1994), van Riper, C. (1991), van Riper, C. & Scott (1979), van Riper, C. *et al.* (1986), van Riper, S.G. & van Riper (1985), Scott, Kepler, van Riper & Fefer (1988), Scott, Kepler & Sincock (1985), Scott, Mountainspring *et al.* (1986), Smith & Fancy (1998), Stattersfield & Capper (2000), Wakelee (1996), Wakelee & Fancy (1999), Warner (1968).

12. **Puaiohi**

Myadestes palmeri

French: Solitaire puaïohi **German**: Palmerklarino **Spanish**: Solitario Puaiohi
Other common names: Small Kauai Thrush

Taxonomy. *Phaeornis palmeri* Rothschild, 1893, Halemanu, Kauai, Hawaiian Archipelago.
Formerly placed with *M. myadestinus*, *M. lanaiensis* and *M. obscurus* in a separate genus, *Phaeornis*. All previously regarded as conspecific, but differ vocally. Monotypic.
Distribution. Kauai, in Hawaiian Is.



Descriptive notes. 16·5–18 cm; 37–43 g. Plumage is slaty brown above, side of head paler, with white-stippled lores and ear-coverts, whitish eyering, whitish to buff-white on outer rectrices; white below, vague greyish-white malar, plain dirty buff breast; bill black; legs pink. Distinguished from similar *M. myadestinus* by greyer upperparts, white eyering, pale on outer tail, longer and thinner bill. Sexes similar. Juvenile is spotted whitish-buff above and on wing-coverts, scalloped grey-brown below, very like juvenile *M. obscurus* but face paler. VOICE. Song, apparently by male only, throughout day in breeding season, mostly in twilight, initially from exposed perch (frequently in display-flight) but later concealed, a series of almost unvarying phrases, each a short sneezy burst of high-pitched, reedy, squeaky hissing notes, of which "puaiohi" is an onomatopoeic rendition; given at low intensity when not breeding, but still occasional display-flight, although thought not then territorial. Subsong ("whisper song") a low-intensity version, used by first-year and by female in distraction display. Calls include short toneless rasping hiss, often repeated (up to ten per minute by territorial male), a whispered version of same, and harsher calls and low throaty growls in alarm. Wing-whirring sound in distraction and aggression, and bill-clacking in intraspecific aggression.
Habitat. Inaccessible ravines in high-elevation ohia (*Metrosideros*) forest, favouring streambanks with rich understorey of ferns, sedges and mosses, at 1050–1300 m. Historically, occupied mesic (*Acacia–Metrosideros*) to very wet (*Metrosideros–Syzygium–Cheirodendron*) montane forest with deeply dissected terrain, above 1000 m.
Food and Feeding. Fleshy native fruits and also invertebrates, particularly insects and snails. Fruits favoured include olapa (*Cheirodendron trigynum*) lapalapa (*C. platyphyllum*), ohia-ha (*Syzygium sandwichensis*), kanawao (*Broussaisia arguta*), ohelo (*Vaccinium*), painiu (*Astelia*), thimbleberry (*Rubus rosifolius*), pukiawe (*Styphelia tameiameiae*), kawau (*Ilex anomala*) and pilo (*Coprosma*); kolea (*Myrsine*), lobeliads (Lobelioideae) and mamaki (*Pipturus*) also taken. Invertebrates include dragonflies and damselflies (Odonata), weevils (*Rhyncogonus*), spiders, caterpillars, nematodes, beetles (Coleoptera), native snails and skinks (*Lampropholis delicata*). In non-breeding period, foraging attempts were 82% on fruit, 18% on invertebrates, but during brood-feeding attempts on invertebrates increase to 57%. Most foraging (75%) done in terminal fruit or leaf clusters in lower to middle canopy, with 16% in upper canopy, 8% on main branches in mid-canopy, 1% on ground or fallen logs; sometimes by hovering to pluck fruit or glean insects. Insects gleaned from terminal leaf clusters and extracted from moss, bark and mature fruit, especially that of *B. arguta*.
Breeding. Early Mar to early Sept, 60% of eggs laid Apr-May; up to four broods (and up to five breeding attempts) per year. Monogamous; some extra-pair copulations thought to occur. Average distance between nests in 1996 was 89 m; appears to use same breeding territory from year to year. Nest similar in structure to that of *M. townsendi*, a bulky cup composed of moss, liverworts and minuscule filmy ferns, lining woven of fine sedges, grass and leaves, placed on average 4·7 m up in cover of fern on cliff ledge or steep shaded bank next to small stream, occasionally in tree cavity. Eggs 2, off-white with greyish or greenish-blue tinge, or else brownish-mauve, with irregular brown, mauve and tan spots and squiggles; incubation period 13–14 days; 8% of nests monitored attended also by first-year or second-year individual (relationship to nest-owners unknown), which assisted in nest defence and provisioning of chicks; nestling period 16–22 days, mean 18·3 days; post-fledging dependence c. 4 weeks. Average time to renesting after failure 11·6 days, after successful fledging 13·3 days (male making 91% of feedings to fledglings while female incubates new clutch). During 1996–1998, 96 active nests monitored, mean 1·6 fledglings per successful nest, mean of 2·4 nesting attempts per territory, annual number of fledglings per territory 0·4–4·9 (mean 2·3); chicks preyed on by Common Barn-owl (*Tyto alba*) and Short-eared Owl (*Asio flammeus*), while feral cats and three species of rat possibly prey on newly fledged young. Age at first breeding 1 year, but evidence of helpers at nest indicates that some do not breed until 3 years. Wild-caught captive lived 11 years.
Movements. Sedentary. Two individuals each moved less than 150 m from natal site, and established breeding territories in following year.
Status and Conservation. CRITICAL. Restricted-range species: present in Central Hawaiian Islands EBA. Not very common in 1890s, when *M. myadestinus* was 100 times more abundant. Range contracted steadily in 20th century, during which present species went unreported until 1941 (two seen) and then 1960 (17 seen). Current population estimated at c. 200–300 individuals, confined to area of 32 km² in Alakai Wilderness Preserve (established 1964), where recently disappeared from the Waiau and possibly Halekua drainages, but expanding its range in Mohihi drainage. Formerly occurred in lowland areas, but retreated upslope in response to habitat destruction and effects of disease vectored by introduced mosquitoes (Culicidae); some may now be disease-resistant. Moreover, feral pigs have spread into upland areas, degrading forest understorey and creating wallows in which mosquitoes breed, and introduced rats suspected of causing nest losses and possibly of competing for food resources. Impacts of two hurricanes, in 1982 and 1992, possibly not so great as on other avian species, owing presumably to confinement to ravines. Rat-poison baits now placed near nests. Captive population established in 1996; 14 individuals released into the wild in Jan–Feb 1999, two of which dispersed farther than 3 km within 1 day of release, remainder settling within 1 week, eight establishing temporary home ranges with mean area 7·9 ha,

six establishing breeding home ranges with mean area 1·2 ha. Survival of the species depends on exclusion of introduced animals from current range.

Bibliography. Anon. (1998b), Ashman *et al.* (1984), Atkinson *et al.* (2001), Banko (1980), Berger (1972), Clement & Hathway (2000), Conant *et al.* (1998), Conrow (1999), Herrmann & Snetsinger (1997), Kepler & Kepler (1983), Kuehler *et al.* (2001), Lieberman & Kuehler (1998), Munro (1960), Pratt (1982, 1994), Pratt *et al.* (1987), Reynolds & Snetsinger (2001), Richardson & Bowles (1964), van Riper, C. (1991), van Riper, C. *et al.* (1986), van Riper, S.G. & van Riper (1985), Scott, Kepler, van Riper & Fefer (1988), Scott, Kepler & Sincock (1985), Scott, Mountainspring *et al.* (1986), Sincock *et al.* (1984), Smith & Fancy (1998), Snetsinger *et al.* (1999), Stattersfield & Capper (2000), Tweed *et al.* (2003), Warner (1968).

13. Townsend's Solitaire

Myadestes townsendi

French: Solitaire de Townsend **German**: Townsendklarino **Spanish**: Solitario Norteño

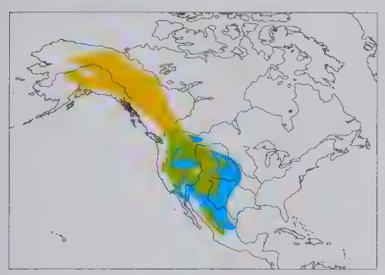
Taxonomy. *Ptiliogonys* [*sic*] *Townsendi* Audubon, 1838, Columbia River = near Astoria, Oregon, USA.

Two subspecies recognized.

Subspecies and Distribution.

M. t. townsendi (Audubon, 1838) – EC & S Alaska and NW & SW Canada S to W USA.

M. t. calophonus R. T. Moore, 1937 – N & C Mexico.



Descriptive notes. 20·5–21·5 cm; 30–35 g. Nominate race is grey-brown above, slightly paler and greyer below; white eyering, greyish-white edges of wing-coverts and tertials, pale buffy bases of primaries and secondaries, long blackish tail with white tips and outer feathers; bill and legs blackish. Sexes similar. Juvenile is slightly darker than adult, heavily speckled whitish above and below, with whitish eye-ring. Race *calophonus* is slightly darker and browner than nominate, with wing patches deeper-coloured, more ochraceous. Voice. Song, typically in open from treetop (sometimes, in summer, in display-flight from treetop), a celebratedly clear and rich, if slightly mechanical, set of rapidly warbled notes, finch-like and disjointed, sometimes run together continuously, sometimes broken up into short phrases by brief pauses, sometimes changing abruptly in pitch; in winter, some singing can be very soft ("whisper singing"). Four calls described: high, clear, ringing mournful whistle, "tew" or "heeh", sometimes singly, often in repeated series, used in territorial behaviour; harsh "waa", in interspecific aggression in winter; low single "chirk" during food exchange; and harsh raspy "kree" as alarm in summer, similar to but longer and purer than "waa" call.

Habitat. Breeds in variety of montane coniferous forest types, to beyond tree-line, typically in tracts with various dominant pines (e.g. *Pinus lambertiana*, *P. contorta*), hemlocks *Tsuga* (and *Pseudotsuga menziesii*), firs (e.g. *Abies magnifica*) and spruces (e.g. *Picea engelmanni*); in Rocky Mts found in all major conifer communities, including mixed conifer, spruce–fir and cedar–hemlock. Elevational range depends on latitude, overall from 350 m to 3500 m. In Mexico, race *calophonus* inhabits arid to semi-arid conifer and pine–oak (*Pinus–Quercus*) forest, at 1800–3500 m when breeding; also in oak woodland in winter, 1500–3000 m. Prefers relatively open areas, such as forest thinned by minor fires or logging, usually with sparse shrub layer, and forest edge. Winter range correlated with distribution of juniper trees (*Juniperus*): primary habitat juniper or piñon–juniper (*Pinus–Juniperus*) woodland, and evidence of preference for areas with 3–4 sympatric juniper species over those with just one or two species. On migration, found also in valley bottoms, riparian forest and suburban areas.

Food and Feeding. When breeding, mainly insects and spiders supplemented by berries in late summer; in winter, various berries and small fruits, but principally the fleshy female cones ("berries") of junipers. Summer invertebrate diet includes caterpillars most commonly, also beetles (Coleoptera), ants (Hymenoptera) and dampwood termites (*Zootermopsis angusticollis*), also many unidentified flying insects; adults intercepted when bringing food to nest commonly regurgitate larvae of lepidopterans and sawflies (Tenthredinidae), small cicadas (Homoptera) and spiders. Vegetable diet very largely, in some areas exclusively, juniper berries of various species, e.g. one-seed (*J. monosperma*), western (*J. occidentalis*), Rocky Mountain (*J. scopulorum*) and, for wanderers, eastern redcedar (*J. virginiana*); only other significant winter food reported in juniper woodland is mistletoe (*Phoradendron*), 3–7% of one sample. In autumn and in winter areas away from juniper woodland, diet includes fruit of mountain ash (*Sorbus americana*), crab apple (*Malus*), holly (*Ilex verticillata*), buckthorn (*Rhamnus cathartica*), currant (*Ribes*), service (*Amelanchier alnifolia*), hawthorn (*Cratageus*), cherry (*Prunus*), hackberry (*Celtis*), roschips (*Rosa*), sumac (*Rhus*), waxwork (*Celastrus*), honeysuckle (*Lonicera*), elderberry (*Sambucus*) and others. Also, seeds and flower fragments found in stomachs. Forages in variety of ways: sally-pounces on invertebrates on tree trunks and on ground, launching attack from 1–3 m up and typically covering 1–10 m from perch to prey; relatively less often, as summer foraging technique, makes aerial sallies of 1–30 m from treetop perch to take flying insects, often above forest canopy; also, mainly in winter, plucks berries from perch or in sally-hover, also from ground. Mostly territorial throughout year, holding individual winter feeding territories varying from 0·01 ha to more than 5 ha; in one study, skulking floaters detected.

Breeding. May–Aug; double-brooding relatively infrequent, e.g. seven attempts at second brood in 36 cases where first brood successful. Partners may stay together over several years; one instance of divorce and re-pairing by female between first and second broods. Breeding territory variable in size, presumably dependent on habitat, two in Montana 2·8 ha and 6·0 ha, and 50 in California in range 10–20 ha. Nest a cup of twigs, weed stems, rootlets and moss, with cup of pine needles lined with grass stems or thin bark strips, placed almost always on ground in nook or hollow in shelter of overhanging object such as rock, log, tree root, leaning tree or shrub stem, rarely 0·1–3·5 m up in decaying stub or live tree; in British Columbia and Montana, bases of vertical earth banks along road-cuts constituted more than 90% of recorded sites, but possible observer bias owing to ease of detection; in California study, with eliminated search bias, 89% of sites in forest interior (both closed-canopy stands and small clearings with no canopy cover) and only 11% in road-cut earth banks; replacement nests built repeatedly (up to four times) and located in different parts of territory. Eggs 3–5, mostly 4 (69% in one study), variably dull white, pale grey, greyish-blue, greenish-blue, greyish-beige or pale pink, with purple to brownish spots and blotches; incubation period 11–13 days (mean 12 days); nestling period 9–15 days (mainly 10–12 days), young less than 14 days old incapable of full flight but can hop long distances (100 m in first 6 hours in one instance) and hide on perches in low undergrowth; post-fledging dependence at least 14 days. Brood parasitism by cowbirds (*Molothrus*) low. In one study, 36 of 76 nests over three years successfully fledged at least one young, 90% of failures due to predation of nest or female; 2·8–3·6 young per successful nest, but only 1–2 young when all nests combined (including failed ones); nest predation by squirrels and skunks common. Maturity reached sometimes at 1 year. Oldest recorded individual in one study was 5 years, average return rate of marked individuals to winter territory 56%; in another study, 30% of individuals establishing feeding territory in autumn disappeared before following spring, evidence suggesting that they had died.

Movements. Most populations apparently make only short-distance altitudinal movements to lower areas in winter, and in a few areas resident. N breeders (of nominate race) undertake long-distance migrations; some non-breeding visitors in N Mexico possibly originate from extreme N of range. In California, of 52 individuals marked on winter territories at 1555 m, nine were found breeding at 1575–1815 m within 2·2 km of winter areas, whereabouts of others unknown. Altitudinal migration in California peaks mid-Mar to mid-Apr and Sept–Oct. Non-breeders present Minnesota Sept–Apr, Wisconsin Oct–May, Illinois and Mexico Oct–Apr, Missouri Dec–Mar. In Alberta, latitudinal migration covers early Apr to late May, and late Aug to Oct.

Status and Conservation. Not globally threatened. Reasonably common in North America. Population stable or possibly slightly increasing. Deforestation in breeding and winter ranges destroys key habitats, yet no long-term effects recorded. Some anthropogenic impacts (burning, logging) may improve breeding habitat. Over three summers, one 400-ha plot with some unsuitable scree fields held 16–17 pairs, along with uncounted number of unpaired males. Average winter density 0·96 birds/ha (96/km²). In Mexico, uncommon to fairly common resident and irregular (rare to fairly common) winter visitor.

Bibliography. Anon. (1998b), Beal (1915), Bent (1949), Bock (1982), Borror & Halafoff (1969), Bowen (1997), Bowles & Decker (1927), Clement & Hathway (2000), Cutright (1980), Dawson (1919), DeGraaf & Rappole (1995), Erickson & Wurster (1998), Friedmann *et al.* (1957), George (1987), Godfrey (1986), Hanford (1917), Howell & Webb (1995), Kramer (1980), Lange (1988), Lederer (1977a, 1977b, 1981), van Ommeren & Whitham (2002), Phillips (1991), Poddar & Lederer (1982), Ritchie *et al.* (1982), Root (1988), Russell & Monson (1998), Salomonsen & Balda (1977), Shambaugh (1987), Sibley (2000), Strong (1983), Sullivan (1976), Svingen (1993).

14. Brown-backed Solitaire

Myadestes occidentalis

French: Solitaire à dos brun **German**: Braunrückenklarino **Spanish**: Solitario Dorsipardo

Taxonomy. *Myadestes obscurus* var. *occidentalis* Stejneger, 1882, Tonila, Jalisco, Mexico.

Scientific name formerly *M. obscurus*, but that became preoccupied when *Phaeornis* merged with present genus. Proposed race *cinereus* (from NW Mexico) synonymized with nominate. Three subspecies recognized.

Subspecies and Distribution.

M. o. occidentalis Stejneger, 1882 – W & EC Mexico.

M. o. insularis Stejneger, 1882 – Tres Marias Is, off W Mexico.

M. o. oberholseri Dickey & van Rossem, 1925 – C & S Mexico S to Guatemala, El Salvador and Honduras.



Descriptive notes. 20·5–21·5 cm; 38–44 g. Nominate race has black lores and narrow, often ill-defined white supraloral line, broken white eyering, white submoustachial stripe, black malar, white chin and upper throat; rest of head dull darkish grey, shading to olive-rufous on rump and tail and richer rusty brown on scapulars and wing edgings; white tips of outer rectrices; breast dull darkish grey, shading to paler grey below; bill black; legs greyish-pink. Sexes similar. Juvenile is like adult but with brown-edged whitish-buff body feathers, giving spotted or scalloped effect. Race *insularis* is slightly greyer on mantle and back than nominate, has more white on throat; *oberholseri* is more extensively and slightly deeper grey below, legs reddish-brown. Voice. Song, usually from concealed perch (and characteristic of highland forest), highly ventriloquial, a hesitantly starting, slowly descending sweet whistling, accelerating into squeaky, metallic jangling, jumbled crescendo; perhaps given in fullest form only in descent phase of display-flight. Calls include metallic, slightly whining, upslurred "wheeu" or "yeeh", and nasal rasping "shiehh" as alarm.

Habitat. Dense humid to semi-arid evergreen, semi-deciduous and pine–oak (*Pinus–Quercus*) forest, cloudforest, brushy ravines, often along streams (especially when vegetation greener than surrounding habitat). At 600–3500 m (to at least 1900 m in Honduras); lower in winter, down to 300 m in W Mexico (Sonora).

Food and Feeding. Fruit, especially of *Bumelia* and *Prunus*. Forages mainly in lower to middle levels of forest, also in clearings.

Breeding. Feb–Jul; may possibly extend into Sept (copulation also seen end Jul) and breed at successively higher elevations with advent of summer rains. Nest a cup either externally of moss, lined with pine needles or arborescent lichen, or made entirely of pine needles, placed on or near ground in depression on sloping bank, tucked behind exposed roots, or at base of sapling or boulder in forest. Eggs 2–3, brownish-white to creamy white with heavy reddish-brown streaks and spots; no information on incubation period; nestling period c. 17 days.

Movements. Apparently sedentary in most of range; descends lower in winter locally in W Mexico, and in Sonora disappears to lower elevations in Aug–Mar.

Status and Conservation. Not globally threatened. Fairly common to common throughout range. Common breeder in Mexico on Cerro San Felipe and near Cerro Baúl (Oaxaca). Fairly common resident in highlands in W Honduras.

Bibliography. Anon. (1998b), Binford (1989), Clement & Hathway (2000), Friedmann *et al.* (1957), Gibson (1993a, 1994), Howell & Webb (1995), Land (1970), Monroe (1968), Nelson (1899), Phillips (1991), Rowley (1966, 1984), Russell & Monson (1998), Schaldach (1963), Skutch (1967), Sutton (1951), Wagner (1955), Watson (1999).

15. Cuban Solitaire

Myadestes elisabeth

French: Solitaire de Cuba **German**: Kubaklarino **Spanish**: Solitario Cubano

Taxonomy. *Muscicapa elisabeth* Lembeye, 1850, Cuba.
Two subspecies recognized.
Subspecies and Distribution.
M. e. elisabeth (Lembeye, 1850) – W & E Cuba.
M. e. retrusus Bangs & Zappey, 1905 – I of Pines.



Descriptive notes. 19–20·5 cm; 21·5–33 g. Nominate race has narrow whitish eyering, dull whitish lores and broad submoustachial area, dark brown malar line; rest of head and upperparts olive-brown, with warmer brown tertials, base of secondaries and edges of primaries; whitish outer tail feathers; chin to vent dull whitish, slightly greyer across breast; upper mandible blackish, lower horn-coloured with dusky tip; legs yellowish-brown. Sexes similar. Juvenile is fairly similar to adult, but flecked and streaked buff above, mottled brown on breast and flanks. Race *retrusus* is slightly greyer above than nominate, with pale buff preocular supercilium, almost pure white below, bill reportedly different. Voice. Song loud, ringing, flute-like and melodious, ventriloquial and far-carrying, "like rubbing a wet finger against the rim of a fine porcelain cup", similar to that of *M. genibarbis*. Call short and whistle-like.
Habitat. Dense humid hill and montane semi-deciduous and pine (*Pinus*) forest; mainly in canopy; appears to need steep limestone cliffs for nesting.
Food and Feeding. Insects and fruit, including ripe palm nuts. Forages by sallying from perch to catch flying prey, to glean insects from leaves, and to hover-pluck fruit from trees and bushes. Most foraging done in canopy, but on slopes may descend close to ground.
Breeding. Feb–Jul. Nest a cup of fine fibres, rootlets and hair, covered with moss, lichen and plant down, placed in moist rock crevice or tree hole hidden among ferns and mosses. Eggs 3, pale green with heavy brown spotting. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Common but rather local; in W Cuba found only in Sierra de los Órganos, Sierra del Rosario and Sierra de la Güira, and in E Cuba in Sierra Maestra, Sierra del Magüey, Sierra de Moa, Toa and Baracoa. Sensitive to habitat change, and thought to be at some risk owing to continuing habitat loss. Population stronghold of Pinar del Río province considered relatively secure, but forest elsewhere being converted to farmland and plantations. Race *retrusus* on I of Pines almost certainly extinct, believed to have died out in 1930s, although reported in about 1970.
Bibliography. Anon. (1998b), Bangs & Zappey (1905), Barbour (1923), Bond (1956b, 1979), Clement & Hathway (2000), Dinerstein *et al.* (1995), García (1980), Garrido & Kirkconnell (2000b), Mitchell & Wells (1997), Phillips (1991), Raffaele *et al.* (1998), Stattersfield & Capper (2000), Todd (1916).

16. Rufous-throated Solitaire

Myadestes genibarbis

French: Solitaire siffleur **German**: Bartklarino **Spanish**: Solitario Gorgirrufo
Other common names: Rufous-brown Solitaire; St Vincent Solitaire (*sibilans*)

Taxonomy. *Myidestes* [sic] *genibarbis* Swainson, 1838, Africa or India; error = Martinique.
Six subspecies recognized.
Subspecies and Distribution.
M. g. solitarius S. F. Baird, 1866 – Jamaica.
M. g. montanus Cory, 1881 – Hispaniola.
M. g. dominicanus Stejneger, 1882 – Dominica.
M. g. genibarbis Swainson, 1838 – Martinique.
M. g. sanctaeluciae Stejneger, 1882 – St Lucia.
M. g. sibilans Lawrence, 1878 – St Vincent.



Descriptive notes. 19–20·5 cm; 24–30 g. Nominate race has white crescent below eye, orange-flecked face, whitish chin and whitish base of submoustachial separated by dark malar; otherwise, slate-grey above, with black primary coverts and bases of secondaries, white bases of inner primaries (small white wing square), pale borders of flight-feathers; whitish outer tail feathers; throat chestnut, breast and forepart of flanks medium grey, belly and vent ochraceous-tawny; bill black; legs yellowish. Sexes similar. Juvenile is dark with distinct orange-buff spots and streaks above, orange-buff and slaty scalloping below, with plain orange-buff vent to undertail-coverts. Race *solitarius* is slightly larger than nominate, with longer tail, slightly brighter throat; *montanus* has shorter tail, and is paler-throated, with ear-coverts barely marked; *dominicanus* has broader streaks on ear-coverts, darker grey, especially on underparts, which are also more extensively grey; *sanctaeluciae* has slightly paler rfuous throat than previous, with more white in tail and more orange on lower belly; *sibilans* is much darker above and paler below, with thin black malar extending to shoulder below ochraceous-rufous stripe, throat colour less clearly delimited from that of breast. Voice. Song, throughout year but most commonly in May, from concealed treetop perch, a "hauntingly beautiful minor-key whistle", highly ventriloqial, a series of clear and semi-discordant flute-like whistled notes coming slowly through the air, first note low, second high, third low, interspersed with ringing double note; or sometimes as "twuit, toi, tu-tu-tu-tu". Calls include single long "toot" like distant car horn.
Habitat. Dense, moist montane forest, both pure broadleaf and broadleaf mixed with pine (*Pinus*), also scattered groves along streams in open upland meadows.
Food and Feeding. Fruits and insects. Vegetable food includes pokeberry (*Phytolacca rivinoides*) and palo amargo fruit (*Colubrina berteroana*); in Jamaica also *Phytolacca icosandra* (Phytolaccaceae), *Alchornia latifolia* (Euphorbiaceae), *Heterotrichum umbellatum*, *Miconia quadrangularis*, *M. dodecandra* and other unidentified Melastomataceae, *Oreopanax capitatus* and *Dendropanax arboreus* (Araliaceae), *Psychotria brachiata* (Rubiaceae), as well as introduced *Pittosporum undulatum*, found along mountain trails. Strictly arboreal, although often low in vegetation when feeding, and young often terrestrial. Food items frequently taken in aerial sallies, plucking fruit, gleaning and hawking insects; insects also taken in perch-and-pounce drop to ground.
Breeding. Mar–Aug; May in Haiti, and May–Jul in E Caribbean. Cup-nest, usually placed in crevice, creeper, top of tree-fern or bromeliad, bank or tree hole. Eggs 2–3, bluish-white or blue with reddish-brown spots.
Movements. Apparently at least a partial altitudinal migrant, in cold weather moving lower in Dominican Republic, where once recorded at 500 m in Mar. In Jamaica, part of population moves in Nov from highlands to middle levels and even into lowlands, ascending again in late Mar to middle elevations, then often remaining there until late May, moving higher again in Jun.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA, Hispaniola EBA and Lesser Antilles EBA. Fairly common in Jamaica, and on Dominica, Martinique, St Lucia and St Vincent. In Hispaniola, fairly common in Dominican Republic, but numbers much reduced in Haiti owing to habitat loss.
Bibliography. Anon. (1998b), Bond (1956b), Bond (1979), Clement & Hathway (2000), Cruz (1976), Diamond (1973), Downer & Sutton (1990), Evans (1990), Goodbody (1996), Lack (1976), Panton (1999), Raffaele *et al.* (1998), Stockton (1987), Stockton (1992), Wetmore & Swales (1931), Wetmore & Lincoln (1933), Woods & Ottenwalder (1986).

17. Slate-coloured Solitaire

Myadestes unicolor

French: Solitaire ardoisé **German**: Schieferklarino **Spanish**: Solitario Unicolor
Other common names: Slaty Solitaire

Taxonomy. *Myiadestes unicolor* P. L. Sclater, 1857, Córdova, Veracruz, Mexico.
Proposed races *pallens* (from Nicaragua) and *veraepacis* (highlands of Guatemala and N Honduras) appear indistinguishable in long series. Treated as monotypic.
Distribution. S Mexico (from Hidalgo) S to Guatemala, S Belize, N & E Honduras, N El Salvador and Nicaragua.



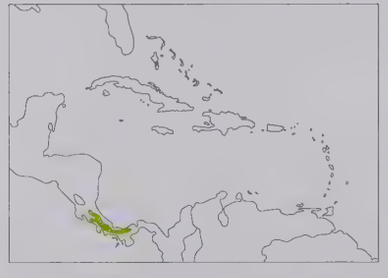
Descriptive notes. 19–20·5 cm; 30–44 g. Plumage is dark slaty grey above, slightly paler below, with blacker primary coverts, buff-edged black flight-feathers, whitish-grey outer tail feathers, broken whitish eyering; bill dark; legs yellowish. Sexes similar. Juvenile is dark, with black-edged buff spots above, buffish moustachial streak, whitish-buff feather centres (scaly-looking) below. Voice. Song ethereal, haunting, characteristic sound of local cloudforest; often starts hesitantly with a few poor notes, then breaks into varied series of clear or quavering fluty whistles, carefully delivered but of great beauty, often including or ending with loose trill, e.g. "weedu teee wheeoee du du whit whit whit... du-whip! Drrrreee teedle-o chup chup chup...". Calls include hard nasal "rrank" or "rran" and buzzier "zzrink".
Habitat. Humid evergreen and *Pinus*–evergreen forest, and cloudforest-like (rich in lichens and bryophytes) habitat on ridges and associated ravines, at 780–2700 m. Replaces *M. occidentalis* in more humid conditions in Honduras.
Food and Feeding. No information.
Breeding. Apr in Mexico (Oaxaca). Nest typically made of moss, placed on ground amid forest debris on side of ravine. Eggs 2–3, whitish with reddish-brown markings. No other information.
Movements. Some post-breeding descent to near sea-level in S Veracruz (Sierra de los Tuxtlas), in Mexico, and in Belize; similarly, recorded in Feb–Mar at lower levels in El Salvador.
Status and Conservation. Not globally threatened. Fairly common to common. Common resident of cloudforest throughout Honduras. Populations in E Mexico have been reduced, and possibly extirpated, owing to capture for the cagebird trade.
Bibliography. Anon. (1998b), Binford (1989), Friedmann *et al.* (1957), Greenberg *et al.* (1997), Howell & Webb (1995), Howell *et al.* (1992), Land (1970), Lee Jones (2004), Monroe (1968), Phillips (1991), Rowley (1984), Russell (1964), Skutch (1967), Winker *et al.* (1999).

18. Black-faced Solitaire

Myadestes melanops

French: Solitaire masqué **German**: Maskenklarino **Spanish**: Solitario Carinegro

Taxonomy. *Myiadestes melanops* Salvin, 1865, Tucurrique, Costa Rica.
Vocally similar to *M. coloratus* and *M. ralloides*, and all three sometimes considered conspecific, but plumage differences argue for treatment as separate species. Monotypic.
Distribution. Costa Rica and W Panama.



Descriptive notes. 16–18·5 cm; 30–33 g. Plumage is slate-grey, slightly paler below, with black forehead and face, black wings with pale-edged flight-feathers, and black tail with white outer feathers; narrow yellowish eyering; bill yellow-orange; legs yellowish. Sexes similar. Juvenile resembles adult, but body feathers browner, with buffy-orange spots and streaks above, buff submoustachial stripe, buff suffusion below. Voice. Song, by both sexes, a leisurely, drawn-out series of well-separated phrases, with ethereal quality and usually of great beauty (less impressive songs probably from younger birds), involving high, thin clear whistles with fluty transitions, liquid undulations and occasional metallic notes with overtones, "teedleedléé... teedléé... lee-dah... lee-doo...". Calls include upslurred nasal "ghank" or throaty clanging "rraou", liquid "quirt", and drier, buzzier "schwee" in alarm.
Habitat. Wet mountain forests, mainly in dense understorey of shrubs and bamboo, but frequently ascending into canopy to forage or sing; also wooded brush-choked ravines amid pastures and fields. Will visit isolated fruiting trees in pastures or semi-open situations and young second growth. At 750–2940 m. Can persist in small patches of woods left after general deforestation, in dense tangled shrubbery and stands of tall bamboo.

Food and Feeding. Many kinds of fruit, including berries, palm fruits, and also *Witheringia solanacea*; also takes insects. Plucks berries and arillate seeds while perched or sometimes in hovering sally. May form loose foraging flocks in non-breeding season, and ranges near army-ant swarms.
Breeding. Apr–Jun in Costa Rica. Nest is a variably sized cup of green moss and liverworts, lined with dark fibrous rootlets and stems of mosses and liverworts, placed 1–5 m up in niche in mossy bank, crevice in tree trunk, or mass of moss in vertical fork. Eggs 2–3, white to pale pinkish with dull chestnut or bright rufous-brown spots; incubation period 12–13 days; nestling period 15–16 days.
Movements. Sedentary and also partial seasonal altitudinal migrant in Costa Rica, many birds moving lower after breeding, regularly to 450 m, occasionally 100 m, at least on Atlantic slope. In Panama, likewise, a late-Oct record at sea-level in Bocas del Toro indicates seasonal altitudinal movement.
Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. In Costa Rica, considered to be common in less accessible areas and protected areas, and generally most abundant at 900–1500 m in lower mid-altitudes, in cool wet forest, but in many regions numbers greatly diminished by trapping for the cagebird trade and by habitat destruction. Fairly common to common in Panama, where perhaps most numerous in W Chiriquí.
Bibliography. Anon. (1998b), Barrantes & Pereira (2002), Carriker (1910), Clement & Hathway (2000), Murray (1987), Murray *et al.* (1994), Phillips (1991), Ridgely & Gwynne (1989), Sekercioglu *et al.* (2002), Skutch (1967), Slud (1964), Sousa *et al.* (1982), Stiles & Skutch (1989), Wetmore *et al.* (1984), Witmer (1996c).

19. **Varied Solitaire**

Myadestes coloratus

French: Solitaire varié **German**: Buntklarino **Spanish**: Solitario Variado

Taxonomy. *Myadestes coloratus* Nelson, 1912, Mount Pirri, near head of River Limón, eastern Panama.
Vocally similar to *M. melanops* and *M. ralloides*, and all three sometimes considered conspecific, but plumage differences argue for treatment as separate species. Monotypic.
Distribution. E Panama and extreme NW Colombia.



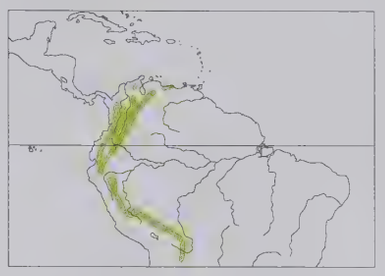
Descriptive notes. 16–18 cm; 24–34 g. Has pale slate-grey head and underparts, smudgy blackish forehead, face and chin, warm brown mantle to upperwing-coverts and uppertail-coverts; primary coverts, most flight-feathers and tail blackish, outer tail paler and with tips pale grey; bill and legs yellow. Intermediate in coloration between *M. melanops* and *M. ralloides*. Sexes similar. Juvenile is olive-brown with whitish and buffy spots and streaks above, warm brown wingpanel, black tail, white-spotted brownish underparts. Voice. Song a leisurely series of drawn-out single notes or flute-like phrases with intervening pauses of 3–6 seconds, sometimes with a few less musical notes interspersed; resembles that of *M. ralloides*.
Habitat. Montane cloudforest in foothills and highlands, generally at 1100–1500 m; found also at c. 900 m on summit of Cerro Quía, in Panama.
Food and Feeding. Few data. Sometimes joins tanagers (Thraupidae) and other birds in fruiting trees.
Breeding. In Panama, breeding-condition bird in Apr, and full-grown juveniles and recently fledged young in late May and early Jun. No other information.
Movements. Presumably sedentary; perhaps some elevational displacements.
Status and Conservation. Not globally threatened. Restricted-range species: present in Darién Highlands EBA. Generally fairly common to common throughout; in Panama, numerous on Cerro Pirre above 1350 m. Present in Darién National Park, in Panama, and Los Katíos National Park, in Colombia.
Bibliography. Anon. (1998b), Clement & Hathway (2000), Hilty & Brown (1986), Phillips (1991), Ridgely & Tudor (1989), Robbins *et al.* (1985), Wetmore *et al.* (1984).

20. **Andean Solitaire**

Myadestes ralloides

French: Solitaire des Andes **German**: Andenklarino **Spanish**: Solitario Andino

Taxonomy. *Muscipeta ralloides* d'Orbigny, 1840, Chulumani, Yungas, east side of the Cordillera, Bolivia.
Vocally similar to *M. melanops* and *M. coloratus*, and all three sometimes considered conspecific, but plumage differences argue for treatment as separate species. Races *plumbeiceps* and *venezuelensis* doubtfully distinct. Four subspecies recognized.
Subspecies and Distribution.
M. r. plumbeiceps Hellmayr, 1921 – W Colombia and W Ecuador.
M. r. candelae Meyer de Schauensee, 1947 – NC Colombia.
M. r. venezuelensis P. L. Sclater, 1856 – N & W Venezuela S in E Andes to N Peru (N of R Marañón).
M. r. ralloides (d'Orbigny, 1840) – Peru (S of R Marañón) S to W & C Bolivia (S to Chuquisaca).



Descriptive notes. 17–18 cm; 25·5–37 g. Nominate race has black lores, dull greyish-olive crown, shading to reddish-brown from mantle to rump and scapulars; dark tips of primary coverts and bases of secondaries; face to underparts dull mid-grey; bill dusky; legs pale brown. Sexes similar. Juvenile is like adult, but with pale buff spotting above and dark stippling below. Race *plumbeiceps* is slightly richer brown above than nominate, has whole crown grey, base of lower mandible dark yellow; *candelae* is dark tawny on crown and upperparts, breast darker grey; *venezuelensis* is brighter, tawnier brown above, crown mainly brown, with only forehead grey, flanks more olive, legs yellowish. Voice. Song, from concealed perch in lower canopy of tall tree, given all year (but mainly when breeding and at dawn and dusk), ventriloquial, on W slope of Andes very beautiful, a leisurely, loud, lilting series of well-spaced phrases consisting of pure, flute-like liquid notes, sometimes interspersed with more guttural, gurgling ones, "tliii... liidl-ii... turdelii... triilii... lur-lur... iii-uuu..."; on E slope shriller and less flute-like, with sometimes more jumbled phrases and longer intervals, but songs from S Táchira (Venezuela) considered most melodious of all; female song poorer. Occasional subsong a protracted performance, reminiscent of song of *M. townsendi*. Also has little-known flight song, basically a greatly accelerated version of perched song to become a jumble of musical notes that recalls song of some *Atlapetes* brush-finches, delivered as bird flies out over forest. Calls include throaty, wheezy downslurred whistling clang, "rraou", in alarm or anxiety.
Habitat. Lower and middle growth (2–15 m) of humid and wet foothill and subtropical forest, borders and shady taller secondary woodland, commonly in vicinity of mountain streams and in ravines. Altitudinal limits 650–2900 m, found mostly at 1200–2700 m; down to 800 m and locally 600 m on Pacific slope in Colombia; 900–2800 m (accidentally to 4500 m) in Venezuela.
Food and Feeding. Insects and fruit. Takes fruit and berries while perched or by sally-gleaning; also gleans foliage, and sallies into air for insects. Usually not in mixed-species flocks, but regularly visits small fruiting trees (e.g. Melastomataceae), especially when other species (including mixed flock) present; rarely visits ground, but regularly follows army-ant swarms through undergrowth.
Breeding. Mar in Colombia, and breeding-condition birds in Mar–Apr and Jul and juveniles all months except Feb and Apr in Andes; probably breeds Feb–Jun, sometimes extending to Aug, rarely later. Singing males (not necessarily breeding) often as little as 50 m apart. Nest a moss cup, lined with rootlets and bracts, placed on well-drained bank or log, sometimes at forest edge. Eggs 2, dull white or creamy white with reddish-brown speckles. No other information.
Movements. Mostly sedentary so far as is known; in Colombia, individual ringed at 1400 m was retrapped a week later 5 km away at 1200 m.
Status and Conservation. Not globally threatened. Fairly common to common throughout Andean range. Common in Chocó, in W Colombia; common in Venezuela. Often common in Ecuador on basis more of vocal evidence than of visual records, and common in Podocarpus National Park.
Bibliography. Chapman (1917, 1926), Clement & Hathway (2000), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hilty (2003), Hilty & Brown (1986), Miller (1963), Parker *et al.* (1985), Phelps & Phelps (1950), Rasmussen *et al.* (1994), Renjifo (1999), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Rodríguez (1982), Salaman (1994), Walker (2001), Wallace (1965).



Subfamily TURDINAE

Genus *CATAPONERA* Hartert, 1896

21. **Sulawesi Thrush**

Cataponera turdoides

French: Cataponère des Célèbes **Spanish**: Zorzal Montano de Célebes
German: Schwarzbrauendrossel
Other common names: Sulawesi Mountain/Celebes Mountain Thrush, Cataponera Thrush

Taxonomy. *Cataponera turdoides* Hartert, 1896, Bonthain Peaks, Sulawesi.
Systematic position unclear, further study needed. Balance of evidence, e.g. voice, singing behaviour, tail-raising habit, flushing behaviour and distinct juvenile plumage, just favours treatment within present family; alternative treatment in Timaliidae also tenable, however, on basis of black eyebrow, short curved wing, rounded tail, bare orbital skin and foraging behaviour. Four subspecies recognized.
Subspecies and Distribution.
C. t. abditiva Riley, 1918 – NC Sulawesi.
C. t. tenebrosa Stresemann, 1938 – S Sulawesi.
C. t. turdoides Hartert, 1896 – SW Sulawesi.
C. t. heinrichi Stresemann, 1938 – SE Sulawesi.
Descriptive notes. 20–25 cm. Nominate race has dark brown crown and distinctive broad black line from lores through supercilium to nape; dull olive-tinged mid-brown above, with darker, warmer brown wings and tail; paler olive grey-brown below, becoming whitish on belly and vent; bill, eyering and legs orange-yellow. Sexes similar. Juvenile is like adult, but scaled below. Race *abditiva* is richer brown above, with orange-brown underwing-coverts, pale rufous belly and vent, less or no black on lores; *tenebrosa* is more greyish olive above, less olive below; *heinrichi* has less black on face and sides of head, with much reduced black supercilium. Voice. Song, from exposed perch 3–6 m up in open forest, given in twilight, a pleasant melody consisting of a series of short, rich, fluty, mournful phrases, "toowip tu-wee... tu tee-tu-tee... tuee wip-wip-wip-wip-wip", recalling that of *Turdus philomelos*; sometimes more complex when mimicry incorporated. In morning may give more subdued version, introduced by short whistled phrases of 6–8 notes repeated up to ten times. Calls include a chatter and a thin "tsiip".



Habitat. Occupies montane evergreen forest and moss-forest with dense undergrowth, at 1100–2400 m.
Food and Feeding. Small mid-storey fruits, and invertebrates and other material from understorey and ground. Forages on ground and in lower storeys of forest, probing mossy fronds, epiphytes and tree-ferns, hopping along horizontal branches. Sometimes follows secretive Malia (*Malia grata*) in middle storey or joins other mixed-species flocks; may occur singly or in groups of up to four individuals.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sulawesi EBA. Widely but locally distributed and, at best, uncommon. Not recorded in N & CE Sulawesi. Present in Lore Lindu National Park.
Bibliography. Coates & Bishop (1997), Collar (2004a), Desfayes (1967), Hartert (1896), Meyer & Wiglesworth (1898), Stresemann & Heinrich (1940), Watling (1983a), White & Bruce (1986).

Genus *GEOMALIA* Stresemann, 1931

22. Geomalia
Geomalia heinrichi

French: Géomalie des Célèbes **German**: Celebesdrossel **Spanish**: Zorzal Terrestre de Célebes
Other common names: Celebes Mountain Thrush/Ground-thrush, Heinrich's Whistling-thrush

Taxonomy. *Geomalia heinrichi* Stresemann, 1931, Mount Latimodjong, 2800 m, Sulawesi.
Systematic position uncertain. Some authors treat this species within present family, whereas others place it in Timaliidae. Current placement extremely tentative. Shows certain turdine features, including lightly spotted underparts in juvenile plumage, rather confident terrestrial foraging behaviour and thrush-like posture; equally, other features (very short, rounded and curved wing, pale wingpanel, fluffy elongate feathers on side of rump and round thighs, and long rounded tail) all tend to suggest affinities to timaliid genus *Garrulax*. Race *matinangensis* poorly differentiated; species perhaps better treated as monotypic. Two subspecies recognized.
Subspecies and Distribution.
G. h. heinrichi Stresemann, 1931 – NC & SC Sulawesi.
G. h. matinangensis Stresemann, 1931 – N & SE Sulawesi.



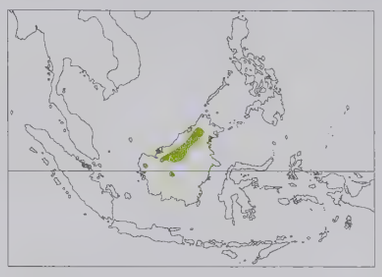
Descriptive notes. 28–30 cm. Distinctive species with long, graduated and slightly arched tail, distinctly short rounded wings, heavy bill, weak legs. Nominate race is dark brown to slate-grey above, with rusty-tinged wingpanel (paler outer vanes of primaries); face paler brown with vague small buff streaks; reddish-brown below, vague dark grey malar; bill blackish; legs brownish-grey. Sexes similar. Juvenile is shorter-billed and, initially, shorter-tailed than adult, plumage rusty buff below, extensive dark grey blotching on neck side, throat side and breast, thinning out on belly and flanks. Race *matinangensis* is slightly smaller than nominate, rather darker below and on crown and nape. Voice. Song or call a thin, slightly dry, high-pitched whistle lasting c. 1 second, repeated at 0·5-second intervals, given insistently but intermittently.
Habitat. Primary montane evergreen forest with dense undergrowth, moss-forest and dwarf forest, at 1700–3500 m.
Food and Feeding. Large coleopterans, beetle (elaterid) larvae and a small snail found in stomachs. Forages on ground, moving through undergrowth with agile timaliid-like hops and turdine-like pauses, the hops almost like those of a rat (Muridae); also along tracks in twilight.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sulawesi EBA. Currently considered Near-threatened. Generally scarce, apparently fairly common locally. Occurs in Lore Lindu National Park, where recent concern that the number of domestic cats present may be having an impact on this highly terrestrial species. Such impact likely to be replicated throughout its very limited range.
Bibliography. Coates & Bishop (1997), Collar (2004a), Holmes & Phillipps (1996), Stattersfield & Capper (2000), Stresemann (1931), Stresemann & Heinrich (1940), Watling (1983a).

Genus *CHLAMYDOCHAERA* Sharpe, 1887

23. Black-breasted Fruithunter
Chlamydochaera jefferyi

French: Chlamydochère de Bornéo **German**: Fruchtpicker **Spanish**: Zorzal de Borneo
Other common names: Fruithunter, Black-breasted Triller, Black-collared Thrush

Taxonomy. *Chlamydochaera jefferyi* Sharpe, 1887, Mount Kinabalu, north Borneo.
Formerly placed in family Oriolidae. Systematic position until relatively recently undecided, and more frequently placed in family Campephagidae; biomolecular and anatomical analyses, as well as nest structure, however, indicate that it belongs in present family. Monotypic.
Distribution. N, W & C Borneo, ranging from Gunung Kinabalu S to Gunung Mulu and Gunung Dulit, also Gunung Nyiut and Bukit Baka-Bukit Raya National Park.



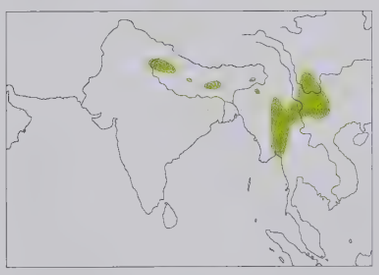
Descriptive notes. 22·5 cm. Male is medium grey above, pale grey on crown and underparts, with rusty-buff chin, throat, cheeks and forehead; black eyestripe extending from lores to nape, bold black clear-cut black breast patch; primaries and edges of tail black, outer tail tipped white; whitish wingbar (in flight); bill and legs black. Female has grey colours replaced with pale rusty brown, but paler rusty buff on crown, and shot with grey on wings and back, wingbar buffy. Juvenile is browner on back and speckled black on head to breast. Voice. Song unknown. Call by both sexes, perched but also in flight, a quiet, high, sometimes rising "seep", repeated at intervals of c. 10 seconds; male calls female from nest with barely audible high whistle.
Habitat. Tall lower montane forest and nearby gardens, at 700–3200 m.
Food and Feeding. Fruits, including *Litsea cubica*, orange drupes of small tree, large green berries and fruit that carry seeds 15 × 11 mm; in dry periods also animal matter, once mainly the introduced snail *Bradybaena similaris*. Male seen to feed laying female with large fig (*Ficus*) and other large fruits and small berries. Forages typically in middle storey, often in mixed flocks with e.g. bulbuls (Pycnonotidae); also on ground, probing beneath leaf litter, and breaking snails by tapping against tarmac, concrete, stones, branches or hard earth.
Breeding. Nest in Mar–Apr, breeding-condition birds in Mar, and dependent young in Aug–Sept. Only recorded nest was a deep cup of slender plant fibres with thick outer layer of green moss, placed 10 m up in fork of narrow branches of tall sapling. No other information.
Movements. Sedentary or nomadic. Individuals, often in pairs or small loose flocks, tend to appear in an area for a few days, only to disappear for months on end. An altitudinal migrant on Mt Kinabalu.
Status and Conservation. Not globally threatened. Restricted-range species: present in the Bornean Mountains EBA. Common on Gunung Dulit. Apparently patchily distributed in montane areas, but gaps in range may be artefacts of observer coverage. Recorded from Mount Kinabalu National Park and Bukit Baka-Bukit Raya National Park.
Bibliography. Ahlquist *et al.* (1984), Collar (2004a), Davison (1992), MacKinnon & Phillipps (1993), Parr *et al.* (2002), Rice (1989), Sheldon *et al.* (2001), Smythies (1999).

Genus *COCHOA* Hodgson, 1836

24. Purple Cochoa
Cochoa purpurea

French: Cochoa pourpré **German**: Purpurschnäpperdrossel **Spanish**: Cochoa Púrpura

Taxonomy. *Cochoa purpurea* Hodgson, 1836, Nepal.
Monotypic.
Distribution. Himalayas, NE India (Assam), N & E Myanmar, SC China, NW Thailand and N Vietnam (N Tonkin).



Descriptive notes. 25–28 cm; 100–106 g. Male is mainly deep greyish-purple, with silver-blue crown, black face; primaries with silvery-grey double patch and black intervening panel, black tips of all flight-feathers; tail lilac-grey with black terminal band; relatively short bill and legs black. Female is patterned as male, but body rufous-brown above, brownish-orange below. Juvenile has basic female pattern on crown, wings and tail, but body chocolate-brown with light rufous-buff flecking above, rufous-buff with heavy brown scaling below. Voice. Song a rich, mellow, low-sounding pure whistle, "fwhiiiiiiiit", initially slightly upslurred and softer, then level-pitched, ending abruptly; deeper and clearer than that of *C. viridis*. Calls include low nasal chuckling "nyerr", thin "sit" or "srii", and soft high "pink-pink trrrrrew".
Habitat. Dense humid and moist broadleaf evergreen forest, pine (*Pinus*) forest, humid undergrowth in ravines, but mostly in lower canopy and middle storey; 1000–3000 m, one record at 400 m in Thailand.
Food and Feeding. Berries, insects, molluscs. Feeds on ground and in fruiting trees.
Breeding. May–Jul in India. Nest a shallow cup placed 2–6 m above ground in fork of small tree. Eggs 2–4, pale sea-green with bright reddish-brown blotches over lavender-grey undermarkings. No other information.
Movements. In Himalayas apparently a summer visitor, May–Oct, or else strongly nomadic, but no evidence of winter whereabouts. Vagrants or migrants recorded in Bangladesh, including one on a golf course in Nov.
Status and Conservation. Not globally threatened. Scarce in Himalayas, although probably under-recorded owing to highly unobtrusive behaviour; at least formerly common in summer in Nagaland. Rare in China. Scarce throughout SE Asian range and judged rare in Myanmar and

On following page: 25. Green Cochoa (*Cochoa viridis*); 26. Sumatran Cochoa (*Cochoa beccarii*); 27. Javan Cochoa (*Cochoa azurea*).

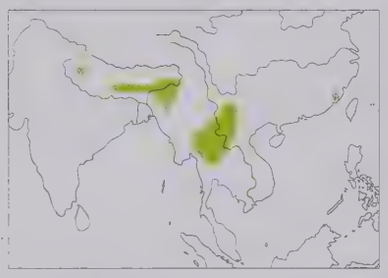
Thailand, but probably greatly overlooked. Nine individuals of this species offered for sale in local market in Laos (presumably collected elsewhere), suggesting that the species may be commoner than suspected, but also more vulnerable to exploitation.
Bibliography. Ali (1977), Ali & Ripley (1987b), Bishop (1999), Cheng Tsohsin (1987), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inglis (1934), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Zheng Guangmei & Zhang Cizu (2002).

25. Green Cochoa

Cochoa viridis

French: Cochoa vert **German**: Smaragdschnäpperdrossel **Spanish**: Cochoa Verde

Taxonomy. *Co.(choa) Viridis* Hodgson, 1836, Nepal.
Monotypic.
Distribution. E Himalayas and NE India (Assam), E Myanmar, S & E China (S Yunnan, Fujian), NW Thailand and NW Indochina.



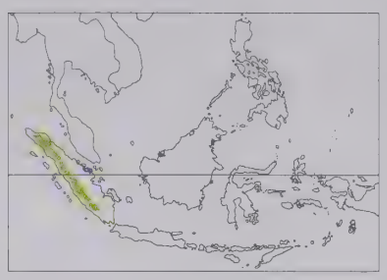
Descriptive notes. 25–28 cm; male 88–99 g, female 117–122 g. Male is mainly mossy green, with shiny mid-blue crown and nape, slightly darker blue face; bluish towards centre of underparts, especially on throat and belly; broad silvery-blue wingpanels offset by black bars and tips; deeper silvery-blue tail with broad black terminal band; bill black and legs pinkish, both rather short. Female is like male, but with more bronzy-green body, bronzy-green staining on wingpanels. Juvenile has wing pattern similar to adult, but heavily white-barred blackish crown, brownish body with heavy rufous-buff flecking above, heavy scaling below. VOICE. Song, from perch in upper middle storey, a very thin, even, pure monotone whistle, "fiiiiiiii", slightly fading, lasting 2 seconds and given every few seconds, longer, higher, more metallic and more even than that of *C. purpurea*. Calls include harsh note and very high, short, thin "pok".
Habitat. Dense moist broadleaf evergreen forest, often near small streams, at 700–1800 m; in various strata, including undergrowth, but mainly in canopy and middle storey. In Laos recorded from variety of habitats, including dry evergreen forest (in one case a fragment), tall forest in valleys in limestone areas, and stunted ridgetop forest.
Food and Feeding. Berries, insects and molluscs recorded. Forages, often in pairs or small flocks, in trees and undergrowth, occasionally on ground. Once seen to sally-hawk for insects from treetop.
Breeding. May–Jul in Himalayas and Apr–Jun in SE Asia. Nest a shallow cup placed up to 10 m above ground in fork of small tree, often near water. Eggs 2–4, similar to those of *C. purpurea*. No other information.
Movements. Summer breeding visitor in Himalayas Mar–Aug, or strongly nomadic; seemingly absent during Dec–Feb, but non-breeding grounds unknown. Apparently resident elsewhere in range.
Status and Conservation. Not globally threatened. Rare or, at least, rarely seen owing to highly unobtrusive behaviour; at least formerly rather common in E Manipur (NE India). Originally described from Nepal, but no records since c. 1830s. Scarce throughout SE Asian range, and judged rare in Myanmar and uncommon in Thailand, but probably greatly overlooked. In Laos, frequency with which calls heard indicate that it is relatively common, e.g. in Nadi limestone area and Bolaven Plateau; deforestation in the country is rapid, however, and even so elusive a species has been found on sale in food markets and its feathers kept as trophies; harvesting pressure may affect the species seriously when forest becomes more fragmented.
Bibliography. Ali (1977), Ali & Ripley (1987b), Bishop (1999), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Hopwood (1906), del Hoyo & Carrera (1989), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Thewlis *et al.* (1998).

26. Sumatran Cochoa

Cochoa beccarii

French: Cochoa de Sumatra **German**: Sumatraschnäpperdrossel **Spanish**: Cochoa de Sumatra

Taxonomy. *Cochoa beccarii* Salvadori, 1879, Padang highlands, Sumatra.
Has been thought to form a superspecies with *C. azurea*, and has often been considered conspecific, but significant differences in size and plumage. Monotypic.
Distribution. Mountains of Sumatra.
Descriptive notes. 28 cm. Male looks like a cross between *C. purpurea* and *C. viridis*: velvety (yet slightly glossy) black, with dull powder-blue forehead and crown; extensive pale wing patch formed by glaucous-blue colour on outer webs of greater upperwing-coverts, of secondaries and tertials, and of primary bases, wing-coverts with black tips (wingbar); tail with duller glaucous-blue on central feathers and outer webs of outer feathers (outermost black), with black terminal bar; iris hazel, red eyering; bill black; legs grey. Female is similar to male, but body plumage dark brown, ginger-buff throat and face, small white area on chin, blue wing patches slightly paler, legs pale



flesh. Juvenile undescribed. VOICE. Song or call a long, thin, high mournful whistle. Calls include "sip" in flight, similar to that of *Zoothera sibirica*.
Habitat. All storeys of tropical lower montane forest, at 1000–2200 m.
Food and Feeding. Small fruits, including green berries in bushes 5–10 m off ground. Possibly forages also on ground, for invertebrates or fallen fruit. Pair also seen in mixed-species foraging party.
Breeding. Suspected brood-feeding by pair in Feb, and juvenile and immatures observed in May–Jun; song heard daily in Jun, and season probably extended but with main focus in first half of year. No other information.
Movements. Apparently sedentary; possibly some local seasonal or elevational movements.
Status and Conservation. VULNERABLE. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Estimated global population in range 2500–10,000 mature individuals, and considered to be declining owing to relentless habitat loss at lower end of its elevational range. In recent review seven localities mapped, of which five known to involve post-1980 records. Appears to occur at very low densities, but is highly unobtrusive, and may be commoner than the few records suggest. At least a third of montane rainforest in Sumatra destroyed as a result of logging and agricultural encroachment. All known localities are in areas with high human pressure for farmland. Recorded from Kerinci-Seblat National Park, from which there are recent records. On Gunung Singgalang little suitable habitat remains. Fresh surveys needed, along with new protected areas for key sites, and a conservation-awareness campaign at such sites.
Bibliography. Borgstein (2000), Collar & Andrew (1987), Collar *et al.* (2001), Holmes (1996), Johnson & Stattersfield (1990), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Robinson & Kloss (1918), Salvadori (1879), Simpson (1995), Stattersfield & Capper (2000).

27. Javan Cochoa

Cochoa azurea

French: Cochoa azuré **German**: Sundaschnäpperdrossel **Spanish**: Cochoa de Java
Other common names: Black-and-blue Cochoa, Malaysian Cochoa

Taxonomy. *Turdus azureus* Temminck, 1824, Java.
Possibly more appropriately placed in a monotypic genus on account of its smaller size and different pattern compared with current congeners. Has been thought to form a superspecies with *C. beccarii*, and has often been considered conspecific, but differs significantly in size and plumage. Monotypic.
Distribution. W & C Java.



Descriptive notes. 23 cm. Male is shiny dark blue above, with paler shiny blue crown and edges of greater upperwing-coverts and flight-feathers; deep purplish-blue below; iris dark; bill and legs black. Female is dark brown, with blue on crown, wings and tail. Juvenile is like female, but breast spotted buff-brown. VOICE. Song, delivered in one instance from perch only 4 m off ground, a thin high whistle, "siiiit". Calls include scolding "cet-cet-cet" in alarm.
Habitat. Lower and upper tropical montane rainforest, at 900–3000 m. "Normal" use of lower and middle storeys and occasional use of canopy reported, but habit of perching quietly for long periods makes it undetectable in upper storeys; proportionate use of forest structure therefore not reliably known.
Food and Feeding. Fruits and berries, including *Zanthoxylum ovalifolium* and *Z. scandens*; also insects and snails. Captive individual took live insect larvae and pupae, but ignored a variety of fruits. Uses serrated bill to tear flesh from fruits in canopy. Once seen in mixed-species foraging flock in middle canopy.
Breeding. Aug–Apr; nest with grown nestling in Sept, eggs in Dec and dependent nestling in Apr. Only nest described was a cup typical of family, but core made almost entirely of beard moss and interior lined with beard moss and fine rootlets, placed 7 m off ground in moss-forest at 2400 m. Eggs 2. No other information.
Movements. Apparently sedentary; possibly some local seasonal or elevational movements.
Status and Conservation. VULNERABLE. Restricted-range species: present in Java and Bali Forests EBA. Estimated global population in range 2500–10,000 mature individuals; considered to be declining owing to steady habitat loss (agricultural encroachment and localized development) at lower end of its elevational range. In recent review eleven localities mapped, of which only three known to involve post-1980 records. Appears to occur at very low densities, but is highly unobtrusive and may therefore be commoner than evidence suggests. Present in Gunung Gede-Pangrango and Gunung Halimun National Parks, which jointly cover over 500 km² of forest; possibly also in Gunung Tangkuban Prahu Nature Reserve, from which area there are historical records. A proposed nature reserve at Gunung Slamet, a historical site, deserves implementation. Small numbers have appeared in the bird trade; monitoring of situation required.
Bibliography. Andrew (1985), Bartels (1902, 1906), Becking (1989), Borgstein (2000), Collar & Andrew (1987), Collar *et al.* (2001), Hellebrekers & Hoogerwerf (1967), Hoogerwerf (1948, 1950), Johnson & Stattersfield (1990), MacKinnon (1988), MacKinnon & Phillipps (1993), Stattersfield & Capper (2000).

PLATE 52 ➤



PLATE 52

inches 5

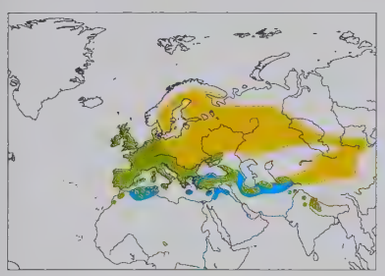
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Genus *TURDUS* Linnaeus, 1758

28. Mistle Thrush
Turdus viscivorus

French: Grive draine **German**: Misteldrossel **Spanish**: Zorzal Charlo

Taxonomy. *Turdus viscivorus* Linnaeus, 1758, Essex, England.
Three subspecies recognized.
Subspecies and Distribution.
T. v. viscivorus Linnaeus, 1758 – Europe E to W Siberia and N Iran; non-breeding also N Africa and SW Asia.
T. v. deichleri Erlanger, 1897 – NW Africa, Corsica and Sardinia.
T. v. bonapartei Cabanis, 1860 – Turkmenistan and SC Siberia S to W Nepal and Altai; non-breeding C & S Asia.



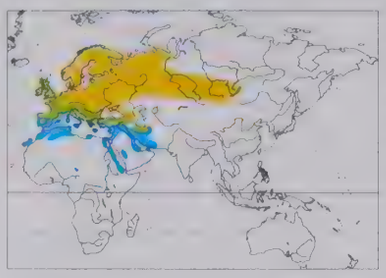
Descriptive notes. 27–28 cm; 93–167 g. Large, long-tailed, rather pale thrush. Nominate race is brownish-grey above, with buffy-olive rump, narrow whitish wingbars and greyish flight-feathers, tail with white distal outer feathers and tips; whitish below, with darker vertical smudge below eye and on rear ear-coverts, extensive but often rather sparse black spotting and sometimes a darkish patch at breast side; underwing-coverts white; bill dark, yellowish base; legs pinkish-flesh. Sexes similar. Juvenile is like adult, but buff-streaked from nape to scapulars, finer spotting below. Race *deichleri* is paler than nominate; *bonapartei* is paler and larger. VOICE. Song, by male from treetop, at times in flight (relatively common in open park-like landscapes), a series of short, loud, rich and mellow yet also slightly flat, monotonous and tuneless phrases, moderately varying and separated by distinct pauses, "truitruvu... churichuru... chuvutru... churuvutru..."; often sings at unusual times, as in poor weather, but typically at dawn and dusk. Rarely mimics other species. Subsong, given in sexual and aggressive encounters, a quiet, harsh, rambling warbling. Calls include distinctive loud rattling "zer'r'r'r'r", given in alarm and aggression and for contact, frequently in flight; also squeaky staccato "tuc" or "kewk", like call of Common Coot (*Fulica atra*), often repeated, for contact between members of pair and family.
Habitat. Mosaic of wooded and open country, thus open mature forest, woodland glades, orchards, riverside forest, open grassland with scrub, mountain steppe with shrubs, often penetrating grassy–bracken moorland areas on low craggy hills and mountains at some distance from trees (and sometimes breeding in such habitat on small islands around Britain); most typically, in rolling, open landscapes with scattered trees or copses, including parkland and park-like farmland; densities greater in hilly country than in flat; in Europe breeds from sea-level to 1800 m. In N Africa prefers juniper (*Juniperus*), oak (*Quercus*), pine (*Pinus*) and cedar (*Cedrus*) forests above 600 m, mainly 1500–2700 m, but also gardens, fields and semi-arid open woodland and palm groves, often near water. In Turkey open coniferous or mixed forest, plantations, gardens and orchards, mainly 800–2600 m. In W Himalayas breeds in drier inner mountain ranges in open conifer forest including deodar (*Cedrus deodara*) and dwarf juniper (*J. macropoda*), sometimes with birch (*Betula*) or oak, rocky tree-studded short-grass areas, dwarf-juniper scrub and orchards, at 1800–3800 m, wintering in similar habitat, hilly fields, grassy hillsides and forest edge at 1200–3000 m. In parts of range, distribution and availability of mistletoe (*Viscum album*) a strong determinant of winter habitat occupancy. In non-breeding season in Israel, found in open areas of mixed light woodland and maquis, orchards and adjacent fields, chiefly in hilly areas.
Food and Feeding. Invertebrates and, in autumn and winter, seeds and fruits. Animal food includes adult and larval beetles (Coleoptera) of at least ten families, adult and larval craneflies (Tipulidae), adult and mostly larval lepidopterans, orthopterans (crickets, grasshoppers), earwigs (Dermaptera), bugs (Hemiptera), spiders, millipedes (Diplopoda), snails, slugs, earthworms; rarely, small vertebrates, including nestling birds. Plant food includes mainly fruits and/or seeds of barberry (*Berberis*), dogwood (*Cornus*), hawthorn (*Crataegus*), strawberry (*Fragaria*), alder buckthorn (*Frangula*), ivy (*Hedera*), holly (*Ilex*), juniper, apple (*Malus*), olive (*Olea*), Virginia creeper (*Parthenocissus*), cherries (*Prunus*), pear (*Pyrus*), buckthorn (*Rhamnus*), currant (*Ribes*), rose (*Rosa*), bramble (*Rubus*), elder (*Sambucus*), knawel (*Scleranthus*), rowan (*Sorbus*), snowberry (*Symphoricarpos*), yew (*Taxus*), bilberry (*Vaccinium*), viburnum (*Viburnum*), *Viscum* and *Loranthus* mistletoes, and vine (*Vitis*), also grass shoots, sycamore (*Acer*) flowers, moss and fungus. Stomachs of 52 birds from all year, Britain, contained 55% invertebrates (36% insects, of which majority adult and larval beetles, 14% earthworms, 3·5% slugs and 1·5% others), 45% vegetable matter (24% wild fruit and seeds, 16·5% cultivated fruit, 4·5% other); among fruit consumed in three areas in S Britain, 44% were yew, 25% holly, 18% hawthorn, 10% ivy and 3% bilberry. Six stomachs from Armenia (span over year unknown) held weevils, chafers, *Blaps*, larval ground beetles, dung beetles, molluscs, Russian olive (*Elaeagnus angustifolia*) and sea buckthorn (*Hippophae rhamnoides*). In one all-year study in Spain, invertebrate prey was always arthropods and significant only Apr–Jul, otherwise great variety of fruits of plants in undergrowth and woodland gaps. In autumn–winter study in Spain, 68 stomachs held vegetable matter (71% biomass), mostly olives, grapes, hawthorn and Rosaceae, and animal matter (29%), of which two-thirds were beetles. In Morocco in December, four stomachs held caterpillars, beetles, grasshoppers and berries, with one full of holly berries. In Pakistan in winter, seen to consume dwarf mistletoe (*Arceuthobium oxycedri*), a locally serious parasite of dwarf juniper. Food brought to nestlings, based on 16 stomachs, Britain, was invertebrates, mostly soft-bodied and chiefly adult and larval flies, beetles (mostly larvae), earthworms, slugs and caterpillars; in Pakistan, delivered large melolonthid and tipulid grubs, small worms and slugs to nestlings. Forages on ground in open or under semi-open canopy, or in trees for fruit; may defend particular fruiting tree through winter against other thrush species in order to assure long-term (slowly depleting) food resource, but in cold snaps large numbers of other thrushes can overwhelm defender. Sometimes sallies after flying insects, and to snatch fruit from ends of twigs.
Breeding. Late Mar to late Jun in W & C Europe, and from late Apr at earliest in N (Finland); late Mar to Jul in Afghanistan E to W Himalayas; Mar–Jun in NW Africa; often double-brooded, including in Morocco in favourable years, and probably W Himalayas. Solitary, but occasionally (apparently unusually) loosely colonial; in one study in Denmark 64% pairs solitary, 36% colonial with 2–7 (average 3·2) pairs per colony, nests sometimes very close. Strongly territorial, nest territory generally fairly small, e.g. 0·6 ha in wooded parkland, but pair forages over much larger area, once 15–17 ha, in another instance seen to fly more than 1 km from nest to feed. Nest a large cup of dry grass, plant stems, roots and moss, bound together with mud, lined with fine grasses and sometimes pine needles, usually 2–10 m up in fork of tree, in Morocco e.g. *Cedrus atlantica*, aleppo pine (*Pinus halepensis*), holm oak (*Q. ilex*) and juniper, in Pakistan *Pinus wallichiana*, *Juniperus macropoda* and fruit trees; earlier nests in Britain more often in conifer than are later ones; 22 nests in Poland 1–21 m (average 9·5 m) above ground; close proximity of some nests to those of Chaffinch (*Fringilla coelebs*) thought to be of mutual benefit, combining vigilance of finch with aggression of thrush. Eggs 3–5, sometimes 2, pale blue to bluish-green with reddish-brown and purplish spots; incubation period 12–15 days; nestling period 14–16 days; young capable of flight at 20 days; post-fledging dependence 15–20 days, male taking responsibility for young when second clutch laid. In Britain, 40% of 435 nests produced at least one independent young. Annual mortality 48%, with mortality of first-year birds 62%; causes of mortality of ringed individuals in NW Europe are natural predator 11%, domestic predator 19%, human-related (accidental) 43%, other 27%. Ringed adult survived 9·5 years; another was at least 21 years 4 months.
Movements. Largely sedentary or partial migrant in W of range, roughly from Germany S to Balkans, Turkey and Armenia; in E & NE of range appears more fully migratory, but data scant. Tends to migrate in small loose aggregations. In Europe N populations tend to be more migratory than S ones; populations in Scandinavia and C Europe tend to move SW, wintering in NW & W Europe from Belgium and W France S to NE Spain. In Britain great majority sedentary (although often nomadic and far-ranging in winter), but small number of offspring and non-breeders may move SW into Ireland and France during late summer and autumn (roving flocks form as early as Jul, with longer-distance movements Aug–Nov); immigrants arrive Ireland Sept-Nov. Race *deichleri* largely sedentary, but some post-breeding descent, mainly to 1200–1700 m, in Morocco, while nominate is winter visitor Oct–Mar in variable numbers in Morocco E to Egypt and on Mediterranean islands. Mainly winter visitor to Israel, mostly Dec to mid-Mar, some passing on farther S; often fairly common, sometimes absent or rare. Situation in E parts of range extremely poorly known, with few or no data on schedules; considered a partial migrant in C Russia and W Siberia, some moving S to S Kazakhstan and Tadjikistan. Apparently absent N Afghanistan Nov–Mar. In W Himalayas undertakes minor altitudinal movements to lower valleys and adjacent plains in winter. Spring return in W Europe relatively early, first individuals reaching C Europe in Feb, and arriving in C Sweden in last week Mar. Males apparently precede females by c. 8 days.
Status and Conservation. Not globally threatened. Common in most of range; fairly scarce in Afghanistan; uncommon to frequent resident in NW Africa; locally common in W Himalayas. Densities in hilly country typically 30 pairs/km² (Switzerland above 700 m), but in European lowlands including Britain 5–10 pairs/km²; in Morocco density 5·2 pairs/km² (= 1 pair/19 ha). Total population in Europe in mid-1990s estimated at 2,221,106–3,142,991 pairs, with additional 10,000–100,000 pairs in Russia and 5000–50,000 pairs in Turkey; at that time Spain estimated to hold 330,000–790,000 pairs, but recently minimum population calculated at 82,178 pairs (only potential problem there is hunting). By 2000, total European population (including European Russia and Turkey) revised to 3,000,000–7,400,000 pairs and considered generally stable. Major range and population expansion in Europe in 19th century, when species colonized many lowland woodland areas from forest on mountain slopes and hanging valleys. Rare in N Britain at end of 18th century and unrecorded as breeder in Ireland before 1807, with steady colonization through 19th century; similar spread through Netherlands 1870–1920. Situation in Europe currently fairly stable, but declines recorded since 1985 in Estonia, Ukraine, Italy and N Finland, attributable in Finland, at least, to felling of old-growth forest.
Bibliography. Adamian & Klem (1997, 1999), Ali & Ripley (1987b), Andrews (1995), Anon. (2004e), Aparicio (2003b), Bates & Lowther (1952), Baumgart *et al.* (1995), Beaman & Madge (1998), Cheng Tsohsin (1987), Clark (1983), Clement & Hathway (2000), Cramp (1988), Dementiev *et al.* (1968), Dunn (1994), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Glutz von Blotzheim & Bauer (1988), Goodman & Meininger (1989), Green (1998), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Hardy (1969), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Ince & Slater (1985), Inskipp & Inskipp (1991), Isenmann & Moali (2000), Kasparek (1992), Kestenholz (2001), Kovshar & Gavrilov (1973), Ledant *et al.* (1981), MacKinnon & Phillipps (2000), Marples (1937), Meyer de Schauensee (1984), Nightingale & Hill (1993), Obeso (1986), O'Halloran (2002), Paludan (1959), Paz (1987), Peitzmeier (1949), Pérez-González & Soler (1990), Porter *et al.* (1996), Raevel (1981), Rasmussen & Anderton (2005), Roberts (1992), Roselaar (1995), Scharlemann (2003), Shirihai (1996), Simms (1978), Slotta-Bachmayr & Winding (1994), Snow, B.K. & Snow (1984), Snow, D.W. (1969), Thévenot *et al.* (2003), Thiede (1995), Urban *et al.* (1997), Vaurie (1955c), Wheatley (1986).

29. Song Thrush
Turdus philomelos

French: Grive musicienne **German**: Singdrossel **Spanish**: Zorzal Común

Taxonomy. *Turdus philomelos* C. L. Brehm, 1831, central Germany.
Earlier name *T. ericetorum* invalid. May form a superspecies with *T. mupinensis*. Race *nataliae* very similar to nominate and perhaps better merged with it. Races intergrade. Four subspecies recognized.
Subspecies and Distribution.
T. p. hebridensis W. E. Clarke, 1913 – W Scotland (Outer Hebrides, I of Skye, W mainland coast) and W Ireland.
T. p. clarkei Hartert, 1909 – W Europe; non-breeding also SW Europe and NW Africa.
T. p. philomelos C. L. Brehm, 1831 – Europe (except W), N Turkey, Caucasus area and N Iran; non-breeding W & S Europe, N Africa, Arabian Peninsula and SW Asia.
T. p. nataliae Buturlin, 1929 – W & C Siberia; non-breeding NE Africa and SW Asia.
Introduced (nominate race) SE Australia and New Zealand.
Descriptive notes. 20–23 cm; 50–107 g. Nominate race is plain brown above, slightly more olive-tinged on rump, weak buff spotting on wing-coverts, vague dark auricular bar and buff-streaked cheeks; plain buffy-white submoustachial streak and chin divided by dark malar; whitish below with buff tinges, especially across breast and on flanks, with rather regular dark spotting from breast to belly and flanks; yellowish-buff underwing-coverts; bill dark, paler base; legs

On following pages: 30. Chinese Thrush (*Turdus mupinensis*); 31. Redwing (*Turdus iliacus*); 32. Fieldfare (*Turdus pilaris*); 33. Naumann's Thrush (*Turdus naumanni*); 34. Dusky Thrush (*Turdus eunomus*); 35. Rufous-throated Thrush (*Turdus ruficollis*); 36. Black-throated Thrush (*Turdus atrogularis*); 37. Japanese Thrush (*Turdus cardis*).



pinkish. Differs from similar *T. mupinensis* mainly in plainer face, smaller spots below. Sexes similar. Juvenile is like adult, but buffier on head, buff-streaked on mantle and scapulars. Race *hebridensis* is darker brown above than nominate, with rump greyish-tinged, less extensive buff and larger spots below, underwing-coverts more orangey; *clarkei* is intermediate between previous and nominate; *nataliae* is very slightly larger and paler, rump more uniform with upperparts. Voice. Song, by male, commonly (but not only) in relatively deep twilight, a very loud, vigorous, long-sustained series of short, fairly rapidly delivered phrases, each generally repeated 2–3 times, and each consisting of several strong, well-enunciated, richly whistled notes, varying in pitch (but higher and shriller than *T. merula*), emphasis and length (mostly all very short), e.g. "quitquitquitquit... quitquitquitquit... dudulidlít dudulidlít... codídio... codídido... filip filip filip filip... terrrrt terrrrt terrrrt... pichipíchi pichipíchi..."; song louder and more intense during counter-singing with rival male; song output over year has distinct phases, including extended one at end of breeding, possibly for repertoire-learning by offspring or territorial marking for subsequent season. Subsong, commonly by interacting males, a low twittering warble, and similar type of song given in courtship of female. Calls include anxious "tsipp" in short flight (often when flushed), high thin "siih" as warning of aerial predator, dry staccato "stuk-stuk-stuk" in mild excitement, and excited explosive chattering "tikikikikikik" in high alarm or anger (in breeding season); metallic "zilip" heard from spring migrants in S Caspian region.

Habitat. Breeds in almost all types of temperate forest and woodland, generally in lowlands and valleys but reaching tree-line in Switzerland (1600–2200 m) and Russia (1200 m), and found mainly at 500–1900 m in Turkey; key features of habitat are patches of trees and bushes with small areas of open moist ground (grassland or litter-rich soil) supporting abundant invertebrate fauna. Nominate race favours spruce (*Picea*) forest, while *clarkei* and *hebridensis* occupy deciduous forests and even fairly open, seemingly marginal habitats such as heath-covered inshore islands and sparse hillside birch (*Betula*) woods (Scotland) and scrubby steppe (Armenia). In natural beech (*Fagus sylvatica*) area of 213 ha in Switzerland, 79 (81%) of 98 territories were in spruce patches although spruce covered only 16% of area. Original occupation of old forests, both deciduous and coniferous, perhaps borne out by findings of studies in farmed landscape in E Britain, where race *clarkei* uses gardens (71·5% of territories in 2% of total area) and woodland (22·7% in 1% of total area) but has poor breeding success in farmland itself; declines and losses far greater in gardens and small woods (20–30% extinction rates) than in large woods, implying that latter, despite holding lower densities than gardens, may be optimal. Has nonetheless adapted well to modern lowland agricultural and urban landscapes, breeding in small woodlots, parkland, orchards, mature hedgerows, overgrown railway embankments, roadsides, cemeteries, and suburban gardens with some tall trees. Non-breeding areas somewhat drier in S of range, and in Morocco winters mainly in low and tall scrub and trees, also orchards and vineyards, euphorbia, *Argon* bush, *Salicornia*, *Ilex* woods, and forests at up to 2700 m, in Tunisia in deciduous forest and olive groves, in Israel mainly in areas with mixed trees and thickets in natural and agricultural land, gardens, orchards and woodland, in Sudan in arid open bush to 1050 m, in Eritrea in acacia (*Acacia*) bush along coast, sometimes in high moorland, in Saudi Arabia in palm groves and on waste land, and in United Arab Emirates in large gardens, fields, palm groves, irrigated light woodland and parks.

Food and Feeding. Invertebrates and berries. Animal food in W Palearctic includes adult and larval beetles (Coleoptera) of at least 15 families, adult and larval flies (Diptera) of at least six families, adult and larval lepidopterans of at least six families, adult and larval neuropterans of at least three families, bugs (Hemiptera) of at least six families, orthopterans (crickets, bush-crickets, grasshoppers), hymenopterans (ants, sawflies and ichneumons), scorpion flies (Mecoptera), earwigs (Dermaptera), spiders, harvestmen (Opiliones), mites (Acarina), woodlice (Isopoda), sandhoppers (Amphipoda), millipedes (Diplopoda), centipedes (Chilopoda), snails, slugs and earthworms; very rare reports of vertebrates, i.e. lizard, slow-worm (*Anguis*) and shrew (Soricidae), taken or attacked. Plant food mainly fruits and seeds of barberry (*Berberis*), dogwood (*Cornus*), cotoneaster (*Cotoneaster*), crowberry (*Empetrum*), spindle (*Euonymus*), strawberry (*Fragaria*), ivy (*Hedera*), sea buckthorn (*Hippophae*), juniper (*Juniper*), honeysuckle (*Lonicera*), olive (*Olea*), cherries (*Prunus*), currant (*Ribes*), bramble (*Rubus*), elder (*Sambucus*), rowan (*Sorbus*), yew (*Taxus*), bilberry (*Vaccinium*), viburnum (*Viburnum*), mistletoe (*Viscum*), vine (*Vitis*), also spruce needles, clover (*Trifolium*) and turnip. Stomachs of 84 birds from throughout year, Britain, held 35·5% insects (largely adult and larval beetles), 15% earthworms, 5% slugs and snails, 1·5% other invertebrates, 41·5% fruits and seeds, and 1·5% grass, bread and other items. In suburban S Britain, Dec–Mar, earthworms constitute up to 94% of feeding records. Stomachs of 244 spring migrants from Heligoland (Germany) held 890 invertebrates, of which 35% by number snails, 28% adult insects (mostly beetles), 16% larval insects (mostly beetles and flies), 10% slugs, 9% earthworms and 2% others, 13% of stomachs also containing plant matter. Summer diet in Britain dominated by earthworms, snails, beetles and insect larvae (mainly Coleoptera and Lepidoptera), earthworms predominating Mar–Apr and snails Jun–Jul, and spiders becoming important in late summer; snails can also predominate in Jul–Sept, fruit becoming important Sept–Nov. In autumn and winter, SW France, 64% of stomachs held fruit, with juniper berries in 45%. In winter in Córdoba (Spain), stomachs of 130 birds held 69–82% (monthy averages by volume) fruit and seeds, notably (41–60%) olives, but snails important in some areas; in 155 stomachs from NE Spain and Mallorca 15 species of shelled snail identified (no slugs recorded), in Israel (Negev) large numbers of snails taken, and in Egypt desert snails (*Eremina desertorum*) recorded. Food brought to nestlings generally softer-bodied than summer adult diet; stomachs of 38 nestlings in Britain held 42 caterpillars, 9 maggots, 5 elaterid beetle larvae, 4 spiders, and remains of earthworms and slugs. Tends to forage more under bushes and trees, less in open, than do many congeners. Feeds close to cover on ground. Uses stones and other hard surfaces to smash snail shells; shelled snails smaller than 1 cm swallowed whole.

Breeding. Mainly mid-Mar to mid-Aug in W Europe, starting a month later in C & N Europe; 2–3 broods in C & S of range; introduced population in New Zealand breeds end Jun to Dec. Territory size variable with habitat, as little as 0·2 ha but generally 0·4–0·6 ha in suburban mature gardens but 1·5–6 ha in woodland in Finland and France. Nest a neat cup of grass, twigs and moss, thick hard lining of clay, mud, dung or rotten wood, often mixed with leaves, placed in bush, shrub or tree, often against trunk, also in creeper on wall, in bank or on ledge; more often on ground in summer than in spring; typical nest in Switzerland placed in Norway spruce (*Picea abies*), on average 2·9 m up in tree 7·4 m high; in Poland, mean height of 196 nests 2·5 m, range 0–8 m. Eggs 3–5, greenish-blue with blackish-brown spots; incubation period 10–17 days, mean 13·5 days; nestling period 11–17 days, mean 13 days; post-fledging dependence variable but generally short, 1–3 weeks, partly dependent on whether further nesting attempt made. In Swiss study, clutch loss 37% and nestling loss 33%; in Britain, hatching rate in one study 71% (739 eggs), fledging rate 78% (1034 nestlings) and overall success 55%, in another (involving 816 nests) 50% hatched and 36% fledged at least some young; failure rate during incubation generally increases significantly where corvids more abundant. Mortality in first year of life 53%, in second year 40%; annual overall mortality in Finland 54%; survival of first-years negatively correlated with duration of frost, adult survival negatively correlated with duration of summer drought; causes of mortality of ringed individuals in NW Europe are domestic predator 26%, human-related (accidental) 45%, human-related (deliberate) 12%, other 17%. Oldest recorded individual 13 years 9 months.

Movements. Mainly migratory; populations in W & S of breeding range sedentary, partial migrants or short-distance movers over winter period (in Britain, 50% of adults and 67% of first-years move). Breeders in Scandinavia, Germany and Switzerland migrate generally SW into Iberia and W Mediterranean; those at highest latitudes (and especially first-years) move farthest, to winter in broad band across N Africa (similarly, migrants from N Britain found farther S in Iberia than are those from S Britain); passage from late Aug and continuing Sept–Nov; present in Morocco Sept-May, with most passage mid-Oct to late Nov and Feb to end Mar. Populations from EC Europe take more SE direction, wintering from Italy E to Cyprus, and those in European Russia and Siberia winter in NE Africa, Middle East and Iran. Siberian birds migrate from mid-Sept, more S populations (in C Asia) remaining into Nov. Very common passage migrant and winter visitor in Israel, autumn peak Nov and spring peak first half Mar; passage and wintering in Jordan early Nov to early Apr. Commonest migrant thrush in Bahrain and United Arab Emirates Nov–Mar, with similar dates in coastal zone of E Saudi Arabia. Winter visitors occupy Red Sea coast of Sudan Oct–Mar, Eritrea late Nov to late Mar and Djibouti Dec–Mar; scattered records in Sahelian countries, and one from as far S as N Central African Republic. Leaves N Africa late Mar to early Apr, but individuals appear relatively site-faithful and route-faithful, so schedules probably different for different breeding populations (and/or for different cohorts and sexes within them); certainly, spring migration in France exhibits two peaks, in early and late Mar. Movement through NW Europe Mar to mid-May, arrivals in N of range from Scandinavia to Siberia from mid-Apr into May. No information on schedule of movements in SW Asia; winter vagrant in Pakistan and India.

Status and Conservation. Not globally threatened. Generally common to fairly common; uncommon in Armenia. Total population in Europe in mid-1990s estimated at 14,127,336–18,470,086 pairs, with additional 100,000–1,000,000 pairs in Russia and 10,000–100,000 pairs in Turkey; Spain estimated then to hold 200,000–400,000 pairs, but more recently minimum population there calculated as 101,134 pairs (only possible problem judged to be hunting). By 2000, total European population (including European Russia and Turkey) revised to 20,000,000–36,000,000 pairs and considered generally stable. In 20th century range expanded N in Scandinavia, and species colonized many urban parks and suburban gardens, but population in Britain declined by 7% per year in 1975–1986, and concomitant declines in Ireland and parts of C Europe. Decline in Britain now of serious conservation concern; causes not understood, but populations in garden habitats may have been underestimated in recent censuses. Changes in agricultural practices have probably caused major reduction in availability of key summer food resources on lowland farmland: loss of hedgerows, scrub and permanent grassland with livestock, and wide-scale installation of under-field drainage systems (resulting in early soil drying and hence loss of topsoil earthworms), have probably all contributed to decline in UK arable farmland, while pesticides and predators are further suspects. Role of disturbance unclear; appears to inhibit colonization of parks, and may therefore have negative influence on breeding success. Hunting pressure considerable for many decades in Mediterranean, but no clear evidence for decline. Densities reach exceptional 1·5–3·4 pairs/ha (150–340 pairs/km²) in some anthropogenic habitats in W Europe, but normally 0·1–0·5 pairs/ha (10–50 pairs/km²), with e.g. 27 and 43 pairs/km² in two oak woodlands in S England, 40 pairs/km² in spruce forest but only 10 and 5 pairs/km² in broadleaf woodland and pine (*Pinus*) forest, respectively, in Finland. In winter, common to abundant in N Africa; in Morocco the most regular and abundant winter thrush and one of commonest migrants in N woodlands. Uncommon in C Saudi Arabia. Introduced populations in Australia and New Zealand stem from late 19th century, but little outward spread from Melbourne (Australia); populations on Lord Howe I and Norfolk Is appear to be self-introduced from New Zealand, as are those on Macquarie I; also well established on some of Kermadec Is.

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30. Chinese Thrush

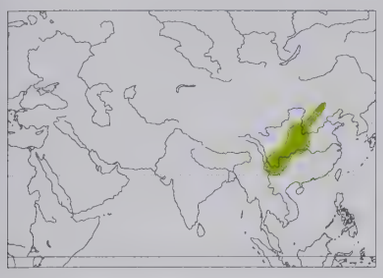
Turdus mupinensis

French: Grive de Verreaux **German**: Chinasingdrossel **Spanish**: Zorzal Chino
Other common names: Mongolian Thrush, Eastern/Verreaux's Song-thrush

Taxonomy. *Turdus mupinensis* Laubmann, 1920, mountains of Chinese Tibet = Mupin, Sichuan. May form a superspecies with *T. philomelos*. Monotypic.

Distribution. EC & S China from Hebei and SW Gansu S to Yunnan.

Descriptive notes. 23 cm. Has light grey-brown crown and upperparts, head with blackish vertical stripe below eye and another on rear ear-coverts, blackish malar stripe; upperwing-coverts with prominent large pale tips; whitish throat; white with buff tinges below, heavy large black spots from breast to belly and flanks; bill dark, paler base; legs pinkish. Distinguished from very similar *T. philomelos* by stronger facial pattern, more prominent wing-covert spots, much heavier spotting below. Sexes similar. Juvenile is more buffish on head, with buff streaking from nape to scapulars. Voice. Song a measured series of pleasant well-spaced phrases of 3–5 fairly evenly



pitched notes, e.g. "drrip-dii-du dudu-du-twi dju-wi-wi chu-wii-wr'up chu-wi'i-wu-wrrh dju-dju-wiii'u...". Calls seemingly unreported.

Habitat. Mixed broadleaf–conifer forest at 1300–3200 m; plantations and thickets on local migration.

Food and Feeding. No information available.

Breeding. May–Jul. Nest up to 2·5 m above ground on branch or stump. Eggs 4–6, greyish-blue with reddish-brown spots. No other information.

Movements. Largely resident. N populations probably migrate S after breeding; recorded as scarce migrant at Beidaihe, on NE coast. Vagrant in N Vietnam.

Status and Conservation. Not globally threatened. Formerly considered Near-threatened. Uncommon to locally common. Poorly known species.

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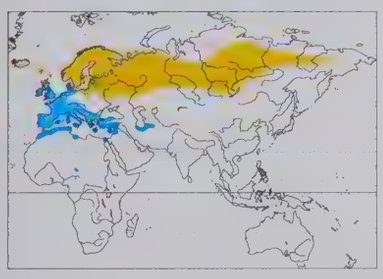
31. Redwing

Turdus iliacus

French: Grive mauvis **German**: Rotdrossel **Spanish**: Zorzal Alirrojo
Other common names: Red-winged Thrush

Taxonomy. *Turdus iliacus* Linnaeus, 1766, Europe "in sylvis acerosis" = Sweden.
In past, referred to as *T. musicus* but this name has been officially suppressed by ICZN. Two subspecies recognized.

Subspecies and Distribution.
T. i. coburni Sharpe, 1901 – Iceland and Faeroe Is; non-breeding W Europe.
T. i. iliacus Linnaeus, 1766 – N & E Europe E across Siberia to lower R Kolyma and Altai; non-breeding W & S Europe, N Africa, Black and Caspian Sea basins and adjacent SW Asia.



Descriptive notes. 20–24 cm; 46–80 g. Plumage is greyish-brown above, with long buffy-white supercilium; buffy-whitish below, long lines of blackish spots radiating from throat, orange-rufous on flanks and underwing; bill dark, yellowish base; legs pinkish-brown. Sexes similar. Juvenile is like adult, but buff-streaked above, heavily spotted below, with little orange-red. Race *coburni* is browner above and darker-spotted below than nominate. Voice. Song, by male from prominent high perch, a series of simple and rather monotonous phrases, each sweet and descending with final softer, twittery, drier, varied burbling chatter, "trúi-trúi-trúi trip-trr-bziriri-rrit"; at least 27 dialects noted in areas of S Norway, where males sing one particular dominant song type. Subsong, by flocks on migration and in winter, a low twittering chorus. Calls include distinctive drawn-out high-pitched buzz, "dssssi" or "srieh", as contact and hence irregularly, but very frequently at night on migration (becoming, in other contexts, a clearer "shriii"); also abrupt "chup" or "chittick" when feeding or going to roost in winter, hard sharp rattling "trrrt trrrt trrrt" when nest in danger, and loud chuckling "di-dju-dju-dju".

Habitat. Breeds in forest-open country mosaic in lowlands and relatively low hills, with preference for mid-successional conditions, especially in river basins and on floodplains: open deciduous or mixed forest margins with fields and mires, clearings in primary forest, regenerating managed forest at tall bushy stage with considerable understorey, shoreline thickets, tundra willow (*Salix*) and birch (*Betula*) scrub, scrubby semi-open cultivated sites, parks and gardens, thinned woodland with grassy areas around buildings; in Iceland and boreal montane regions breeds in rocky areas with often only sparse scrub. Recent colonists in Scotland breed in hedgerows, woodland edge, hillside birch woods and grounds of large private houses, also in swampy alder (*Alnus*) woods. Winters in open woodland, orchards and scrub thickets, wherever berry-bearing bushes and grassy areas in proximity; in Britain prefers dense even grassland as found in parks and on playing fields, usually keeping close to tall cover and frequently moving between the two, also stubble and fields of root vegetables with thorn hedges and open woodland, and penetrates urban gardens and city centres in colder weather (when may also move to coastal areas). In more S areas of winter range may reach higher elevations than elsewhere, e.g. in Morocco (where uncommon and irregular) occupies orchards, olive groves and cedars in High Atlas.

Food and Feeding. Invertebrates, also seeds and berries in autumn and winter. Animal foods include adult and larval beetles (Coleoptera) of at least eight families, adult and larval hymenopterans (ants, ichneumons, sawflies), adult and larval flies (Diptera), caterpillars, bugs (Hemiptera), orthopterans (crickets, mole-crickets), dragonflies (Odonata) and mayflies (Ephemeroptera), spiders, sandhoppers (Amphipoda), small crabs, millipedes (Diplopoda), small molluscs, earthworms and marine worms. Plant foods include fruits and/or seeds of cotoneaster (*Cotoneaster*), hawthorn (*Crataegus*), heaths (Ericaceae), strawberry (*Fragaria*), alder buckthorn (*Frangula*), ivy (*Hedera*), holly (*Ilex*), juniper (*Juniperus*), apple (*Malus*), pine (*Pinus*), cherry (*Prunus*), pear (*Pyrus*), buckthorn (*Rhamnus*), currant (*Ribes*), rose (*Rosa*), madder (*Rubia*), bramble (*Rubus*), elder (*Sambucus*), rowan (*Sorbus*), yew (*Taxus*), viburnum (*Viburnum*) and vine (*Vitis*), also various root crops. In spring and summer wide range of invertebrates taken, depending on local availability, but few studies. Autumn and winter diet much better known. In SW Iceland, prior to autumn migration, c. 800,000 fruits/ha available, mostly (c. 90% of fresh weight) *Empetrum nigrum*, with *Vaccinium uliginosum*, *Arctostaphylos uva-ursi*, *Vaccinium myrtillus* and *Rubus saxatilis*; *E. nigrum* most important component of diet (70–80% of fruits ingested), followed by *V. uliginosum* (c. 20%), while *R. saxatilis* avoided; mean width of seeds in droppings suggests preference for large *E. nigrum* fruits (having higher pulp-to-seed weight ratio). Autumn migrants on Holy I, in NE England, took mainly snails, and in three areas of S Britain 86% of 166 records of fruit-eating involved hawthorn; birds in field in E Britain, Oct–Feb, took 67% surface items and 33% subsurface items (in contrast to *T. pilaris*). In winter, diet in S France fleshy fruits (grapes, juniper berries, madder), gastropods and arthropods; in S Spain, 88 stomachs of birds wintering in olive groves held 86% vegetable matter by biomass (of which 97% olives), remainder made up by beetles and larvae, also the crop-damaging homopterans *Euphyllura olivina* and *Chrysomphalus dictyospermi*. Food brought to nestlings in N Sweden largely earthworms (77–96% of 3199 feedings over five years), supplemented mainly by flies and caterpillars; of 102 feedings in S Finland, 67% small earthworms, 27% adult insects (mainly mayflies, also beetles, dragonflies, flies) and 5% insect larvae. Forages mostly on ground and in low bushes.

Breeding. Early Apr to late Jul, with some latitudinal variation, from mid-May in Iceland; double-brooded. Generally solitary, but in optimal habitats may form loose colonies (or territories so small that appearance colonial), e.g. 8 nests in 0·075 ha of young spruce (*Picea*) in SE Finland (average nesting territory less than 100 m²); sometimes group nests within *T. pilaris* colony, and occasionally nest-site in close proximity to *T. merula* and *T. philomelos*. Nesting territory less than 1 ha and often less than 0·5 ha, but forages sometimes beyond borders in additional area up to 1·5 ha. Nest a bulky cup of grass, moss and twigs, bound with mud and bits of vegetation, lined with fine grass stems and leaves, placed on ground in thick vegetation or low in bush or tree or on rotten stump; of 451 nests in Swedish Lapland, 34% in tree, 28% on ground in vegetation, 17% in stump, 13% in juniper bush, and 8% on ground under juniper bush; 59% of 360 nests 0–0·5 m above ground, 23% 0·5–1 m up, 13% 1–2 m up, 5% higher. Eggs 4–6, rarely 3 or 7, pale blue to greenish-blue with fine reddish-brown speckling and mottling; incubation period 10–14 days, mostly 12–13 days; nestling period 12–15 days; post-fledging dependence 14 days; male may continue to feed young while female initiates second clutch. Of 259 nests in Swedish Lapland, 32% lost, mainly to crow (Corvidae) predation, hatching success of 286 eggs 81%, fledging sucess 69%, overall success 62%; in Finland, hatching success 69%, fledging success 73%, overall success 50%. Causes of mortality of ringed individuals in NW Europe are domestic predator 12%, human-related (accidental) 12%, human-related (deliberate) 57%, other 19%.

Movements. Migratory; a few resident on Icelandic coast, Norwegian coast, in Scotland and in S Baltic region. Distance travelled varies with origin and with severity of seasonal conditions; little winter site-fidelity. Migrates at night, usually in loose but extensive flocks. Almost entire population winters inside W Palearctic, so that birds breeding in extreme E part of range fly WSW at least 6500 km to reach nearest wintering grounds. Race *coburni* largely quits Iceland and Faeroes, passing through Fair Isle (off N Scotland) slightly later than nominate, some perhaps making long direct flight to Iberia; winter quarters in Britain, Ireland, W France, Spain and Portugal, birds from W Iceland mainly S of Loire valley, in France, those from E Iceland N of it. Other W Palearctic populations travel to C & S of region on three main migratory routes: (1) North Sea/British route, often via W Norway, (2) N/W continental Europe route via North Sea coast to Atlantic France and Iberia, (3) S/E continental Europe route via R Danube and R Po to W Mediterranean; some move SE, as Finland the main source of ringed individuals wintering in E Mediterranean and between Black and Caspian Seas. Vacates Sweden and Norway late Sept to mid-Nov, apparently on broad front. Much farther E, in SC Siberia, autumn departure much earlier, from end Aug, with only few left late Oct, while dates from farther W in Russia mainly in Sept to mid-Oct; passage around Kharkov, in Ukraine, starts end Sept, main passage end Oct, and in Caucasus lasts mid-Sept to mid-Nov. In Europe, heaviest winter concentrations in SW France, where arrival from late Sept, some moving into Iberia in Nov in some years but not until Jan in others; arrival in Italy mainly from mid-Oct to late Nov (peak mid-Nov), with much weaker spring return pattern; most ringed individuals derive from Baltic region but great majority there and in W Mediterranean may originate in Siberia. Uncommon irregular to regular winter visitor N Africa: Morocco mid-Oct to mid-Mar (most movement mid-Oct to mid-Nov, late Feb to mid-Mar), Algeria and Tunisia Nov–Mar, Libya Jan–Feb, Egypt late Oct to late Apr. Variously absent to fairly common in winter in Israel, passage (including winterers) mainly late Nov and Dec, departure mainly early Mar. Spring migration in France exhibits two peaks, in late Feb and in mid-Mar, but unclear whether two different breeding populations, two age-classes or different sexes. Spring migration in E Britain begins late Feb to early Mar, lasts into May; arrival S Norway end Mar or early Apr. Schedule of spring movements in E of range related both to latitude and to longitude, with birds moving out of Caucasus region Mar–Apr, passing through Ukraine late Mar or early Apr, arriving Arkhangel'sk and C Ural Mts late Apr, reaching Tomsk last week Apr or first week May. Fidelity of adults to breeding area higher than that of young to natal area: in ringing study in Norway, 21% of adults and 4% of nestlings returned in following season to study area in Oslo. Vagrants recorded in many areas, e.g. Pakistan and Afghanistan.

Status and Conservation. Not globally threatened. Generally common. Total population in Europe in mid-1990s estimated at 4,997,089–6,515,929 pairs (great majority in Fennoscandia, particularly Finland), with additional 100,000–1,000,000 pairs in Russia. By 2000 total European population (including European Russia) revised to 16,000,000–21,000,000 pairs and considered generally stable. Numbers, however, locally or regionally very variable owing to effects of harsh and mild winters, and of unfavourably cold summers, such that Finnish population fell from 2,700,000 pairs 1973–1977 to 1,500,000 pairs 1986–1989. Since 1930, steady expansion S through Baltic states and into Ukraine; since 1960s, outposted breeding population in Scotland. Density in optimal habitat may reach 0·7–1·2 pairs/ha (70–120 pairs/km²), and in suburban parks in Russia may extrapolate to 50–250 pairs/km²; normally much lower, 0·06–0·4 pairs/ha (6–40 pairs/km²), and always lower in conifers than in deciduous tracts; in S Finland, 18 pairs/km² overall, ranging from 3·3 in *Vaccinium*-floored mixed woodland to 94 in grassy-floored broadleaf woodland.

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32. Fieldfare

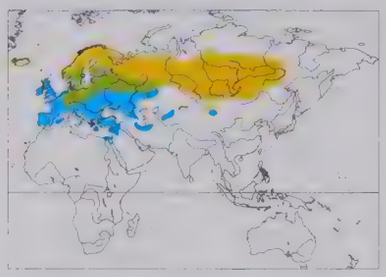
Turdus pilaris

French: Grive litorne **German**: Wacholderdrossel **Spanish**: Zorzal Real

Taxonomy. *Turdus pilaris* Linnaeus, 1758, Europe = Sweden.
Monotypic.

Distribution. Breeds Iceland and N & C Europe E to C Siberia (to Aldan basin and Transbaikalia) and in NW China (Tien Shan); non-breeding W & S Europe, N Africa and SW Asia.

Descriptive notes. 24–28 cm; 81–141 g. Gregarious, noisy large thrush. Has grey head and rump, brownish-chestnut mantle, back and upperwing-coverts, blackish tail, blackish lores, cheeks, malar and neck patch; white below, breast with orange-buff wash and black streaks, flanks with buff wash and black spots; white underwing-coverts; bill yellowish, dark tip; legs blackish. Sexes simi-



lar. Juvenile is more uniform brownish-grey above with buff scapular streaks, much stronger spotting below. VOICE. Song a tuneless chattering scratchy medley of squeaks, chuckles, wheezes, trills and chitters with harsh call notes admixed; sometimes given in flight at start of breeding season. Subsong fainter, more guttural and warbling. Call a loud 2-note or 3-note "shak-shak-shak"; "huii-huit" on migration, soft "quok" as warning at ground predator, deep "wu wu" in threat, agitated "tjetjetjetje" in alarm.

Habitat. Typically mixed habitat, mainly part-wooded and part-open country, commonly using trees for breeding and roosting, hedges and open ground for foraging; in particular, areas of permanent grass cover much preferred to temporary grass crops, winter cereals, stubble or bare ground; in extreme conditions may forage along beach high-water mark. Breeds in boreal forests of mixed pine (*Pinus*) and birch (*Betula*), also scrub, clearings, parks and gardens; in high latitudes extends in relatively small numbers beyond tree-line into alpine heathland and tundra scrub, and even to entirely bleak grassy islands in extreme N. Elevational limits unpredictable; in E Alps, in Europe, highest known breeding site was at 1300 m, but by 1984 breeding occurred at 2310 m. Winters mostly in lowlands, in often more open habitats, including grassy and cultivated fields, especially rough pasture and arable land within easy reach of tall trees and thick hedgerows, also moorland edges, woodland edges and orchards; roosts communally in conifers, deciduous woods, shrubs, reeds and hedgerows (often with other *Turdus* species), sometimes on ground in open. Outside breeding season favours watersheds with large, low-lying floodplains which provide good winter resources of soil invertebrates and fruit.

Food and Feeding. Invertebrates, and fruits found mainly in bushes and hedgerows. Invertebrates found mainly in and on soil in open fields, include earthworms, snails, slugs, leeches, millipedes (Diplopoda), centipedes (Chilopoda), harvestmen (Opiliones), spiders, beetles (Coleoptera), bugs (Hemiptera), crickets (Orthoptera), caterpillars, flies (Diptera), ants (Hymenoptera) and dragonflies (Odonata), very rarely (e.g. in near-freezing weather) small fish; fruits, berries and seeds eaten in winter, also shoots and buds in spring. Vegetable material extensive, variable with geography and season, includes fruits and/or seeds of apple (*Malus*, including *M. sylvestris*), barberry (*Berberis vulgaris*), bilberry (*Vaccinium myrtillus*), cowberry (*V. vitis-idaea*) and cranberry (*V. oxycoccus*), bird cherry (*Prunus padus*) and other cherries and plums including blackthorn (*P. spinosa*) and gean (*P. avium*), black bryony (*Talus communis*), bramble (*Rubus fruticosus*), cloudberry (*R. chamaemorus*), dewberry (*R. caesius*) and raspberry (*R. idaeus*), buckthorn (*Rhamnus catharticus*), cotoneaster (*Cotoneaster cornubia*), crowberry (*Empetrum nigrum*), currant (*Ribes*, including *R. uva-crispa*), elder (*Sambucus nigra*), *Viburnum* including guelder rose (*V. opulus*), hawthorn (*Crataegus*), holly (*Ilex aquifolium*), honeysuckle (*Lonicera periclymenum*), ivy (*Hedera helix*), juniper (*Juniperus*), lime (*Tilia cordata*), mezereon (*Daphne mezereum*), mistletoe (*Viscum album*), oleaster (*Elaeagnus angustifolia*), olive (*Olea europaea*), pear (*Pyrus communis*), pinks (*Dianthus*), privet (*Ligustrum*), rose (*Rosa*, including *R. canina*), rowan (*Sorbus aucuparia*), sea-buckthorn (*Hippophae rhamnoides*), shadbush (*Amelanchier*), snowberry (*Symphoricarpos rivularis*), spindletree (*Euonymus europaeus*), strawberry (*Fragaria*), sycamore (*Acer pseudoplatanus*), whitebeam (*Sorbus*), virginia creeper (*Parthenocissus*), vine (*Vitis*), yew (*Taxus baccatus*), sedges and grasses. Key elements are local abundance and food quality; in one winter study in UK, fed on the smallest number of different fruits, taking just twelve species, of which only four (forming 96% of all records) were highly important, in changing temporal sequence, hawthorn crucial in Oct–Nov, replaced by hips of dogrose Dec–Feb and ivy Mar–May, with holly important in very cold weather. In other studies, other fruits have figured as major foods. A key food in Scandinavia is rowan, which superabundant in some years (can then delay migratory populations until stocks significantly depleted). Among invertebrates, takes more in-soil items than on-soil ones, and earthworms commonest prey in summer quarters (Sweden), while in winter (Britain) food 37·5% insects, 36% fruits and seeds,14·5% earthworms, 5% other plant material, 4·5% slugs, 2·5% other invertebrates. In another study of winter diet in UK, 44% on-soil items (flies, beetles, spiders) and 56% in-soil items (earthworms, centipedes, slugs, beetle and tipulid larvae); as spring advanced, on-soil prey items became larger and their proportion in diet increased to 75%, indicating that size of prey was critical in foraging choice. Study in Norway found invertebrates to be main food in spring and autumn, but with change in composition from (spring) earthworms, adult beetles and ants, supplemented by berries of heath (mainly cowberry) and juniper, to (autumn) adult beetles, harvestmen and ants, supplemented by berries of crowberry and rowan; earthworms particularly important to females in spring; also, earthworms preferentially fed to young, along with tipulids, stoneflies (Plecoptera) and caterpillars. Forages mainly on ground, but also in trees and bushes; rarely hawks insects in air. Very rarely, scratches in leaf litter in manner of *T. merula*. In observations of feeding on fruit, used hovering in only 1·2% of attempts.

Breeding. Early Apr to late Aug throughout range, varying with latitude, in N areas timing linked to disappearance of snow cover; commonly double-brooded in Switzerland, rather rarely so elsewhere. Monogamous, pairing rapid and courtship without ceremony; extra-pair copulations probably very common; conspecific brood parasitism occurs, in one study 11·5% of nests had eggs laid by another female. Sometimes solitary breeder, especially in S of range, but commonly in colonies with nests 5–30 m apart, largest known colonies (in Norway) containing hundreds of pairs, but most much smaller, and breeding dispersion such that sometimes difficult to judge whether nesting colonial or solitary; fluctuations in colony size result from different causes of mortality, nest predation selecting for larger colonies (mobbing of predators more effective), but chick starvation (caused by over-exploitation of local resources) and adult predation selecting for smaller colony size; fluctuations in position of colony site presumably relate to local conditions. Territory size variable, usually very small, especially for pairs in middle of colony; solitary nesters may defend c·1 ha, whereas colony-nesters usually defend only the nest tree (rarely ever two nests in same tree). Nest a bulky, untidy cup, deeper at higher latitudes than at lower ones, made of twigs, roots, moss, lichen, grass and leaves, lined with animal hair, rootlets and fine grass, and cemented with mud; placed in fork of tree or against trunk or on branch, usually towards upper levels of tree and normally at least 2 m off ground, occasionally on ground, sometimes in cliff face; usual nest heights 7–10 m in C & E Europe, whereas average in Scandinavia and Russia 4–5 m (owing either to lower trees or to lower human density, or both, in latter areas); larger females tend to nest higher than do smaller ones, and larger eggs found in higher-placed nests than in lower ones, suggesting that fitter individuals select greater heights in trees, but nests in colonies tend to be at same heights and in same tree species; in areas with sparse tree cover, nests sometimes placed on beam of abandoned building, bridge strut, window sill, fence, pylon or roof; up to 71% of colonies in N Norway associated with breeding Merlins (*Falco columbarius*), as a means of harnessing the raptor's aggression towards potential predators. Eggs 3–7, usually 5–6 (5 commoner at lower latitudes, 6 at higher, but number decreasing with altitude), pale blue with fine speckles, spots and blotches of reddish-brown; incubation, often starting from third egg, 12–15 days, average 13 days; nestling period 12–15 days; post-fledging dependence generally c. 15 days, but up to 30 reported; fledglings spend first 4 days close to nest until better able to fly. Of 758 nests in Germany, 40% produced fledged young, average 1·8 young per nest and 4·6 young per successful nest; average number of fledglings per successful nest in Norway, 1967–1975, varied from 3·7 to 5·05. Nest predation very common, and adults attack avian predators (raptors, crows) with aggressive dive-bombing flights, often terminating with faecal spraying; mammalian nest predators are frequently successful despite mobbing, especially at larger colonies; ground-nesting pairs in alpine heathland much less aggressive and more discreet, presumably because nests far less conspicuous; body condition of adults, variable with year, also influences degree of aggression. Annual mortality 60–70% in Switzerland, 61–65% in Finland; causes of mortality of ringed individuals in NW Europe are natural causes 10%, human-related (accidental) 13%, human-related (deliberate) 58%, other 19%.

Movements. Migratory, but movements essentially irruptive and nomadic, so that overall nature of these complex and variable. In Norway, autumn and winter temperatures, and rowanberry production, influence degree of emigration; in some years significant proportion of breeding population remains in the country. In autumn, early migrants (Jul–Aug) mainly birds of the year, with bulk of adults moving later (mainly Sept–Nov). Migrates both by day and by night, mostly in small parties, sometimes large loose flocks. From breeding areas in N Europe migrates W & S (initially often WSW, then increasingly S) to winter in S Europe; longest recorded migration by four juveniles, which flew 6100 km from E Siberia to W France. Some, however, remain in more N areas, and mid-winter movements of large numbers may occur there, evidently as conditions in certain quarters become harsher. Presence in winter in N Africa dependent on weather, common when winter in Europe harsh but rare or absent when mild there; generally Oct–Mar, but very variable. In Israel, where absent or common depending on year and weather, passage mainly mid-Nov to mid-Dec and Feb. In S of its winter range tends to be irregular in numbers, with influxes determined by weather farther N, e.g. major influxes in Italy in 1936/37, 1952/53 and 1965/66. Little evidence of site-fidelity or flyway-fidelity, with few retraps of ringed individuals at same stations; one ringed in E Germany in Feb 1979 was in Greece in Feb 1981, and another wintering W Germany visited Cyprus in following year. Some Asian breeders winter in China, and the species is now known to pass through Mongolia. In spring, males tend to move back towards breeding areas well in advance (typically a week) of females; first-years tend to be later than older birds. Spring arrival on breeding grounds in Germany late Feb to late Mar; in Norway arrivals span second week Apr to third week May, depending on latitude and altitude. Records from non-breeding parts of range in Jun and Jul suggest oversummering non-breeders. Vagrants or occasionals recorded S to Atlantic islands, Arabia, India and Japan; casual in Canada.

Status and Conservation. Not globally threatened. Common. Global population many tens of millions, with substantial increase in numbers in Europe in past 100 years and no known commensurate decline elsewhere in range; but numbers vary annually, and extrapolations highly speculative. Colonized Germany 1850–1900, Switzerland 1923, Greenland (apparently) 1937, Hungary 1947, Iceland 1950, French Jura 1953, Denmark 1960, Romania 1966, Britain 1967, Italy and Belgium 1968, Netherlands 1972, former Yugoslavia 1975, Greece early 1980s, Macedonia 1986. National population estimates include 560,000 pairs in Finland, 1,500,000 pairs in Sweden and probably similar figure in Norway, 1,000,000 pairs in Germany, 10,000 pairs in Belgium (in 1983) and a similar figure in France, and 700 pairs in Netherlands (in 1990), yielding a speculated 5,000,000 pairs for W Europe. In 2000, total European population judged to be 14,000,000–24,000,000 pairs and considered generally stable. Given a breeding range of c. 10,000,000 km² and breeding density of 1–3 pairs/km², a global population of up to 60,000,000 adults is possible, with twice this number predictable at end of a good breeding season. Capacity for population increase notable, e.g. mean increment in Belgium, 1968–1983, was 670 pairs per year. Estimated wintering total in UK 1,000,000 individuals. Recently colonized subalpine zone of Altai Mts. In S Greenland, a few bred since 1937 but apparently exterminated by severe winters in 1960s; possibly still breeds.

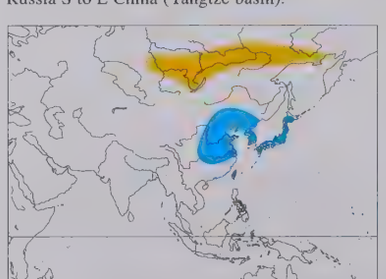
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33. Naumann's Thrush

Turdus naumanni

French: Grive de Naumann **German**: Rostschwanzdrossel **Spanish**: Zorzal de Naumann
Other common names: Rufous-tailed/Red-tailed Thrush

Taxonomy. *Turdus naumanni* Temminck, 1820, Silesia and Austria....Hungary.
Frequently treated as conspecific with *T. eunomus*; taxonomic separation based on very different phenotypic characters, but the two intergrade over wide area; further study required. Monotypic.
Distribution. SC Siberia (middle R Yenisey E to middle and upper Lena basin); S boundary uncertain, perhaps discontinuous E of L Baikal, but in W embracing Angara basin and S L Baikal; small groups also breed N of main range, near Lena and Olenek deltas. Non-breeding from extreme SE Russia S to E China (Yangtze basin).



Descriptive notes. 23–25 cm; 63–81 g. Male is pale olive-tinged grey-brown above, with pale rufous-buff supercilium, pale rufous scapular tips and median upperwing-coverts, pale rufous tail; orange-rufous below, with narrow dark-spotted malar, and whitish scalloping on lower breast to vent; bill dark, yellowish lower mandible; legs yellowish-brown; occasional variant (possibly first-year) has paler throat and stronger malar, recalling female. Various intermediates, with *T. eunomus*, e.g. with head and upperparts as described but with areas of orange-rufous on edges of secondaries and tertials, feathers of breast usu-

ally black-centred with white fringes, becoming dark orange-chestnut on lower breast, belly and flanks. Female is like male, but no rufous on wing, browner tail, buffy throat with stronger malar. Juvenile is like adult, but heavily buff-streaked on mantle and scapulars, black-spotted below. Voice. Song, by male, inadequately documented, consists of brief phrases at intervals of several seconds, each phrase beginning with thin whistling and crescendoing into harsh rattling warbling, very reminiscent of song of *T. iliacus*. Calls also very poorly documented, probably similar to those of *T. eunomus*; spring migrant gave insistent "swer-swer-swer" in alarm, thin rasping "zeep" when taking off, and conversational "que-que-que".

Habitat. Fringes of lowland tundra in thinning taiga and wooded steppe, dense riverine stands of willow (*Salix*) and poplar (*Populus*), scrubby lowland areas with birch (*Betula*) and alder (*Alnus*), less often in sparse larch (*Larix*) or mixed larch and pine (*Pinus*) cover, extending into open country, gardens. On passage in lowland floodplain habitats, also in scrub oak (*Quercus*) and on stubble fields. In Japan, prefers roosts in copses on hillsides.

Food and Feeding. Insects and insect larvae, also bilberries (*Vaccinium*); in autumn also berries of corktree (*Phellodendron*). Stomachs of 48 birds from China held 81% insects injurious to agricultural crops and forest.

Breeding. May–Jun. Further information poorly discriminated from that for *T. eunomus*, but major differences unlikely.

Movements. Migratory. Autumn movements in Russia noted from Sept to Nov (Sept in Yakutsk, mid-Sept to mid-Oct in Lesser Khingan range); migrates through Mongolia and Korea (where some remain) to winter mainly in China, from Heilongjiang S to R Yangtze, small numbers reaching Japan and Taiwan. Main autumn passage at Beidaihe, in NE China, Oct (c. 2 weeks earlier than *T. eunomus*). Recorded in Korea early Oct to late May, mainly Nov–Mar. Probably winter visitor to Myanmar in small numbers. Spring return extends from Apr into early Jun, but seen as early as mid-Mar in Russian Far East; passage continues through Apr on R Lefu (SE Russia), with arrival on breeding grounds during May. Vagrants recorded as far W as W Europe.

Status and Conservation. Not globally threatened. Fairly common to common. In non-breeding season, common in N Korea and abundant in S Korea; in China, fairly common in Shanghai area in winter and abundant farther S on passage; rather uncommon throughout Japan. Hunted for food in rural China.

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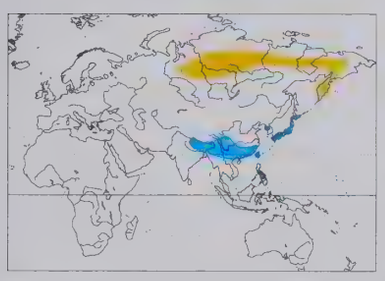
34. Dusky Thrush

Turdus eunomus

French: Grive à ailes rousses **German**: Rostflügeldrossel **Spanish**: Zorzal Eunomo
Other common names: Spotted Thrush

Taxonomy. *Turdus eunomus* Temminck, 1831, Japan.
Frequently treated as conspecific with *T. naumanni*; taxonomic separation based on very different phenotypic characters, but the two intergrade over wide area; further study required. Monotypic.

Distribution. Breeds NC & NE Siberia from lower R Yenisey E to W Chukotka and Kamchatka; S limit uncertain but includes middle Angara basin, middle and upper R Podkamennaya Tunguska and upper R Lena, and possibly S to L Baikal, and extending E to at least upper Vitim. Non-breeding from NE Indian Subcontinent E to Japan.



Descriptive notes. 23–25 cm; 55–106 g. Male is boldly blackish and white on head, with black of crown and ear-coverts meeting on nape, whitish supercilium, subocular line, broad submoustachial and throat, narrow black-spotted malar streak; upperparts blackish with narrow rufous scalloping, rufous wings; blackish on breast and flanks, increasingly broad whitish scalloping on latter towards vent, off-white belly to vent; bill dark, yellow lower mandible; legs dark brown. Intermediates with *T. naumanni* occur in extensive contact zone between breeding populations, many resembling present species but with mantle, back and scapulars heavily washed deep copper-brown, median and greater wing-coverts golden-brown. Female is like male, but brown above and on head, no rufous in wings, less white on throat. Juvenile is as adult, but extensively spotted buff above and blackish below, without adult's black breastband; first-winter like female, but with blackish feather centres on much of upperparts. Voice. Song, by male from high in tree, a series of short, loud, musical phrases of 3–5 notes which include rich melancholy flutings, downslurred whistles and dry trills, also sometimes much more sustained and rich, with quality reminiscent of song of *Luscinia megarhynchos*, *T. merula* or *T. philomelos*, "veet tyulir-tyulir fru-fru fir-fee veet-veet tyulir-tyulir che-che-che-che veet-veet-veet fru-fru-pryupee-pryupee..."; apparently more powerful and varied than that of *T. naumanni* (but latter inadequately known, and comparison therefore provisional). Calls include subdued staccato "chuck" notes in mild alarm or as warning, strident rhythmic "chek-chek-chek-chek" e.g. when going to roost, conversational "kveveg" or "wäwä" for contact (often in flight) when often becomes variable musical chattering, also dry shrill rasping "shrrrt!" or "spirr" on flushing.

Habitat. Breeds in lowland tundra edges, scrub, dense riverine stands of willow (*Salix*) and poplar (*Populus*) and wooded steppe, sometimes open coniferous woodland, and also reaching more open areas; habitat similar to that of *T. naumanni*, but generally extending into more montane terrain. Winters in hillside scrub, open grassy areas, sparse woodland, cultivated farmland, orchards and grassland with scattered trees, suburban parks and gardens, from foothills to 3000 m.

Food and Feeding. Stomachs from China, in period Apr–Nov, held beetles (Coleoptera), locusts (Locustidae), insect larvae and plant seeds; in Nov–Feb, fruits and seeds, including juniper (*Juniperus*) and ash (presumably *Fraxinus*), but also beetles, ants (Hymenoptera), earthworms and spiders. On passage in Russia, takes chiefly grapes and buckthorn berries, also rowanberries. Forages largely on ground.

Breeding. May/Jun-Aug. Nest a crude cup of various grasses, twigs and moss, mixed with mud and lined with fine grass, placed up to 5 m above ground, but often below 1 m, in small isolated tree. Eggs 4–6, greenish-blue with reddish-brown streaks. No other information.

Movements. Migratory. Winters from S Japan and Taiwan S & W through S China, NW Thailand, N Myanmar and E Himalayan foothills; small numbers winter in E Siberia. Quits Kamchatka Peninsula first half Sept, with passage in Ussuriland mid-Sept to mid-Oct and around Krasnoyarsk (SC Siberia) early Oct. In NE China, main autumn passage in Heilongjiang Sept and first three weeks Oct, but in Beidaihe mid-Oct to mid-Nov (c. 2 weeks later than that of *T. naumanni*); bypasses Korean Peninsula in autumn, but occurs in S Korea in Apr. Large flocks arrive in Japan late Sept, with peak from mid-Oct to Nov, spreading down to lower elevations to reach Kanto Plain and other lowland areas farther S for winter; spring passage covers mid-Mar to early May. In Hong Kong a scarce winter visitor, with 89% of records Jan–Mar; pattern rather irregular and irruptive. Winters in low numbers in Himalayas (rare and irregular in W, scarce in E) from N Pakistan E to NE India. Spring passage extends from mid-Mar in Russian Far East, where generally a few days later than *T. naumanni*, reportedly not appearing around L Khanka (SE Russia) until last third of Apr and continuing through into mid-May; arrives on breeding grounds middle to end May. Vagrants recorded Europe, Middle East and NW North America.

Status and Conservation. Not globally threatened. Common. In winter rare in N Korea, commoner in S Korea (mainly spring). Common to abundant on S Kurils, Hokkaido, Honshu, Sado, Shikoku, Kyushu and the smaller islands of Japan; has recovered from the persecution that lasted until 1947, when up to 5 million taken annually for the grilled-bird trade, which considerably suppressed wintering numbers. In China, the most abundant thrush in winter in Fujian and common in Shanghai area. Scarce visitor in Myanmar, NW Thailand, N Vietnam. Hunted for food in rural China.

Bibliography. Anon. (2000a), Ali & Ripley (1987b), Austin (1948), Austin & Kuroda (1953), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1964, 1987), Clement (1999a), Clement & Hathway (2000), Cramp (1988), Dementiev *et al.* (1968), Glutz von Blotzheim & Bauer (1988), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Herklots (1967), Inskipp & Inskipp (1991), Lee Woo-Shin *et al.* (2000), MacKinnon & Phillipps (2000), Mauersberger (1980), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Sowerby (1943), Stepanyan (1983), Tomek (2002), Vaurie (1955c), Williams (2000).

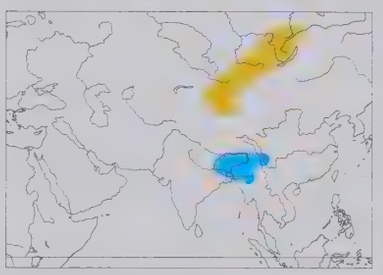
35. Rufous-throated Thrush

Turdus ruficollis

French: Grive à gorge rousse **German**: Rotkehldrossel **Spanish**: Zorzal Papirrojo
Other common names: Dark-throated Thrush (when treated as conspecific with *T. atrogularis*)

Taxonomy. *Turdus ruficollis* Pallas, 1776, Dauria = Transbaikalia, Russia.
Often treated as conspecific with *T. atrogularis*; taxonomic separation based on several very different phenotypic characters and considerable vocal differences, but the two intergrade over wide area; further study required. Monotypic.

Distribution. SC Siberia (E Altai and Baikal area) S to N Mongolia and NW China; non-breeding NE Indian Subcontinent E to S China and NE Myanmar.



Descriptive notes. 24–27 cm; 63–103 g. Male is dull pale grey above, with dull rufous-chestnut supercilium, subocular area and chin to lower breast and neck side; dull rufous tail with dull grey central feathers; off-white belly and flanks with broad vague streaking; bill dark, yellowish lower mandible; legs reddish-brown. Hybrids with *T. atrogularis* tend mainly to resemble latter, but with some rufous or purple evident in black areas, and varying amounts of rufous in tail. Female is like male, but paler rufous on face and throat, latter with blackish streaks. Juvenile is dull brown-grey with greyish spots and streaks above, buff-grey on throat, with dark malar leading to thickly spotted breast side, and more dispersed spotting below. Voice. Song, by male, a series of spaced-out, short simple fluty phrases, "chooee-chooee... chulee chill-veeta... chvya-chya-chvya-chya...", lacking the rambling, chattering quality of *T. atrogularis* song. Calls include hoarse high "kwee-kweek" and more conversational "skrie-kri-kriek, kukukukuk, sweesweek"; flight note a thin "tseep".

Habitat. Sparse montane forest, upper limit of cedar (*Cedrus*) forest, mossy tree-line scrub, plateau taiga, and bottomland forests in montane river valleys. Winters in open juniper (*Juniperus*) woodland, scrub and orchards, from foothills to 3900 m.

Food and Feeding. Invertebrates and, mainly in autumn and winter, berries and some seeds. Stomachs of summer birds in Russia held beetles (Coleoptera), those of autumn individuals blueberries. Nestlings seen to be fed mainly with earthworms, caught along lakeshores and by potholes; food brought to one Russian nest (in Chita) comprised 93% insects, mainly flies (Diptera), along with spiders and earthworms. Forages mainly on ground and in low vegetation; in winter, often in mixed flocks with other thrush species.

Breeding. May–Jul in Russia. Nest a cup of twigs, moss and stems cemented with mud, lined with finer stems, placed low down, usually below 2 m, in rotten stump or in sheltered fork of tree, frequently larch (*Larix*) or poplar (*Populus*), or cedar shrub. Eggs 4–5, pale blue with many small cinnamon spots; incubation period 10–12 days; nestling period 11–13 days.

Movements. Migratory. In Altai, pairs that finish nesting early move to lower elevations mid-Jul, most of population following in Aug. Main autumn departure Sept-Oct. Migrates through Mongolia and W China to winter mainly on Himalayan slopes from Bhutan E to N Myanmar and W China; scarcer farther W, in Nepal; straggles W to Afghanistan. Most records in NE Myanmar are in Feb–Mar. Spring passage in Mongolia mainly mid-Apr to early Mar; appears around Irkutsk mid-Apr and in C Gobi Desert and SW Transbaikalia in late Apr. Vagrants recorded in Europe, Japan, Taiwan and NW Thailand (Doi Inthanon).

Status and Conservation. Not globally threatened. Densities over large breeding range variable with habitat; 32 birds/km² at one lakeside area in Altai, 13 birds/km² in sparse pine (*Pinus*) in Tuva, and maximum of 1 bird/km² in larch stands E of L Baikal (but these values unrepresentatively low). Fairly abundant in winter in NE India. Commoner than *T. atrogularis* in winter in Myanmar.

Bibliography. Adamian & Klem (1997, 1999), Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Arkhipov *et al.* (2003), Beaman & Madge (1998), Cheng Tsohsin (1987), Clement (1999a), Clement & Hathway (2000), Cramp (1988), Dementiev *et al.* (1968), Glutz von Blotzheim & Bauer (1988), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Mauersberger (1980), Meyer de Schauensee (1984), Piechocki *et al.* (1982), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Stepanyan (1983), Vaurie (1972).

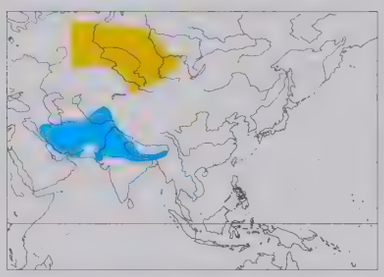
36. Black-throated Thrush

Turdus atrogularis

French: Grive à gorge noire **German**: Schwarzkehldrossel **Spanish**: Zorzal Papinegro

Other common names: Dark-throated Thrush (when treated as conspecific with *T. ruficollis*)

Taxonomy. *Turdus atrogularis* Jarocki, 1819, Poland.
Often treated as conspecific with *T. ruficollis*; taxonomic separation based on several very different phenotypic characters and considerable vocal differences, but the two intergrade over wide area; further study required. Proposed race *vogulorum* (from Ural Mts) considered unwarranted, possibly representing clinal variation. Monotypic.
Distribution. E European Russia (Ural Mts) E to NC Siberia, S to Tarbagatay Mts and NW Mongolia; non-breeding SW & S Asia.



Descriptive notes. 24–27 cm; 54–110 g. Male has black face, throat and breast; dull grey above, tail black; lower breast, breast side, belly and flanks off-white with broad, indistinct streaking; bill dark, yellowish lower mandible; legs reddish-brown. Hybrids with *T. ruficollis* have some rufous or purple in black areas, varying amounts of rufous in tail. Female is like male but duller, has some whitish feather tips on throat and breast, a few thin blackish streaks on flanks. Juvenile is dull brown-grey with buffish streaks and spots above, buffish below, paler on throat and belly, with dark malar, thickly dark-spotted breast, less densely spotted flanks. Voice. Song a simple series of rather slow-paced, rambling phrases, many of which consist of chatters and rich low husky disyllabic notes, e.g. "chip-chip-chip…chi-chi-chi-chi…cherr-vóó, cherr-véé, chet-chet-chet…". Subsong a sustained delivery of simple phrases and whistles. Calls include thin "seet", high squeaky repeated "qui-kwea" for contact, and throaty chuckling "which-which-which" in alarm.
Habitat. Breeds in variety of habitats, including pure coniferous forests (occupying edges along rivers and streams, glades and clearings), sparse dry woods, larch (*Larix*) clumps, semi-open willow (*Salix*) scrub, groves of poplar (*Populus*) and birch (*Betula*), buckthorn (*Rhamnus*) thickets and wooded bogs, to 2200 m but generally lower; after breeding, some family parties move upwards into sparse subalpine woodland and shrubbery. Winters on grassy scrubby hillsides and in forest edge, willow groves, fields, gardens, orchards, pastures and cultivated ground, from lowlands to 4200 m; in Saudi Arabia in cultivated areas and by water-filled wadis; vagrants in Israel recorded in areas with mixed trees and thickets by fields, e.g. date-palm groves and pinewoods.
Food and Feeding. Insects, including grasshoppers (Orthoptera), beetles (Coleoptera) and caterpillars, also earthworms, snails; also berries, which form staple diet in winter. In Kirghizstan, stomachs of 75 birds held mainly adult and larval beetles, caterpillars and other invertebrates. Winterers in Pakistan seen to feed on rosehips in *Rosa lacerans* thickets, fallen juniper (*Juniperus*) berries and berries of *Hippophae rhamnoides*, but also on worms, termites (Isoptera) and insect larvae, even on human faeces outside settlements. Wintering birds in Nepal fed extensively on nectar of flowering rhododendron trees in early Apr. Food brought to nestlings in Tomsk mainly earthworms, but also caterpillars and beetles. Forages on ground and in bushes, notably rhododendrons in winter; reported as taking animal food from unfrozen stream margins. Highly gregarious when not breeding.
Breeding. May–Jul; single-brooded. Territory small, nests may be as close as 20–30 m to each other. Nest a cup of grass stems, plastered internally with mud, lined with fine grasses, placed low down in tree, on stump or on ground. Eggs 4–7, bluish-green with light brownish blotches and freckling. Incubation period 11–12 days; nestling period 11–13 days.
Movements. Partial or full migrant; winter distribution and abundance variable with weather conditions. Autumn departure mid-Aug to Oct, e.g. departure around Krasnoyarsk (SC Siberia) mid-Oct and passage in Semipalatinsk to end Oct; Ob and Irtysh Valleys important migration corridors. Migrates through Iran, Afghanistan and Mongolia to winter in area from Iraq and Arabia E across S Asia, including N Afghanistan (Sept–Apr) and Turkmenistan, to NE India and N Myanmar, sometimes N to extreme S Kazakhstan; uncommon winter visitor to Arabian Peninsula (Bahrain Oct–Mar, mainly Dec–Jan). In Ladakh, passage early Sept to Nov, numbers building to peak in late Oct, and early winter roosts forming during Nov. Nepal winter influx rather late, but dates uncertain and probably variable with seasonal weather. Arrives N Pakistan mid-Oct and spreads thinly S by end Nov, retreating N in Mar but lingering in N into early May. Spring passage in India Mar–Apr, and Turkmenistan Mar to early Apr, Tadjikistan until late Apr or early May, Russia late Apr to mid-May or later; arrival around Krasnoyarsk mid-Apr, Tomsk 15th–20th Apr, Omsk early May. Vagrants W to Israel Nov–Feb, also to Europe, Japan and Thailand.
Status and Conservation. Not globally threatened. Population in European Russia (W slope of Urals) 50,000–55,000 pairs. Typical breeding densities in Pechora Basin 4·8 birds/km² in montane birch, 17–25 birds/km² in spruce (*Picea*) woods, 36 birds/km² in montane willow and 48 birds/km² in montane larch; in waterside willow stands near Novosibirsk as many as 136 birds/km², with 40/km² in interior of mixed woods. One of most abundant thrushes in Altai region and generally common in Russia. Locally abundant in winter in Pakistan. Fairly abundant in winter in NE India.

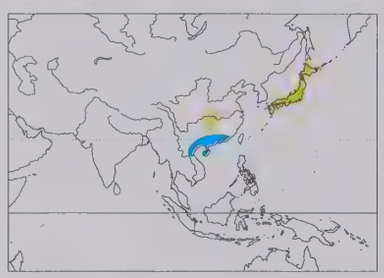
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Beaman & Madge (1998), Chadwell *et al.* (1982), Cheng Tsohsin (1987), Clement (1999a), Clement & Hathway (2000), Cramp (1988), Dementiev *et al.* (1968), Gallagher & Woodcock (1980), Glutz von Blotzheim & Bauer (1988), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Nightingale & Hill (1993), Paludan (1959), Piechocki *et al.* (1982), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Shirihai (1996), Silsby (1980), Smythies (1986), Stepanyan (1983), Vaurie (1972).

37. Japanese Thrush

Turdus cardis

French: Merle du Japon **German**: Scheckendrossel **Spanish**: Zorzal Japonés
Other common names: Grey/Japanese Grey Thrush

Taxonomy. *Turdus cardis* Temminck, 1831, Japan.
Chinese birds previously separated as race *lateus*, reportedly having sharper division between jet-black nape and slaty-black mantle, more uniformly dark flanks and brownish legs, but characters apparently variable. Monotypic.
Distribution. CE China and Japan; non-breeding N Indochina and SE China.



Descriptive notes. 21–22 cm. Male is black on head to nape and breast, slaty black on rest of upperparts; white belly to vent with black "inverted heart" spotting on upper belly and flanks; bill, narrow eyering and legs yellow. Female is greyish olive-brown above, whitish below, with bold dark streaking or spotting and light orange-russet wash on neck side and flanks. Juvenile is olive-brown to brown with pale buff streaks and dark feather tips above, buff with brown spots below, whiter on vent, resembles washed-out yellowish juvenile *T. eunomus* but lacks supercilium, has colder brown wings and more obvious white rear belly to vent; first-summer male dimorphic, either like adult male with slaty-grey on back, wings and tail, or like female with olive-grey upperparts, light buff wingbar (greater coverts) and less even, more heart-shaped spotting. Voice. Song, from treetop, rich in quality, long and warbling, rising and falling in pitch, with rhythm recalling that of *T. philomelos* and tone recalling *T. merula*. Calls include thin "tsweee" or "tsuuu" and hollow "chuk".
Habitat. Broadleaf deciduous and mixed evergreen forest, preferring dark shady valleys and streamsides with sparse undergrowth; also forest edge, light deciduous forest, secondary growth, shrine precincts, occasionally even gardens and scrub in plains, hills and low mountains. Mainly 400–1200 m on Honshu, but almost to sea-level on Hokkaido. In winter frequents woodlands, especially around cultivated areas; in Hong Kong found in forests, *fung shui* (traditionally protected) woodland and more lightly wooded areas, including urban parks.
Food and Feeding. Insects and fallen fruits. Scratches in leaf litter.
Breeding. From May in China and Apr–Aug in Japan; double-brooded. Nest made of twigs, grasses and vines with much external moss, bound with mud, lined with hair, rootlets and pine needles, placed 1–4·5 m up in tree fork, often near water. Eggs 2–5, usually 4, pale blue-green, cream or grey-brown with reddish-brown and lilac markings; incubation period 12–13 days; nestling period in captivity 14 days; captive female began new nest 3 days after first brood fledged.
Movements. Migratory. Winters in Indochina S to C Laos and NC Vietnam, and in coastal areas of SE China, including Hainan. In N Japan autumn departure from Aug to mid-Oct, some remaining at low elevations into Nov, with passage in S Japan Oct–Nov, rarely into Dec; spring return in early Apr, reaching Hokkaido in May. Records in Hong Kong span second week Nov to third week Apr, with peaks late Dec to early Jan (possibly an artefact of observer activity) and late Mar to early Apr. Rare on passage Korea and Taiwan; vagrant in N Thailand and S Laos.
Status and Conservation. Not globally threatened. Relatively scarce to uncommon in China. In Japan, common breeder on Hokkaido and N & C Honshu, less common in SW Honshu, Sado, Shikoku and Kyushu; may be extending range into lowland urban areas in Kanto Plain. Recent report of breeding in Korea now doubted. Uncommon to locally common winter visitor in Indochina, and judged rather rare in Vietnam; overall numbers of records appear to have declined in Hong Kong since 1970s.

Bibliography. Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dornberger & Barthel (1997), Duckworth, Davidson & Timmins (1999), Finch & Kennewell (1994), Gore & Won Pyongoh (1971), Herklots (1967), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Robson (2000), Tomek (2002), Wildash (1968), Zheng Guangmei & Zhang Cizu (2002), Zysk (1992).

PLATE 53 ➤

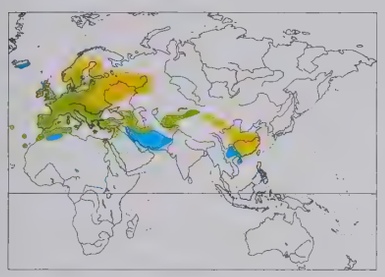

inches
4
cm
10
ssp merula
variants
ssp mauritanicus
38
ssp syriacus
ssp mandarinus
39
ssp kinnisii
40
ssp simillimus
ssp nigropileus
41
42
ssp torquatus
ssp amicorum
ssp alpestris

38. Common Blackbird

Turdus merula

French: Merle noir **German**: Amsel **Spanish**: Mirlo Común
Other common names: Blackbird, Eurasian Blackbird, Black Thrush; Chinese/Eastern Blackbird (*intermedius*, *sowerbyi* and *mandarinus*)

Taxonomy. *Turdus Merula* Linnaeus, 1758, Europe = Sweden.
Formerly considered conspecific with *T. maximus* and *T. simillimus*. E races *intermedius*, *sowerbyi* and *mandarinus* possibly warrant separation as a distinct species on basis of size, structure and voice. Proposed race *insularum* from S Greek islands (Lesvos, Andros, Ikaria, Samos, Crete, Rhodes) considered indistinguishable from *syriacus*. Nine subspecies recognized.
Subspecies and Distribution.
T. m. merula Linnaeus, 1758 – Europe (except N & SE).
T. m. azorensis Hartert, 1905 – Azores.
T. m. cabrerae Hartert, 1901 – Madeira and W Canary Is.
T. m. mauritanicus Hartert, 1902 – NW Africa.
T. m. aterrimus (Madarász, 1903) – SE Europe, W & N Turkey, Caucasus area and N Iran; non-breeding also Middle East.
T. m. syriacus Hemprich & Ehrenberg, 1833 – islands of S Greece (N Cyclades and Crete), SW & S Turkey and Levant.
T. m. intermedius (Richmond, 1896) – Tien Shan S to NW and NE Afghanistan; non-breeding Iraq E to S Afghanistan.
T. m. sowerbyi Deignan, 1951 – C China (Gansu S to W Sichuan); non-breeding S China and N Indochina.
T. m. mandarinus Bonaparte, 1850 – E China (E from E Sichuan and Guizhou); non-breeding S China, Hainan and N Indochina.
Introduced Australia, Tasmania and New Zealand, subsequently present also Lord Howe I, Norfolk Is, Macquarie I and Kermadec Is.



Descriptive notes. 24–27 cm, *mandarinus* 28–29 cm; 60–149 g (mainly 85–105 g). Male nominate race is entirely black, with yellow or orange-yellow bill and eyering, blackish legs. Female is dull dark (slightly rufous) brown, paler and vaguely brown-mottled below, with buff-brown submoustachial stripe and throat divided by indistinct malar, bill brownish with some dull yellow basally. Juvenile is dark brown with extensive buff streaking above, double buff-spotted wingbars, buff with extensive dark mottling and streaking below; first-summer male differs from adult in dusky bill and eyering, browner wings. Races differ mainly in size and in tone of plumage, especially of female: *azorensis* is smallest, short-winged, female blackish-brown with dark-streaked greyish throat, yellow bill; *cabrerae* is small, female blackish-brown with limited grey throat, yellow bill; *mauritanicus* is small, male glossier, female darker with yellow bill; *aterrimus* is slightly smaller and smaller-billed, male dull black, female paler above and greyer below; *syriacus* male is more slaty-toned, female greyer; *intermedius* is large, with largest bill, male sooty black, female blackish-brown; *mandarinus* large, male is sooty black above, brownish-black below, female only slightly browner, with paler chin and throat; *sowerbyi* is smaller and darker below than last. Voice. Song, by male from elevated perch, a leisurely series of very mellow, slurring whistled phrases (up to 100 phrase types documented in introduced population in Australia), usually ending with short gabbled twitter in which mimicry sometimes present; phrases not repeated (except perhaps early in season); song most complete, rich and complex at dawn, daytime song often less sustained and more distracted; pre-roost song often has curtailed phrases and repetitions, may be given from variety of perches as territory-marking. Female has subsong response during courtship. Subsong of male, fairly common in autumn and winter, a subdued sustained warbling with occasional alarm notes. Calls include high short "sri" for contact in flight and perched, and longer "s'r'r'r'r'r" in flight; persistent loud nasal "twink twink twink twink..." in aggressive excitement during territorial disputes, pre-roosting behaviour and at presence of cat in breeding territory; low slow clucking "djük", usually in clusters, in mild alarm, often accelerating into alarm-rattle, a whinny (rising and then falling) in alarm, "djük... djük djük-djükdjük-a-wíítiddli-wíítiddli"; very high, flat, long-drawn, slightly descending "siiiiiiiiii", frequently repeated in breeding season as warning of aerial predator and when ground predator near nest; slightly lower, softer "suiiiiiiii", ascending at start and then even-pitched, by territorial male as signal of aggressive readiness; "puk" or "kop" to warn nestlings of ground predator.
Habitat. Very broad range, from remote mountainous areas to busy city centres. Main and original habitat relatively open broadleaf, coniferous, mixed and deciduous forests (forest presumed original habitat, although high densities in suburban gardens strongly suggest that species adapted to woodland-edge areas, where greatest abundance of berries and variety of terrestrial foraging micro-habitats exist); also tree plantations, orchards including guava, mango, citrus and olive groves, oases, farmland, gardens and parks, commonly in open grassy areas so long as vegetation cover within short distance. Key requirements in human settlements are well-developed shrubbery (often a function of garden size), open spaces and lower housing densities. Seasonal changes by sedentary populations, e.g. greater use of peripheries of villages (orchards, larger gardens) in autumn and of village centres in winter. Comparison of breeding success in woodland and farmland in Britain suggests that latter slightly suboptimal, with higher proportion of young males, and with smaller eggs laid by females, but overall effects difficult to gauge (distribution in both habitats patchy). In Afghanistan, breeds in river valleys with small trees and bushes, visiting orchards, deciduous forests and thickets in winter. In Morocco, reaches 2300 m, rarely 2700 m, in *Oleo–Lentisetum* stands, *Calenduleta–Junipericum* forest and oaks (*Quercus*); requires areas with more than 300 mm rainfall per year. In Turkey mainly 500–2000 m, locally to sea-level in W.
Food and Feeding. Invertebrates, mainly earthworms and insects and their larvae, also fruits and seeds and, occasionally, small vertebrates; highly flexible and adaptive, but cannot survive exclusively on fruit for very long. Insect food includes adult and larval beetles (Coleoptera) of at least 13 families, adult and larval lepidopterans of at least ten families, adult and larval flies (Diptera) of at least nine families, bugs (Hemiptera) of at least six families, adult, larval and pupal hymenopterans (including sawflies, ichneumons, ants, bees and wasps), lacewings (Neuroptera) of at least three families, orthopterans (grasshoppers, mole-crickets, bush-crickets), damselflies (Odonata), earwigs (Dermaptera), cockroaches (Blattodea), mayflies (Ephemeroptera) and springtails (Collembola); other animal food includes spiders, harvestmen (Opiliones), woodlice (Isopoda), centipedes (Chilopoda), millipedes (Diplopoda), pseudoscorpions, small molluscs, earthworms, small fish, newts, small frogs, tadpoles, lizards, small snakes and nestling birds. Plant foods mainly fruits and berries but also seeds, key species being strawberry-tree (*Arbutus*), barberry (*Berberis*), dogwood (*Cornus*), hawthorn (*Crataegus*), strawberry (*Fragaria*), alder buckthorn (*Frangula*), ivy (*Hedera*), juniper (*Juniperus*), privet (*Ligustrum*), honeysuckle (*Lonicera*), apple (*Malus*), olive (*Olea*), pistachio (*Pistacia*), cherries (*Prunus*), pear (*Pyrus*), buckthorn (*Rhamnus*), currant (*Ribes*), rose (*Rosa*), bramble (*Rubus*), elder (*Sambucus*), brier (*Smilax*), nightshade (*Solanum*), rowan (*Sorbus*), snowberry (*Symphoricarpos*), yew (*Taxus*), bilberry (*Vaccinium*), viburnum (*Viburnum*), mistletoe (*Viscum*), vine (*Vitis*) and maize (*Zea*); in China mulberries (*Morus*) and banyan berries (*Ficus*) also reported. Over year, in Britain, five main food resources: (1) earthworms, consumed throughout but particularly in late summer and autumn; (2) leaf-litter invertebrates, also taken all year; (3) caterpillars and adult insects, mainly late spring and early summer; (4) fruit, Jul–Dec and especially Oct–Nov; and (5) human foodstuffs in various forms. On Heligoland (Germany), spring migrants ate 60% invertebrates (mostly snails and beetles) and 40% man-supplied seeds. In winter, S Spain, food largely vegetable (83% by volume), mainly olives and grapes, with 31% of animal biomass contributed by beetles, but with myriapods dominant in Oct and Dec, and larvae of great importance Jan–Feb. In winter, Italy, vegetable food more frequent (60%) than animal food (40%) and was mainly *Pyracantha* (38% of total) and *Ilex* (6%), while animal food was insects (26% of total), worms (6%), millipedes (5%) and spiders (2%); insects composed of beetles (10% of total), bugs (7%), hymenopterans (2%), earwigs (2%), adult and larval lepidopterans (1%), others (4%). In China, stomachs of 94 birds taken over a year in Fujian always held 50–80% invertebrates, very largely insects, with a few snails and worms; insect food mainly larvae of flies, beetles and lepidopterans, also adult beetles and ants, with plant material mainly fruits of *Cinnamomum camphora* and *Ficus wightiana* but also other fruits and grass seeds; in Hunan, autumn and winter, primary food plants, e.g. fruits of *Rubus* and *Cinnamomum*, with animal food mainly fly larvae, mole-crickets and earthworms, along with grasshoppers, dragonflies, lepidopterans, hymenopterans, snails and small frogs. At one site in Britain, nestlings provisioned mainly with earthworms and caterpillars, but in another study caterpillars predominated as nestling food in woodland and earthworms in suburban gardens. In Hungary, recorded nestling food earthworms, adult beetles, caterpillars and flies. In orange groves, E Spain, main food of nestlings was earthworms, *Helix* snails and caterpillars, pupae and imagines of the noctuid moth *Peridroma saucia*, with secondary prey earwigs, grasshoppers, beetles, bugs, ants, myriapods, spiders and fragments of oranges, and prey types more diverse in Apr than later owing to quantitative changes in prey availability; diet of older nestlings more diverse than that of young or mid-aged ones, owing to decrease in proportion of earthworms and increase in lepidopterans and secondary prey. Forages mainly on ground, by turning leaf litter and uprooting moss with sideways flips of the bill; on grass makes short runs with studied pauses, listening and watching for prey, then stabbing or digging at ground to secure it. Commonly feeds also in trees and bushes.
Breeding. Mid-Mar to early Sept in Europe, usually from end Apr in both Finland and former Czechoslovakia; Mar–Jun in Canary Is, Mar–Jul in most of N Africa, but Apr–Sept in Tunisia; end Feb to end Jul in Israel; Apr–Jul in Afghanistan and Mar–Jul in China; Aug–Feb in Australia (introduced); up to three broods per year. Monogamous pair-bond, but divorce rate in one study 19% between seasons and 5% within season; divorce observed in 32% of 183 cases where birds survived from previous season, and most frequent in low-quality nesting habitat. Solitary, but nests sometimes as close as 10 m where population density very high; territorial. Nest a large cup of dry grass stems and small twigs, packed with mud and lined with fine grass and stems, placed 0·5–15 m off ground in bush or tree or in climbing plant against wall, and frequently in or on wall, outside or inside building; in former Czechoslovakia, 78% of sites in trees and shrubs, 22% in human artefacts, mean height 1·9 m and 94% below 4 m (similar results from Poland); in Tunisian oases nests commonly low in pomegranate (*Punica granatum*). Eggs 2–6, usually 3–4, pale greenish-blue with pale reddish-brown spots; incubation period 10–19 days, average 13 days; nestling period 13–14 days; post-fledging dependence c. 20 days. Success generally low in urban areas, higher in rural habitats where disturbance levels and numbers of domestic cats lower, but recruitment in urban parks in Spain associated with size of park, shrub cover and height (although human disturbance levels negative); where Common Magpie (*Pica pica*) densities high, predation can be severe and recruitment depressed below replacement rates; in general, failure rate during incubation significantly greater where corvids more abundant, and in many studies degree of nest concealment correlated with fledging success; of 1428 nests in Britain, one young hatched in 56% and at least one young fledged in 41%; of 6664 eggs laid in 1601 nests in Czechoslovakia, 35·7% lost before fledging; many nests lost to Eurasian Jays (*Garrulus glandarius*) in Israel and to snakes and children in S Tunisia. Breeds at 1 year; peak reproductive potential in fourth calendar year (clutch size and season length increase with age). Annual adult mortality 44% in Britain, 46% in Belgium (deliberate killing excluded from latter sample), apparent bias in survival towards males (in one study in Britain, male mortality 41%, female 66%), and urban birds (both sexes) suffer lower mortality rates than those in country; annual juvenile mortality in Britain 59% in one study, 58% (analysis 1st Aug to 31st Jul) in another, but in former Czechoslovakia 68%. Causes of mortality of ringed birds in NW Europe are domestic predator 31%, human-related (accidental) 44%, human-related (deliberate) 6%, other 19%.
Movements. Sedentary, partially migratory and fully migratory, depending mainly on latitude. In N Europe, nominate race partly migratory, leaving breeding grounds late Sept, main passage Oct and early Nov (similar dates for birds on same latitudes in Russia), estimated minimum migrant fractions 16% (Denmark), 61% (Norway), 76% (Sweden) and 89% (Finland), with respectively 47%, 75%, 40% and 25% of migrants from these countries moving to Britain and Ireland (others in more S direction to Netherlands, Belgium, NW France); most such migrants female, and probably many young. Those in parts of W & C Europe may be 75% resident, remainder shifting S (some British birds W into Ireland); birds from Germany, Poland, Czech Republic, Slovakia, Switzerland and Hungary winter mainly in C & W France, Iberia and N Italy. Russian birds judged to move SW, entering Belarus Aug–Oct, but SE Kazakhstan not vacated until Dec, with concomitant swelling of numbers in Turkey in winter. Race *mauritanicus* largely resident, but evidence of some S dispersal in winter, and numbers augmented by immigrant nominate race Oct–Apr. Race *aterrimus* largely sedentary, but some winter in Cyprus and Egypt (latter Oct to mid-Apr), and *syriacus* also present in Egypt (Mediterranean coast) Nov–Mar. Passage and winter visitor (presumably last two races) mid-Oct to early Apr in Israel, where some movement to lower altitudes by residents in mid-winter. Spring return commences late Feb, with main passage of Scandinavian breeders through W Europe

On following pages: 39. Tibetan Blackbird (*Turdus maximus*); 40. Indian Blackbird (*Turdus simillimus*); 41. Grey-winged Blackbird (*Turdus boulboul*); 42. Ring Ouzel (*Turdus torquatus*).

Mar and early Apr, arriving C Sweden late Apr and equivalent latitudes in Russia early May; passage in France appears to show two peaks, one in late Feb and other in mid-Mar, but unclear whether two different breeding populations, two age-classes or different sexes. Chinese populations (races *sowerbyi* and *mandarinus*) apparently partially migratory, some wintering S of breeding range; present around Hong Kong in winter mainly mid-Nov to Mar, with peak numbers mid-Nov to early Dec, and a scarce to common winter visitor to Laos and N Vietnam, singly or in small groups. Vagrants recorded W to Greenland and NE North America, E to Japan and Ryukyu Is, and S to N Indian Subcontinent and Thailand; occasional records in E Saudi Arabia and N Libya involve mostly first-year males, suggesting perhaps pioneering (perhaps enforced) dispersal in late winter.

Status and Conservation. Not globally threatened. Generally common to abundant. Rather scarce breeder S Tunisia, common in N; abundant in Israel following major expansion of range and numbers since 1940s (attributable in part to development of settlements, gardens and orchards), with total population at least a few hundred thousand pairs (including 1000 pairs in 68 km² of Jerusalem); common in W & S Turkey, sparse and local or absent elsewhere; common in Armenia; sparse in Afghanistan. Common in China, where also a common winter visitor and passage migrant in Hong Kong. Total population in Europe in mid-1990s estimated at 37,663,943–54,585,469 pairs, with additional 10,000–100,000 pairs in Russia and 100,000–1,000,000 pairs in Turkey; at that time Spain estimated to hold 2,300,000–5,900,000 pairs, but recently minimum population calculated as 735,232 pairs. By 2000, total European population (including European Russia and Turkey) revised to 40,000,000–82,000,000 pairs and considered generally stable. Colonization of European towns began in 1850s; reached Shetland (UK) c. 1880; colonization of Egypt began mid-1970s, and now well established in N; colonization of cities in C Asia also relatively recent. Densities in small urban parks in W Europe are highest recorded, with exceptionally 4 pairs/ha (400 pairs/km²) locally, normally 1·5–2·5 pairs/ha, while in rural areas 0·03–0·1 pair/ha (3–10 pairs/km²) normal. Decline in British population of c. 30% since 1970s, possibly owing to agricultural intensification, as decreases greater on farmland; decline in Netherlands possibly result of lower breeding success. Hunting in Cantabrian Mts, in Spain, may explain relatively low densities there. Hazards for survival in W Palearctic include predators, disturbance, adverse weather conditions, nest collapse and starvation. Australian populations have grown and spread from coast-city introductions between 1850 and 1890 and introduction on Tasmania in early 1900s; populations on Lord Howe I and Norfolk Is (where now very common, first seen c. 1920) came in part from New Zealand, but some may be self-introduced, as may be those on Macquarie I; also well established on some of Kermadec Is.

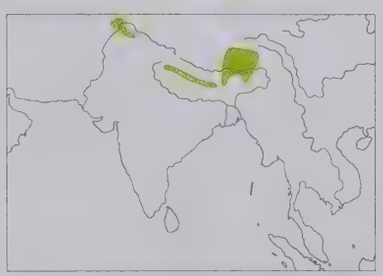
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39. Tibetan Blackbird

Turdus maximus

French: Merle de l'Himalaya **German**: Tibetamsel **Spanish**: Mirlo del Himalaya

Taxonomy. *Merula maxima* Seebohm, 1881, Kashmir.
Formerly treated as a race of *T. merula*, but differs in several characters, most notably song. Supposed E race *buddae* based only on shorter bill length, but this not constant. Monotypic.
Distribution. Himalayas from N Pakistan E to Nepal, and SE Tibet.



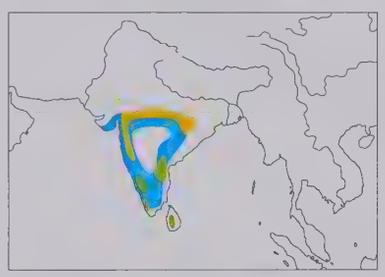
Descriptive notes. 23–28 cm. Both sexes may have subtle hooded appearance. Male is brownish-black, with stronger black head, breast, wings and tail; bill dull orange-yellow; legs dark. Differs from *T. merula* in lack of yellow eyering. Female is blackish-brown above, browner below, faint throat streaks; bill dusky yellowish. Juvenile is like female, but mottled greyish-buff from back to wing-coverts and rump, streaked greyish-buff on throat, barred greyish-buff on belly to vent. Voice. Song, from ridgetop, rock or, if available, tree, a series of phrases composed of rapid metallic notes, unpleasant squeaks, wheezy sounds like those of a drongo (*Dicrurus*) and guttural caws, with occasional pure whistle (e.g. mournful "piew-piew"), very repetitious and without warbling phrasing of *T. merula*. Calls reportedly include low "chut-ut-ut", harsh staccato "chak-chak-chak-chak" in flight, and rattling but slightly slower "chow-jow-jow-jow" alarm.
Habitat. Highly adapted to subalpine environment. Breeds in bushy patches of dwarf juniper (*Juniperus*) and rhododendron scrub on steep grassy, rocky slopes and alpine meadows just above tree-line, at 3200–4800 m; winters in shrubs and juniper at lower levels, usually not below 3000 m.
Food and Feeding. Earthworms (in Hazara, Pakistan, a very short-bodied dark red species), molluscs, insects including caterpillars, small lizards, fruits, berries and seeds. Small worms seen brought to nestlings. Forages on ground, hopping agilely over rocks and boulders; favours soft bare ground at edges of melting snow. In late summer, forages in small parties of up to ten individuals.
Breeding. May–Jul, mostly Jun to early Jul; in Tibet, peak laying mid-May to mid-Jun. Nest a bulky but compact cup with some mud, lined with animal hair and finer grass, placed on ground amid roots, at foot of boulder, in low bush or on cliff face; in China, *Cotoneaster microphyllus* the preferred plant for nest, and a few nests placed against rocky wall. Eggs 3–4, large, dull buff to grey with large warm brown blotches; in China, incubation period 12–13 days, nestling period 16–18 days. Success 59% in study in China.
Movements. Descends to slightly lower elevations in winter.
Status and Conservation. Not globally threatened. Patchily scarce to frequent in N Pakistan; locally common in Kashmir; very sparse in E of range. Reports from Sikkim unconfirmed. In study in China, density found to be 0·07 pairs/ha.
Bibliography. Ali (1977), Ali & Ripley (1987b), Bates & Lowther (1952), Clement & Hathway (2000), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Rasmussen & Anderton (2005), Roberts (1992), Vaurie (1955c), Xin Lu (2005).

40. Indian Blackbird

Turdus simillimus

French: Merle des Nilgiri **German**: Indienamsel **Spanish**: Mirlo Indio
Other common names: Nilgiri Blackbird (nominate)

Taxonomy. *Turdus simillimus* Jerdon, 1839, Avalanche, higher southern Nilgiri Plateau, India.
Usually treated as race of *T. merula*, but differs markedly in plumage, proportions, wing formula, vocalizations and egg colour; arguably, is closer to *T. poliocephalus*. Race *kinnisii* may better be treated as a separate species. Race *nigropileus* sometimes referred to as *mahrattensis*, but former has priority. Birds from E India described as race *spencei*, but indistinguishable from *nigropileus*. Four subspecies recognized.
Subspecies and Distribution.
T. s. nigropileus (Lafresnaye, 1840) – W, C & SE India.
T. s. simillimus Jerdon, 1839 – SW India.
T. s. bourdilloni (Seebohm, 1881) – S India.
T. s. kinnisii (Kelaart, 1851) – Sri Lanka.



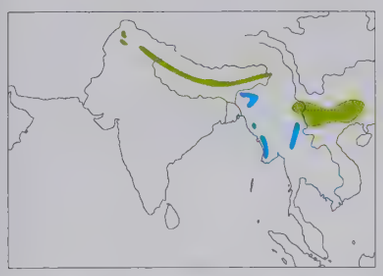
Descriptive notes. 19–22 cm; 60–94 g. Male nominate race is dark grey-brown above, darkest on crown (slight capped appearance), slightly paler greyish-brown below, palest on throat and mid-belly, with orange-yellow bill, eyering and legs. Differs from *T. merula* mainly in paler plumage, smaller size. Female is paler overall, throat slightly streaked. Juvenile is like female above, but with orangey-buff tips of wing-coverts, orangey-buff with dark brown scaling and mottling below. Race *nigropileus* is paler than nominate, male with blackish head and paler grey-brown collar, lower underparts paler; *bourdilloni* male is uniform slate-brown with paler edges of primaries; *kinnisii* is smallest, greyish-slate with vague bluish tinge and dark-scaled upperparts, female similar but rather duller. Voice. Song a rapid series of rich, varied, short, slurred and usually paired notes; simpler in Sri Lanka (race *kinnisii*), where subsong also reported. Calls include a rapid hard rattle and a lower-intensity version, and a slower series of percussive musical notes; short, high ascending trill in Sri Lanka.
Habitat. Breeds in moist deciduous and evergreen broadleaf forest, sholas, wooded ravines, dense scrub-jungle, scrubby woodland edge, groves, copses, shade coffee plantations, in hills above 700 m in India, above 900 m in Sri Lanka; winters down to plains, in similar habitat and also wooded gardens and plantations.
Food and Feeding. Invertebrates and fruits of forest. Forages on ground, where seen to peck at dung beside forest track; also feeds in fruiting and flowering trees.
Breeding. Feb–Nov in India; Mar–Apr and Aug–Sept in Sri Lanka. Nest a deep bulky cup of grass, moss and roots, strengthened with a few twigs and a mud layer, and with inner lining of fine roots, placed in tree fork, stump or bush. Eggs 4, bluish to pale green, very glossy, with bold reddish-brown and light umber speckles. No other information.
Movements. All populations make seasonal movements to lower levels; race *nigropileus* also undertakes short-distance migrations into range of other races.
Status and Conservation. Not globally threatened. Common throughout range.
Bibliography. Ali & Ripley (1987b), Clement & Hathway (2000), Grimmett et al. (1998), Harrison (1999), Henry (1998b), Hoffmann (1998), Kannan (1998), Legge (1983), Rasmussen & Anderton (2005).

41. Grey-winged Blackbird

Turdus boulboul

French: Merle à ailes grises **German**: Bülbülamsel **Spanish**: Mirlo Aligrís

Taxonomy. *Lanius boulboul* Latham, 1790, Darjeeling, India.
Monotypic.
Distribution. Himalayas, S China and N Indochina; non-breeding also in Myanmar and NW Thailand.
Descriptive notes. 27–29 cm; 85–105 g. Male is black, with broad pinkish-grey wingpanel, whitish-tipped wing-coverts, vague greyish scaling on lower underparts; yellow bill and narrow eyering; yellowish-brown legs. Female is pale olive-brown, warm brown wing-coverts with broad pinkish-buff tips. Juvenile is dark brown with buff spots and streaks above, buff-brown with narrow dark bars below, plain wingpanel greyer on male, buffier on female. Voice. Song, from treetop or isolated tree in clearing, a rich, loud, melodious series of relaxed phrases, each often ending with



twitter, recalling *T. merula* but more disjunct, "twii-tuuu twii-tuuu chuiyui-twit wiiar-twit wiiar-trtrtrt-wi-wi-wich wiiyar-wiiyar..."; small isolated population in Malkandi (Pakistan) has much more limited repertoire. Calls reportedly include low "chuk-chuk" (stronger in alarm), "churi" in contact, angry "churr" near nest, and mournful downward-inflected "pie-oooh tie-ooh" whistle when going to roost.

Habitat. Breeds in diverse humid oak (*Quercus*) and other broadleaf evergreen forests (with *Castanopsis*, *Ulmus*, *Magnolia*, *Alnus*, *Rhododendron*, *Aesculus*, *Populus*, *Sorbus*, etc.), at 1800–2700 m in Himalayas (upper limit coinciding with upper limit of *Q. semecarpifolia*); winters in open forest, secondary and bush jungle, dry scrub, clearings, forest edge and around villages, from foothills to 2600 m. Elevation 640–3000 m in China (lower in winter), 1000–2500 m in SE Asia. In Pakistan typically associated with ban oak (*Q. incana*).

Food and Feeding. Insects, including a high proportion of larvae, ground-feeding caterpillars, also snails, slugs, earthworms and fruits; berries, especially *Cotoneaster* and *Berberis*. Often an arboreal feeder, seeking invertebrates in moss on boughs; equally forages on ground in typical turdine manner, with rapid hops and pauses. Often in small flocks in winter.

Breeding. Mar–Aug, mainly Apr–Jul; often double-brooded, at least at lower elevations. Nest a flimsy or bulky, sometimes mud-lined cup, decorated externally with moss and lichen and lined with hair, fern stems and fine rootlets, usually on branch close to main stem 2–5 m up in tree, sometimes on ground among roots or rocks. Eggs 2–4, pale greenish to yellowish-stone with dull reddish-brown blotches and streaks. No other information.

Movements. Mainly resident, but makes seasonal vertical movements. Sometimes disperses through adjacent plains, and undertakes short-distance migrations, e.g. a winter visitor to S Myanmar and NW Thailand (few each winter); status uncertain in N Myanmar. In Pakistan, straggles down to foothills and adjacent well-wooded plains, forming loose flocks Dec–Mar.

Status and Conservation. Not globally threatened. Locally common in Pakistan and throughout much of breeding range; rare in China; uncommon resident in N Laos and N Vietnam. In Pakistan, 4–5 singing males in area of c. 30 ha, suggesting at least 1 pair/6–7·5 ha (13–17 pairs/km²).

Bibliography. Ali (1977), Ali & Ripley (1987b), Cheng Tsohsin (1987), Clement & Hathway (2000), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inglis (1945), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Wunderlich (1989).

42. **Ring Ouzel**

Turdus torquatus

French: Merle à plastron **German**: Ringdrossel **Spanish**: Mirlo Capiblanco

Taxonomy. *Turdus torquatus* Linnaeus, 1758, Sweden.

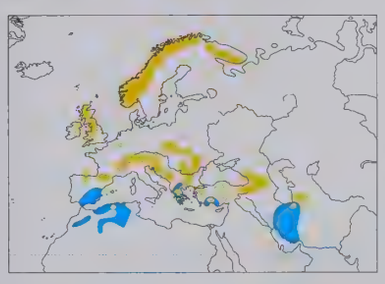
Three subspecies recognized.

Subspecies and Distribution.

T. t. torquatus Linnaeus, 1758 – Ireland, W Britain, NW France, W & N Scandinavia and NW Russia; non-breeding S Europe and NW Africa.

T. t. alpestris (C. L. Brehm, 1831) – N Spain and C Europe E to Balkans, Greece and W Asia Minor, also N Africa (possibly Algeria); non-breeding also N Africa, SE Europe and S Turkey.

T. t. amicorum Hartert, 1923 – C & E Turkey, Caucasus area, N Iran and SW Turkmenistan; non-breeding also N Africa and C & S Iran.



Descriptive notes. 23–24 cm; 90–138 g. Male nominate race is all black except for bold white crescent-shaped breastband, narrow greyish scaling (sometimes absent above) on mantle, scapulars, belly and flanks, pale whitish-grey edges of flight-feathers and wing-coverts; bill yellow; legs grey-brown. Female is like male, but browner on head to scapulars and throat, narrower and less distinct whitish breastband. Juvenile is like female, but with grey-buff streaks above, whitish chin and mid-throat, no breastband or only faint one. Race *alpestris* has broader white scalloping below, can appear heavily scaled; *amicorum* has larger breastband, and whitish panel in wing formed by broader edges and tips of feathers. Voice. Song, by male from elevated perch (or even heather clump) and sometimes in display-flight, a series of slightly varied phrases consisting of 2–4 simple fluty melancholy notes, e.g. "pi-rií, pi-rií, pi-rií" and "trruu-trruu-trruu tjii-tjii-tjii", at start of breeding season sometimes interspersed with chuckling and warbling sounds. Subsong a quiet series of piping and chuckling notes. Calls include characteristic loud "tac-tac-tac" in mild agitation, becoming harsher "chrech-rech-rech-rechra" in alarm; softer "tjuck-tjuck-tjuck" on ground or when taking wing (when sometimes also "dcherrr" or "tschwierrr"); also chuckling "tchuuk-tchuuk-tchuuk" in migrating flocks, "zrrp" or "tsierk" (sometimes doubled) in flight, and thin high "ssii" as warning of aerial predator.

Habitat. Mountain steppe with conifers, including wet spruce (*Picea*) and spruce–fir woodland (*P. abies–Abies alba*), in C Europe also conifer–beech (*Fagus*), extending into bushy scrub with *Rhododendron hirsutum* and *Pinus mugo* in alpine regions, dry rugged upland slopes, heath and heather moorland with bracken, stones and grass patches, subalpine meadows with scattered shrubs and trees, low shrubbery above tree-line on rocky slopes. Preference for heather–grass mosaics and *Nardus–Molinia* grassland in Britain, where most nesting territories contain small crags, gulleys, scree and/or boulders, as well as sloping or flat areas with short vegetation and scattered trees or bushes. Outlying population in Belgium (Hautes-Fagnes plateau) uses young spruce stands on weak slopes away from S aspects. In Armenia and Caucasus, occupies upper levels of conifer stands, rhododendron thickets, juniper (*Juniperus*) scrub and shrubs on steep rocky ground. In NW Africa winters abundantly in juniper forest (*J. phoenicea* and *J. thurifera*) at 1800–2200 m, very often near rivers or waterholes. On migration in Britain, frequents steep chalk hillsides with unimproved herb-rich short grass and patchy scrub, commonly also coastal grassland. Sea-level to 1200 m in N Europe, 600–2000 m in C Europe; in Turkey generally 1300–3000 m; generally 1200–2700 m in N Africa in winter.

Food and Feeding. Invertebrates, seeds, fruits. Foods include adult and larval beetles (Coleoptera) of at least 13 species, adult and larval flies (Diptera) of at least three families, grasshoppers (Orthoptera), earwigs (Dermaptera), moths, butterflies, caterpillars, bugs, hymenopterans (ants, sawflies), spiders, millipedes (Diplopoda), small snails, slugs, small lizards, salamanders; also, mostly in autumn and winter, fruits of bramble (*Rubus*), strawberry (*Fragaria*), cherry (*Prunus*), hawthorn (*Crataegus*), rowan (*Sorbus*), elder (*Sambucus*), currant (*Ribes*), buckthorn (*Rhamnus*), alder buckthorn (*Frangula*), viburnum (*Viburnum*), mistletoe (*Viscum*), ivy (*Hedera*), bilberry (*Vaccinium*), crowberry (*Empetrum*), lantana (*Lantana*), juniper, vine (*Vitis*) and olive (*Olea*). In spring and early summer, in Europe, mainly earthworms and adult and larval insects, shifting in rest of year to fruits. In Ukraine, eats mainly fly larvae, beetle adults and larvae, and caterpillars in spring; in summer adult beetles comprise 70% of diet, along with earthworms, millipedes and occasional lizards; in autumn plant material dominates. Earthworms dominate nestling diet in Britain, although other foods provided include beetles and their larvae, tipulid larvae, ants, sawflies and their larvae, spiders, caterpillars and millipedes; in Romania, 924 items brought to nestlings comprised by weight 42% lepidopterans (mostly caterpillars), 29% earthworms, 24% beetles (mostly adults), 4% hymenopterans (largely ants) and 1% others. On migration in Britain, birds on short grass fed in spring in short runs and pecks, never probing for worms, apparently on abundant spiders and flies; in autumn in same habitat, fed almost entirely on berries, notably elderberries (*Sambucus nigra*), then haws, and occasionally white bryony (*Bryonia dioica*) and blackberries (*Rubus fruticosus*). In SE Spain, Oct–Mar, eats mainly juniper berries (small proportion also of *Berberis vulgaris* in early winter), vegetable matter forming more than 90% of diet throughout, but also some beetles and *Iulus* millipedes and, occasionally, grasshoppers, flies, ants and insect larvae; similarly, wintering birds in Algeria eat mainly juniper berries; consumes other fruits in areas of Spain and N Africa where junipers absent or few.

Breeding. Mid-Apr to mid-Jul in British Is and Alps; in Scandinavia, early May to end Jun in S and late May to early Aug in N; sometimes double-brooded, this probably usual in S of range. Solitary nester, in many areas territories tend to be linearly distributed along watercourses; nests generally well spaced, in closest-packed situations 160–200 m apart, generally with some overlap in home ranges, which in one British study ranged from 1·7 ha to 9·8 ha (mean 5·3 ha). Nest a bulky cup of dry grass, stems, moss and leaves mixed with mud, lined with dry grass, placed on ground or 1–16 m (average 3·5 m) up in shrub or small tree; of 297 sites in Britain, 9% on ground, 36% below 45 cm in vegetation, 4% at 45–90 cm in vegetation and 2% up to 3 m off ground in tree, 26 nests in Poland all close to trunk in tree at average height 3·5 m (range 1–16) m. Eggs 3–6, mainly 4–5, pale blue to greenish-blue with small pale reddish-brown blotches; incubation period 13–14 days; nestling period 14–16 days; post-fledging dependence 12 days, sometimes longer. Breeding success at one low-density site in Bavarian Alps only 40%; of 79 clutches in Britain, 24 lost before hatching to predation and desertion; of 183 eggs in Romania, 5% addled, 5% preyed on by squirrels (*Sciurus vulgaris*) and Eurasian Nutcracker (*Nucifraga caryocatactes*), of resulting 164 nestlings 79% hatched and 21% lost to same predators. Breeds at 1 year. Causes of mortality of ringed individuals in NW Europe are natural predator 9%, human-related (accidental) 10%, human-related (deliberate, mainly hunters in France) 77%, other 4%.

Movements. Migratory. British and N European breeders (nominate race) appear to winter mainly in S Spain and NW Africa; departure from breeding areas Sept, passage of Scandinavian birds in N Germany mid-Sept to Oct, reaching NW Africa from mid-Oct but main arrival from mid-Nov. Spring vacation of Africa Mar–Apr, Scandinavian birds taking more W route than in autumn; arrival in Britain from mid-Mar, Norway Apr–May, but peak passage N Scotland (Shetland) in May, males 10 days ahead of females. Race *alpestris* moves to higher elevations immediately after breeding; subsequently, W populations tend to move initially W or SW, passing through Swiss Alps, where nominate passes c. 2 weeks later than local *alpestris* and with lower weight but higher fat reserves (suggesting rapid onward, possibly leapfrogging, movement); C European *alpestris* then winter S to S parts of breeding range or move into Mediterranean Basin, including NW Africa. E populations of *alpestris* appear to move SE to Balkan Peninsula, with passage at Bosphorus (W Turkey) late Aug to Oct, mainly late Sept to early Oct; present Cyprus Oct–Mar but peak numbers Nov, suggesting onward movement. Arrives back in W Alps mid-Mar to mid-Apr, with similar schedule in Ukraine. Race *amicorum* leaves breeding grounds late Sept and Oct, but winter records relatively sparse and diffuse, Oct–Feb in Libya, late Oct to early Dec in Egypt, Nov–Mar in Gulf states, with arrival back in N Caucasus early Mar to early Apr, steadily ascending mountains as snow melts. Rare passage migrant (presumably *amicorum* and/or *alpestris*) in Israel, mainly Nov and mid-Feb to mid-Mar. Vagrants recorded W to Iceland and Canary Is and S to C Libya and Oman.

Status and Conservation. Not globally threatened. Locally common. Total population in Europe in mid–1990s estimated at 247,032–355,281 pairs, with additional 1000–10,000 pairs in Turkey and 10–100 pairs in Russia. By 2000, total European population (including European Russia and Turkey) revised to 310,000–670,000 pairs and considered generally stable. Optimal density in Alps 60–80 pairs/km² but generally much lower (e.g. 37 pairs/km² in Haute-Savoie); 22 pairs/km² in Jura Mts and 20–30 pairs/km² in Ukraine; in more open habitats in Britain 8 pairs/km² declining to 1·3 pairs/km², but in optimal habitat density of 0·34 pairs/ha (34 pairs/km²) can occur. In most of European range stable or decreasing, with a few minor local increases. Causes of declines unknown, but increased human disturbance (development of many upland areas for outdoor leisure pursuits), competition with large congeners (*T. merula*, *T. viscivorus*, *T. pilaris*) and climatic change have been suggested, although habitat alteration most likely. Widespread loss of juniper forest in S Spain and NW Africa may be partly responsible for decline in British breeding population, but recent analysis suggests that large-scale afforestation in uplands (where population in 1999 estimated at 6157–7549 territories) may be a negative influence; of standard areas (2 × 2 km) known to be occupied in 1988–1991, 39–43% were unoccupied in 1999. Hunting of NW European migrants passing through S Europe may also be significant.

Bibliography. Anon. (2004e), Adamian & Klem (1997, 1999), Appleyard (1994), Arthur & White (2001, 2003), Arthur *et al.* (2000), Aymí (1989), Baumgart *et al.* (1995), Beaman & Madge (1998), Buchanan *et al.* (2003), Bundy (1976), Burfield (2002a, 2002b), Clement & Hathway (2000), Cramp (1988), Dementiev *et al.* (1968), Dunn (1994), Durman (1976), Étchécopar & Hüe (1964), Flegg & Glue (1975), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Gámez (2003), Glutz von Blotzheim & Bauer (1988), Goodman & Meininger (1989), Green (1998), Gubitz & Spath (2002), Hagemeijer & Blair (1997), Haworth & Thompson (1990), Heim de Balsac (1931), Hollom *et al.* (1988), Holupirek (1977), Hope Jones (1979), Hüe & Étchécopar (1970), Hurford (1996), Isenmann & Moali (2000), Janiga (1992), Jenni (1994), Jones (1996), Jones & Donovan (1996), Kasparek (1992), Knolle *et al.* (1973), Korodi Gál (1970), Ledant *et al.* (1981), Leverton (1993), Niethammer (1955a), Nightingale & Hill (1993), Oberwalder *et al.* (2002), Paz (1987), Porter *et al.* (1996), Poxton (1986, 1987), Rasmussen & Anderton (2005), Ratcliffe (1990), Rebecca (2001), Roselaar (1995), Ryall & Green (1994), Schmitz & Michel (2000), Shirihai (1996), Sim & Rebecca (2003), Simms (1978), Slotta-Bachmayr & Winding (1994), Thévenot *et al.* (2003), Tyler & Green (1994), Urban *et al.* (1997), Vaurie (1972), Walter (1995), Watson (1972), Wildash (1968), Wotton *et al.* (1999), Zamora (1990a).

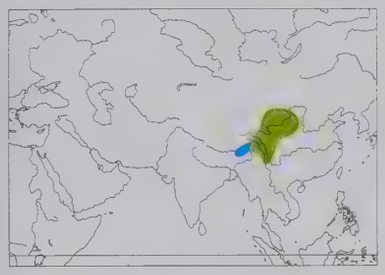

inches
4
cm
10
43
44
45
46
♂
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ssp rubrocanus
ssp gouldi
ssp poliocephalus
ssp niveiceps
ssp albifrons
ssp thomassoni
ssp xanthopus
ssp fumidus
ssp ruficeps
ssp samoensis
ssp erythropleurus
ssp mindorensis
ssp nigrorum
ssp malindangensis
ssp javanicus
ssp seebohmi

43. White-backed Thrush

Turdus kessleri

French: Merle de Kessler **German**: Rhododendrondrossel **Spanish**: Zorzal de Kessler
Other common names: Kessler's Thrush, Przevalski's Thrush

Taxonomy. *Merula Kessleri* Przevalski, 1876, Gansu, China.
Monotypic.
Distribution. E & NE Tibetan Plateau (E Qinghai and SW Gansu S to N Yunnan); non-breeding also SE Xizang.



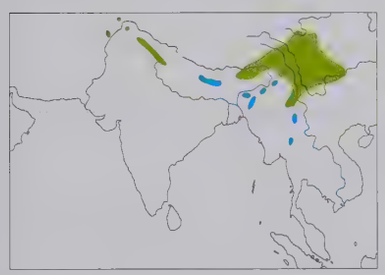
Descriptive notes. 28 cm. Male has black hood to mid-breast and upper mantle, pinkish-buff lower mantle to back, clear-cut pinkish-tinged chestnut scapulars, lower back and rump, black wings and tail; pinkish-buff breastband, rest of underparts pinkish-chestnut, darker and pink-tipped vent; eyering yellow, bill yellow; legs brownish. Female is similar in pattern but washed out, hood brownish, mantle and scapulars greyer, dark-streaked dull buffish submoustachial stripe and throat, underparts paler, bill duller. Juvenile is like female but even more weakly marked, with buff streaks on head and scapulars. VOICE. Song a leisurely series of short mewing and squawking phrases, recalling *T. viscivorus*. Calls include short rapid nasal rattle like bleat of sheep, soft "dug dug" and loud harsh chuckles.
Habitat. Rocky scrub and dwarf bushes such as rhododendron and juniper (*Juniperus*) on mountain slopes above tree-line, at 3600–4500 m, descending to fields as low as 2100 m in winter; descends also in summer at mid-day and night to rest or roost in crowns of pine (*Pinus*) or juniper. Winter vagrants in Himalayas (2700–4300 m) occupy open shrubby vegetation, including juniper scrub, *Berberis*, orchards and potato fields.
Food and Feeding. Insects and worms in summer; berries in autumn, mainly berries of *Juniperus squamata* in winter. Forages largely on ground. Gregarious; often in flocks, including with other thrush species.
Breeding. Early or mid-May to early Aug; apparently single-brooded. Sociable when nesting, recalling *T. pilaris*; males form foraging flocks while females incubating. Nest a cup of grass stems, lined with hair and feathers, placed in dry bush or dwarf rhododendron or low under jutting rock over streambed. Eggs 3–4. No other information.
Movements. Sedentary in many areas; elsewhere a semi-nomadic winter migrant, moving to lower areas at and below tree-line in extremely cold weather. Vagrant in Himalayas from C Nepal E to Bhutan.
Status and Conservation. Not globally threatened. Generally considered rather rare. Rare to locally common in W of range.
Bibliography. Ali (1977), Ali & Ripley (1987b), Cheng Tsohsin (1987), Clement & Hathway (2000), Dornberger & Barthel (1997), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Jepson (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Schäfer (1938), Vaurie (1972), Wunderlich (1987), Zheng Guangmei & Zhang Cizu (2002).

44. Chestnut Thrush

Turdus rubrocanus

French: Merle à tête grise **German**: Kastaniendrossel **Spanish**: Zorzal Castaño
Other common names: Grey-headed Thrush

Taxonomy. *Turdus rubrocanus* G. R. Gray, 1846, Nepal.
Two subspecies recognized.
Subspecies and Distribution.
T. r. rubrocanus G. R. Gray, 1846 – extreme E Afghanistan and NW Himalayas; non-breeding N & NE Indian Subcontinent.
T. r. gouldi (J. Verreaux, 1870) – E & NE Tibetan Plateau E to C China and N & W Yunnan; non-breeding Myanmar and NW Thailand.



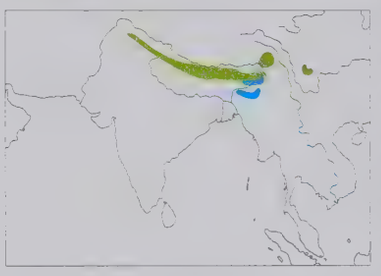
Descriptive notes. 25–28 cm; 85–100 g. Male has orange-chestnut body with black wings and tail, clear-cut whitish hood shading on neck side to ash-grey on head (clear-cut at nape), white-lined blackish vent; eyering yellow, bill and legs yellow. Female is very similar but duller, paler and slightly darker-headed, with browner wings and tail. Juvenile is darker-headed, shading to dull rufous dorsally, with orange-spotted scapulars, dark wings and tail, whitish chin and throat, dark-spotted malar leading to extensively spotted buff-brown underparts. Race *gouldi* has dark grey hood. VOICE. Song, by male from high exposed perch, mainly at dawn and dusk for short periods, a leisurely series of loud rich musical phrases of 3–8 repeated notes, with much mimicry, "yii-bre yii-bre yii-bre… diddyit diddyit… yip-bru yip-bru yip-bru…", thus recalling both *T. merula* and *T. philomelos*. Calls include dry staccato rattle, harsh deep "chuck-chuck-chuck", and high rapid "kwik-kwik, kwik-kwik" in alarm.
Habitat. Breeds in moist conifer and mixed conifer–broadleaf evergreen forest, including deodar (*Cedrus deodara*), fir (*Abies*), horse-chestnut (*Aesculus*) and brown oak (*Quercus semicarpifolia*) forests, with well-developed ground cover; avoids inner, drier, sparser tracts with sparse understorey, keeps to shadier areas (thus often syntopic in Pakistan with *Zoothera dauma*). At 1500–3300 m in Himalayas, wintering lower, down to 450 m, in open woodland and orchards; 900–2500 m, rarely down to 200 m, in winter in SE Asia. In Pakistan judged to be higher altitudinal replacement for *T. boulboul*.
Food and Feeding. Insects and their larvae, worms, millipedes (Diplopoda), slugs, snails and berries; probably more dependent on berries in winter, but seen to feed on ripening berries of *Viburnum nervosum* in Jul. Forages mainly on ground in thickets and forest, in summer keeping well inside undergrowth and thickets, but often in trees. Frequently in small flocks and often with other thrush species in winter.
Breeding. Apr–Aug. Nest a thin cup of twigs, grasses, roots and moss with or without mud support, lined with grass, roots, hair and/or pine needles, placed on ground in exposed bank under tree roots, or low (3–4 m up) in sapling, in tree (e.g. *Abies webbiana*) or in hollow of tree or low cliff. Eggs 2–4, greenish with brownish spots and patches. Young recorded as eaten by snake. No other information.
Movements. Himalayan breeders undertake altitudinal migration, also short-distance E migrations into Nepal, relatively few reaching Assam; some stay in N Pakistan, where at lower elevations Dec–Mar. Resident or partial migrant in China. Irruptive visitor in Thailand, where generally rare. Vagrant in Laos and N Vietnam.
Status and Conservation. Not globally threatened. Locally common in Pakistan; common in China. In Myanmar, common in higher hills along frontier with Yunnan (China), possibly breeds. Otherwise, scarce to uncommon winter visitor Myanmar and NW Thailand.
Bibliography. Ali (1977), Ali & Ripley (1987b), Bates & Lowther (1952), Cheng Tsohsin (1987), Clement & Hathway (2000), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Vaurie (1972), Zheng Guangmei & Zhang Cizu (2002).

45. White-collared Thrush

Turdus albocinctus

French: Merle à collier blanc **German**: Weißhalsdrossel **Spanish**: Mirlo Acollarado
Other common names: White-collared Blackbird

Taxonomy. *T.(urdus) albocinctus* Royle, 1840, Dehra Dun, Himalayas, India.
Monotypic.
Distribution. Himalayas from N India E to S China (S & SE Xizang, SW Sichuan); non-breeding also NE India.



Descriptive notes. 26–28 cm; 96–105 g. Male is black, with very broad white collar extending from chin to mid-breast and around lower nape and upper mantle; thin whitish lines and bars on undertail-coverts; eyering yellow, bill yellow; legs yellowish-brown. Female mirrors male pattern but variable, upperparts generally brown (head darker), underparts slightly paler, collar greyish-white or buffish-white. Juvenile is dark brown with extensive russet-buff spotting and streaking above, russet-buff with dark brown mottling and barring below. VOICE. Song, from treetop in twilight at dawn and dusk, a series of long phrases (repeated 5–7 times per minute) consisting of simple abrupt sad, mellow, descending whistles, "tiu-i tiu-u tiu-o" and so on, sometimes varied with "tiu-iio" and with occasional hissing and squeaking notes; strongly recalls song of *T. philomelos*. Calls include throaty "tuck-tuck-tuck…" or "chack-chack".
Habitat. Breeds along edges and in glades mainly in lower reaches of conifer zone (mainly fir *Abies*), spruce–birch (*Picea–Betula*), locally in oak and rhododendron forest (*Quercus*, *Magnolia*, *Lithocarpus*) with rich undergrowth, dwarf rhododendron at tree-line, at 2100–4000 m in Himalayas; winters below 3000 m to foothills, down to 250 m. Sometimes forages in bushless and treeless meadows adjacent to and even far from forest. Ecologically similar to *T. torquatus* in European Alps.
Food and Feeding. Invertebrates including earthworms (fed to young) and insects, also fruit, drupes and berries (hawthorn, crab apple, cotoneaster, holly, dwarf mistletoe); dependent more on vegetable material in winter. Forages on ground and in trees; in winter also near villages and on grass in gardens, sometimes in large flocks with other thrushes.
Breeding. Mar–Jul. Nest a compact large cup of moss, grass, rootlets and stems, lined with dry grass and rootlets, placed 1–3 m up (sometimes where snow has broken crown) on branch in tree, on mossy stump, rarely on or near ground. Eggs 3–4, pale blue with pale reddish-brown blotches. No other information.
Movements. Sedentary and partial migrant, making seasonal vertical movements. One record from N Myanmar and one sight record from Bangladesh.
Status and Conservation. Not globally threatened. Locally common, but shy and rather solitary. In Nepal locally common, but large stretches of primary forest may hold only sparse populations; more frequent than *T. boulboul* in upper oak–rhododendron forest. Uncommon to locally common in China. Report of breeding in Pakistan considered doubtful.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Clement & Hathway (2000), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Vaurie (1972), Wunderlich (1988b).

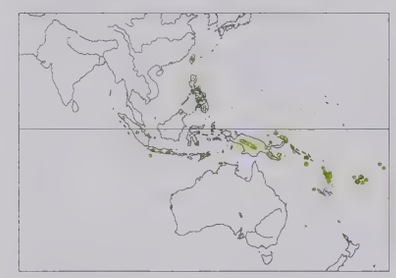
46. Island Thrush

Turdus poliocephalus

French: Merle des îles **German**: Südseedrossel **Spanish**: Zorzal Insular
Other common names: New Guinea Blackbird (*papuensis*); Goodenough Island Blackbird (*canescens*); Vinous-tinted Blackbird (*xanthopus*)

Taxonomy. *Turdus poliocephalus* Latham, 1801, Norfolk Island.
Taxonomy highly complex. Races group into four morphological types, but attempts to "tease out" taxa or groups as separate species largely frustrated by irregular distributions of taxa with allied characters. Highly distinctive Taiwanese race *niveiceps*, although clearly allied to present species, possibly best candidate for species status, being the only race with pronounced sexual dimorphism, and much the most N outlier. Proposed race *biesenbachi* (from Mount Papandajan, in W Java) considered not reliably distinguishable from *fumidus*. Two additional populations, as yet undescribed, apparently exist in C & E Sulawesi. Races *mareensis* (Maré, in Loyalty Is) and *vinitinctus* (Lord Howe I) extinct. Forty-nine extant subspecies recognized.
Subspecies and Distribution.
T. p. loeseri Meyer de Schauensee, 1939 – N Sumatra.
T. p. indrapurae Robinson & Kloss, 1916 – SC Sumatra.
T. p. fumidus Statius Muller, 1844 – Mt Papandajan, Mt Pangrango and Mt Gedeh, in W Java.
T. p. erythropleurus Sharpe, 1887 – Christmas I, S of W Java.
T. p. javanicus Horsfield, 1821 – mountains of C Java.
T. p. stresemanni M. Bartels, Jr, 1938 – Mt Lawu, in EC Java.

T. p. whiteheadi (Seebohm, 1893) – mountains of E Java.
T. p. niveiceps (Hellmayr, 1919) – Taiwan.
T. p. thomassoni (Seebohm, 1894) – N Philippines (N Luzon).
T. p. mayonensis (Mearns, 1907) – S Luzon.
T. p. mindorensis Ogilvie-Grant, 1896 – Mindoro (NC Philippines).
T. p. nigrorum Ogilvie-Grant, 1896 – Negros (SC Philippines).
T. p. malindangensis (Mearns, 1907) – Mt Malindang, in NW Mindanao (S Philippines).
T. p. katanglad Salomonsen, 1953 – C Mindanao.
T. p. kelleri (Mearns, 1905) – Mt Apo, in SE Mindanao.
T. p. seebohmi (Sharpe, 1888) – N Borneo (mountains of Kinabalu, Trus Madi and Tambuyukon).
T. p. hygroscopus Stresemann, 1931 – S Sulawesi.
T. p. celebensis (Büttikofer, 1893) – SW Sulawesi.
T. p. schlegelii P. L. Sclater, 1861 – W Timor.
T. p. sterlingi Mayr, 1944 – Timor Leste (E Timor).
T. p. deningeri Stresemann, 1912 – Seram.
T. p. versteegi Junge, 1939 – mountains of W New Guinea.
T. p. carbonarius Mayr & Gilliard, 1951 – mountains of EC New Guinea.
T. p. keysseri Mayr, 1931 – mountains of Huon Peninsula, in NE New Guinea.
T. p. papuensis (De Vis, 1890) – mountains of SE New Guinea.
T. p. tolokiwae Diamond, 1989 – Tolokiwa I, in Bismarck Archipelago; reportedly also New Britain.
T. p. beehleri Ripley, 1977 – New Ireland.
T. p. heinrothi Rothschild & Hartert, 1924 – St Matthias.
T. p. canescens (De Vis, 1894) – Goodenough I, in D'Entrecasteaux Archipelago.
T. p. bougainvillei Mayr, 1941 – Bougainville I.
T. p. kulambangrae Mayr, 1941 – Kolombangara I, in C Solomons.
T. p. sladeni Cain & Galbraith, 1955 – Guadalcanal.
T. p. rennellianus Mayr, 1931 – Rennell I, in S Solomons.
T. p. vanikorensis Quoy & Gaimard, 1830 – Santa Cruz Is (Utupua, Vanikoro) and N Vanuatu (Espíritu Santo, Malo).
T. p. placens Mayr, 1941 – Ureparapara and Vanua Lava, in Banks Group.
T. p. whitneyi Mayr, 1941 – Gaua I, in Banks Group.
T. p. malekulae Mayr, 1941 – Pentecost, Malekula and Ambrym, in Vanuatu.
T. p. becki Mayr, 1941 – Paama, Lopevi, Epi and Emae, in Vanuatu.
T. p. efatensis Mayr, 1941 – Efate and Nguna, in Vanuatu.
T. p. albifrons (E. P. Ramsay, 1879) – Erromanga, in Vanuatu.
T. p. pritzbueri E. L. Layard, 1878 – Tanna (in Vanuatu).
T. p. xanthopus J. R. Forster, 1844 – New Caledonia (apparently surviving only on Yandé).
T. p. poliocephalus Latham, 1801 – Norfolk I (probably extinct).
T. p. layardi (Seebohm, 1891) – W Fiji (Viti Levu, Ovalau, Yasawa, Koro).
T. p. ruficeps (E. P. Ramsay, 1876) – Kadavu, in S Fiji.
T. p. vitiensis E. L. Layard, 1876 – Vanua Levu, in E Fiji.
T. p. hades Mayr, 1941 – Gau, in E Fiji.
T. p. tempesti E. L. Layard, 1876 – Taveuni, in E Fiji.
T. p. samoensis Tristram, 1879 – Samoa (Savaii, Upolu).



Descriptive notes. 17–25 cm; 40–86 g. An astonishingly variable species, but always with yellow bill, eyering and legs, plain brown to blackish upperparts from mantle rearwards, and plain underparts; often with distinctive coloured hood. Sexes generally similar, female slightly duller or browner than male. Juvenile roughly resembles adult but browner overall, with buffish spotting and streaking above, double buff-spotted wingbars, mottled dark and buff below. Races vary mainly in size, plumage colour or tone, those in Solomons and some other parts of Pacific also strikingly small (although with little reduction in bill or leg size), following details referring to males: nominate race (probably extinct) is blackish with indistinctly separated pale buffish-grey hood, white-streaked vent; *erythropleurus* is olive-brown above, with pale grey throat and breast, orange belly and flanks; *loeseri* is blackish or blackish-brown; *indrapurae* has dark brown upperparts with more creamy-brown hood, orange-rufous belly and flanks, dark brown lower belly to vent, latter pale-streaked; *fumidus* has brown upperparts and hood, latter paler, with belly and flanks orange-rufous, lower mid-belly white, white-streaked brown vent; *javanicus* is dull dark brown above, face to throat buff-brown, mid-belly orange, vague white vent streaks; *stresemanni* is like previous but larger and more reddish-brown; *whiteheadi* has hood grey-brown, brown upperparts, orange-rufous below, white central belly; *seebohmi* has sooty blackish-brown hood and upperparts, orange-rufous belly and flanks, lower mid-belly white, brown vent streaked white and orange; *niveiceps* is white-hooded, with blackish upperparts and breastband shading to orange belly, vent with broad black and white stripes, female similar but browner above, head brown with buff postocular supercilium, buff-speckled cheeks, buff submoustachial and throat with dark-stippled malar and throat streaks; *thomassoni* is glossy black, with dark brown crown to nape, paler side of neck, grey face and throat side, white vent streaks; *mayonensis* is black, with hindcrown to breast blackish-brown, white-streaked vent; *mindorensis* has dull greyish-buff hood with otherwise dark brown upperparts, orange-rufous belly and flanks, white lower mid-belly, white-streaked blackish vent; *nigrorum* is grey-brown above, paler below, whitish on vent; *malindangensis* is dark grey-brown above, grey below with brownish flanks and vent, latter white-streaked; *katanglad* is dark greyish-brown above and on broad band across belly, with paler brown hood, orange flanks, white mid-belly, white-streaked dark brown vent; *kelleri* is dark brown above, darker on front of face, pale brown on throat to nape, dull dark brown below; *celebensis* is greyish olive-brown with dusky-olive hood, orange-rufous belly and flanks, mid-belly to vent white, latter streaked brown; *hygroscopus* is like previous but larger, paler-hooded; *schlegelii* is greyish olive-brown above with grey-brown hood, orange-rufous belly to vent; *sterlingi* is like previous, but hood and belly colours darker; *deningeri* is blackish, with indistinctly separated white hood; *versteegi* is brownish-black with blackish-brown hood, brownish-black crown; *carbonarius* is blackish, with browner flight-feathers and underparts; *keysseri* is small, dark brown, with rusty scaling on belly; *papuensis* is uniform blackish, except for blackish-brown face and throat, shading to whitish chin; *tolokiwae* is dull dark grey-brown above, slightly paler below, with vague pale scaling from belly to vent; *heinrothi* is blackish-brown, with head and most upperparts browner; *beehleri* is like previous, but crown blackish, upperparts washed olive, face to lower throat deep greyish-brown; *canescens* is blackish with dull brown-washed grey hood; *bougainvillei* is blackish-brown with paler throat and breast; *kulambangrae* is blackish-brown; *sladeni* is larger than last, with paler underwing; *rennellianus* is sooty-black above, blackish-brown below, with rusty scaling on belly and flanks, rusty thighs and rust-tipped vent; *vanikorensis* is sooty-brown with blacker crown; *placens* is smallest, dull brown above, face to breast greyer, belly tinged rufous-buff; *whitneyi* is small, sooty-black, brownish on face to breast; *malekulae* is blackish-brown, olive-tinged dorsally, face and neck side grey-brown, belly and flanks orange-buff, white vent streaks; *becki* is dark brown, with pale grey face to breast, white belly and white vent streaks; *efatensis* is sooty-black and short-tailed; *albifrons* is blackish with clean-cut extensive white hood, white-streaked vent; *pritzbueri* is like last but hood duller, no vent streaks; extinct *mareensis* was black above, blackish-brown below, with white vent streaks; *xanthopus* is dark brown above, cinnamon-brown below; extinct *vinitinctus* was grey-brown on head, olive-brown on rest of upperparts, pale vinous-brown below; *layardi* is brown above from head below eye to tail, grey chin to breast, tawny belly and flanks, white lower central belly, orange-streaked brown vent; *ruficeps* is black with clean-cut rufous-buff hood; *vitiensis* has dark grey crown and upperparts, pale grey face to breast shading darker below, with rufous belly tinge; *hades* is glossy black; *tempesti* is like nominate but hood cleaner-cut, blacker body, more orange bill and eyering; *samoensis* is sooty-black, sometimes with blackish-brown hood. VOICE. Song, usually delivered in early morning or evening, a series of loud, clear melodious phrases that start slowly with alternating high and low notes, then accelerate into lusty finish (Borneo, Java); subdued melody of fluted whistles (Fiji); reportedly like that of *Erithacus rubecula* (New Caledonia). Calls include metallic chattering snappy staccato "chik-chik-chik-chik-chik…" or "chak-chak" series in alarm, starting quickly but slowing; a short harsh rasp, perhaps the call reported elsewhere as a weak, high, slightly downslurred "tss"; and high "seeee" in flight.

Habitat. Woodland and forest of almost any type with mature trees and fairly open understorey, edges of clearings; on mountainous islands mainly confined to mountains, often upper reaches (e.g. mistforest on Guadalcanal), although from sea-level to highest reaches on some, e.g. Vanuatu, and spread through lowland forest on level islands such as Rennell; generally becomes more montane to NW of range, but variation in elevation may have to do with ability to compete with other bird species, as present species never appears in avifaunally complex assemblages. Found on Taiwan in upper reaches of montane forest, heath forest, 1800–2500 m. On Mindoro recorded from 1200 m upwards, with most found in *Podocarpus*; elsewhere in Philippines generally above 1000 m, to c. 1650 m. In Borneo breeds above 2100 m (to 3200 m, two records from c. 1500 m), in cold damp mossy upper montane forest, but forages also on bare rocks higher up. In Sumatra in heather and other semi-open scrub vegetation at 2000–3450 m. In Java confined to tops of highest mountains. In Sulawesi mainly above 2500 m, range 1500–3500 m. On W Timor 1200–2000 m, and on Timor Leste 2300–2600 m. On Seram 1800–2800 m. In New Guinea in upper edges of forest (often concentrated in tree-line ecotone) and beyond tree-line into grassland dotted with tree-ferns, not venturing into grassland areas without cover, but in Snow Mts, far above timber-line, found in and near rocky cliffs (which substitute for tree cover), 2250–4250 m; 1160–1520 m on Karkar I; 1380–1650 m in C New Britain; above 1400 m on Bougainville, above 1500 m on S New Ireland and above 1600 m on Goodenough I; low on Mussau (which reaches only 650 m). In Fiji at any elevation, but in Samoa mostly restricted to higher reaches. Among very similar races, one may live in high mountains while a neighbour occurs near seashore.

Food and Feeding. Snails, slugs, worms, insects (including beetles, fly larvae), myriapods, mites, spiders; also small fruits, berries and seeds, including (and in Java chiefly) *Vaccinium*, also *Rubus*; on Christmas I also carrion, and seen to kill a small brown lizard. Also takes fruit in forest in New Guinea, including *Elaeocarpus* and, in clearings, raspberry (*Rubus*); stomachs contained seeds of a sedge (highly favoured), fruits of several trees and shrubs including *Rubus*, a taxad and *Gaultheria*, and some insects. Forages very much in manner of *T. merula*, in leaf litter and low vegetation, hopping about in dense cover and coming out into open patches such as clearings, grassland patches and roads through forest; forages also in canopy.

Breeding. Apr–May in Philippines, with breeding-condition birds Feb, Mar, Jun and Oct; Feb–Mar in Borneo; no information for Sulawesi, but song heard Jul and Oct; nest and nestlings Jun, fledglings Jul–Aug and breeding-condition birds Jun-Sept in New Guinea; Dec–Jan (fledglings to Apr) on Christmas I; reportedly Aug–Dec and Mar–May on Norfolk I; eggs end Sept, Nov and Dec on Lord Howe I; in New Caledonia, Dec–Jan on Yandé and Jul–Aug on Lifou; Oct–Nov on Mare, in Loyalty Is, but birds in breeding condition Aug and fledged young same month; Jun–Sept on Espíritu Santo, and similar regimes extending to Dec on other islands in Vanuatu; Jun–Jan in Fiji. Nest a substantial cup of interwoven grass stems, fine roots, wild palm fibres, leaf skeletons, vine tendrils, soft twigs, leaves and/or shredded bark, sometimes covered externally in moss and lichen, lined with soft grass blades, generally placed low down in forest regrowth (four nests on Yandé were 1·5 m, 1·6 m, 2 m and 5 m up), hidden within epiphyte on branch, or in gnarled and knotted meshing branches of stunted tree (once at 3 m in *Leptospermum* tree, Borneo; once in crown of *Pandanus* screw-pine and once on broken tree trunk, Christmas I), often close to clearing; in New Caledonia, nest a cup of dried ferns, rootlets and leaves, placed at foot of tree. Eggs 1–3, normally 2 (1 in Borneo), pale green or blue-green with small but extensive tawny-brown spots, in New Caledonia greenish with small irregular brown markings (details lacking for many parts of range). No other information.

Movements. Resident throughout range. Some local elevational movements; Bornean population (on Gunung Kinabalu) appears semi-nomadic, sometimes numerous in areas where previously absent, presumably in response to fruit availability.

Status and Conservation. Not globally threatened. Common to rare. Several races, mostly low-lying populations, have become extinct or threatened, while others appear to maintain very high numbers within restricted montane ranges. Nominate race, on Norfolk I, was common up to 1941 but approaching extinction by 1967, last seen in 1975 and probably now extinct; causes of its disappearance probably clearance of native vegetation, competition and/or hybridization with (self-)introduced *T. merula*, and, most significantly, predation of young by black rat (*Rattus rattus*), which became established in 1940s. Race *vinitinctus* of Lord Howe I, originally very common and widespread, became extinct in the decade after black rats became established there following a shipwreck in 1918. Race *erythropleurus* on Christmas I, with estimated total population of 4000 breeding birds in c. 100 km² of suitable habitat, nationally red-listed as "Critical" owing to establishment and rapid advance of yellow crazy ant (*Anoplolepis gracilipes*), as this exotic insect could kill nestlings and radically alter the island's ecology by removing the dominant red crab (*Gecaroidea natalis*), but ants very recently controlled; this race introduced to Cocos-Keeling Is in late 19th century and was well established there in 1940s, but now extinct there. New Caledonia race *xanthopus* has long been presumed extinct on main island (Grande Terre), but population of at least 100 individuals has been found on Yandé, an islet N of Grande Terre, and one seen on a second island, Neba, was almost certainly of this species and race. Loyalty Is race *mareensis* is extinct; *pritzbueri* also extinct in Loyalty Is (Lifou), but survives in Vanuatu, where seen on Tanna in 1998. Rare on Taiwan (*niveiceps*). Population in Samoa (Savaii and Upolu) regarded as of conservation concern in face of steadily expanding agriculture. Generally common in Philippines above 1000 m, but *thomassoni* very common only on Mt Cetaceo (Sierra Madre), in Luzon; on Mindoro, species increasingly common with increasing elevation from 1200 m up. In Sumatra, the commonest bird (race *loeseri*) on various summits of Gunung Leuser, and locally common

(*indrapurae*) on three other mountain tops on island. Within elevational range in Borneo, one of two commonest bird species until bare rock reached, and elsewhere in Greater Sundas also locally common to common within elevational confines. In W Timor *schlegelii* moderately common to abundant, and in E Timor *sterlingi* likewise. On New Guinea fairly common locally.

Bibliography. Andrews (1900), Beehler et al. (1986), Beichle & Baumann (2003), Bishop & Jones (2001), Bradley & Wolff (1956), Bregulla (1992), Cain & Galbraith (1956), Chasen & Hoogerwerf (1941), Cheng Tsohsin (1987), Clement & Hathway (2000), Clunie (1984), Coates (1990), Coates & Bishop (1997), Danielsen *et al.* (1994), Davison (1992), Diamond (1972, 1989), Dickinson *et al.* (1991), Doughty *et al.* (1999), duPont (1976), Garnett & Crowley (2000), Hannecart (1988), Hermes (1985), Hermes *et al.* (1986), Hindwood (1940), Hull (1909), Kennedy *et al.* (2000), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Mayr & Rand (1937), McKean *et al.* (1976), Mees (1996), Meyer de Schauensee (1984), de Naurois (1982), Pratt *et al.* (1987), Rand (1942), Rand & Gilliard (1967), Ripley & Rabor (1958), Rowland (1995), Schodde & Mason (1999), Schodde *et al.* (1983), Sheldon *et al.* (2001), Smithers & Disney (1969), Smythies (1999), Stokes (1988), Stokes *et al.* (1984), Stresemann & Heinrich (1940), Warner (1947), Watling (1982, 2001), White & Bruce (1986).

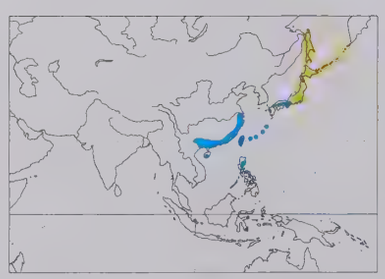


47. **Brown-headed Thrush**

Turdus chrysolaus

French: Merle à flancs roux **German**: Japandrossel **Spanish**: Zorzal Cabecipardo
Other common names: Red-billed Thrush, Brown Thrush, Japanese Thrush

Taxonomy. *Turdus chrysolaus* Temminck, 1832, Japan.
Formerly treated as conspecific with *T. pallidus* and sometimes also with *T. celaenops* or *T. obscurus*. Birds from N & C Kuril Is described as race *orii* on basis of supposedly larger size and darker plumage, but characters not constant. Monotypic.
Distribution. Sakhalin, Kuril Is, N Japan, possibly also N Korea; non-breeding Japan, Ryukyu Is, SE China, Taiwan and N Philippines.
Descriptive notes. 23–24 cm; 64–90 g. Male has slaty-brown face and throat, shading through brown on hindcrown and neck to russet-tinged brown upperparts; chestnut-orange breast and flanks, white belly to vent, latter with brown lines; narrow yellow eyering; bill dull yellow, usually dusky on upper mandible; legs brownish. Female is similar to male, but head is more concolorous with upperparts, submoustachial streak and throat whitish, dark malar and other streaking. Juvenile is brown with buff streaking above, with diffuse buff submoustachial and throat divided by dark brown malar, latter merging into half-necklace of spots that spread out over lower underparts on orange flanks and white belly. Voice. Song, sometimes given prior to spring migration, is a series of phrases consisting of 3–4 notes, "krurr kruur krr-zeee" or "kiron kiron tsee", lasting c. 2 seconds with 5-second interval. Calls include harsh "chuck-chuck", bubbling alarm and, when flushed or in flight, thin "zeeee".



Habitat. Breeds in dense broadleaf deciduous and mixed forests and forest edge; on Sakhalin most frequent in deciduous groves in river floodplains, along streams, by lakeshores and bordering sea coves. In Japan (at least) avoids shady, damp forest, preferring usually open, fairly dry deciduous or mixed woodland with some shrubby undergrowth, sometimes open coniferous woods, and up to tree-line in subalpine woodland and bush; 700–2400 m on Honshu, and almost sea-level to 1200 m on Hokkaido. In winter occupies broadleaf forests at all elevations, also second growth and clearings near cover, but generally lower in cultivated land, mixed scrub, orchards, groves, and well-wooded suburban parks and gardens; in Philippines, in lowland scrub and selectively logged forest from sea-level to 250 m.

Food and Feeding. In summer mainly insects (cicadas, click-beetles, weevils, carrion beetles, carabid beetles, bumblebees, ants and caterpillars), but also spiders and molluscs. In autumn and early spring mainly fruit, including rowanberries, currants, whortleberries, honeysuckle, juniper, bilberries and cranberries; also yew berries and "nuts of recumbent cedars". Forages at all levels in forest.
Breeding. Late May to Jul N of range; May–Aug in Japan; double-brooded. Nest a cup of mud, grass and pine needles, lined with dried leaves, placed on or close to ground (rarely higher than 4·5 m) in tree or shrub; in one study, C Japan, *Tsuga diversifolia* frequently used, with average nest height 3·7 m. Eggs 2–5, usually 3–4, pale blue to olive with wide variation in spotting colour; incubation period 13–14 days; nestling period 13 days.
Movements. Migrant, moving along Chinese coast. Departs Sakhalin Sept–Oct, with late leavers into early Nov; leaves Japan Sept–Oct, when a common passage migrant throughout country, returning Apr–May. Passage migrant and winter visitor in small numbers (fluctuating annually, sometimes none) in Hong Kong, end Nov to mid-Apr, most records from end Dec to mid-Mar. Present in winter in varying numbers in Philippines mid-Sept to early Apr. Spring migrants reach Sakhalin end Apr to start May.
Status and Conservation. Not globally threatened. Fairly rare to locally common on Sakhalin. Common summer breeder in S Kurils, Hokkaido and N & C Honshu, making it commonest breeding thrush in Japan; becomes scarce to uncommon in SW Honshu and Shikoku. In N Korea probably a very rare breeding species. Fairly uncommon in China and Philippines in winter.
Bibliography. Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), Danielsen *et al.* (1994), Dementiev *et al.* (1968), Dickinson *et al.* (1991), Gore & Won Pyongoh (1971), Haneda & Watanabe (1969), Herklots (1967), Kennedy *et al.* (2000), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Tomek (2002), Vaurie (1955c).

48. Izu Thrush

Turdus celaenops

French: Merle des Izu **German**: Izudrossel **Spanish**: Zorzal de las Izu
Other common names: Seven Islands Thrush

Taxonomy. *Turdus celaenops* Stejneger, 1887, Miyakeshima, "The Seven Islands", Izu, Japan.
Sometimes considered conspecific with *T. chrysolaus*. Proposed race *yakushimensis* purportedly larger and darker, with darker bill, but features not constant. Monotypic.
Distribution. N Ryukyu Is and Izu Is, off S; some move to adjacent Honshu and O-shima in winter.



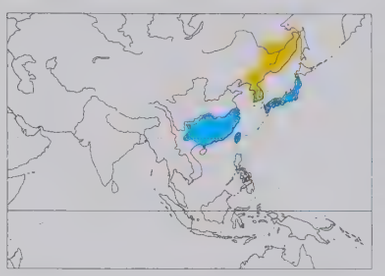
Descriptive notes. 23 cm. Male has black hood to lower breast, rich brownish-russet upperparts, blackish wings and tail; chestnut-orange upper belly and flanks, white mid-belly to dark-streaked vent; yellowish bill, narrow yellow eyering; brownish legs. Female is like male, but head dark brown, whitish throat, dark brown malar and throat streaks. Juvenile is brown with buff streaking above, diffuse buff submoustachial and throat, dark brown malar, buffish with spotting below. Voice. Song, from low perch, mid-Mar to early Jul, a series of 3–5 buzzing trills, "tsurrrrrr… turrrrrr… tzurrrrrrr… tsizi", deeper than those of *Luscinia akahige*, each trill changing pitch and with middle part sharper, as if inhaling, sometimes without brief concluding "tsizi", sometimes interspersed with abrupt "chik!" notes. Alarm a bubbling call, deeper and more guttural than that of *T. pallidus* and *T. chrysolaus*.
Habitat. Mature deciduous woodland and laurel forest, preferably with strong canopy and sparse shrub layer, including (on Miyake-jima) camellia orchards and forest and (on Yakushima, at least formerly) mixed juniper–rhododendron forest in upper mixed-forest zone; avoids dense understorey of bamboo, but enters adjacent open areas such as ploughed farmland, undisturbed gardens, roadsides. On O-shima breeding records are from mountainsides above 400 m (possibly because habitat present only from there upwards); no evidence of elevational limitation elsewhere.
Food and Feeding. Fruit, seeds and, in summer, mainly invertebrates; focuses on caterpillars in canopy during Apr–Jun. Main food brought to nestlings was earthworms (64%), insects (14%) and centipedes (10%). Forages mainly in canopy and on ground amid leaf litter, also in more open areas adjacent to forest cover.
Breeding. Mar–Jun on Miyake-jima, rarely into Aug, peak in May; similar period on other islands inferred from various records of nests and nestlings; most pairs single-brooded. Nest made of grasses and leaves, plastered with mud, covered in moss, placed 1·5–6 m up on low branch, sometimes on ground. Eggs 2–5, usually 3–4, clutch size apparently related to mean temperature in Apr (on average, larger clutches in warmer years), eggs white, pale brown or pale green with red-brown to purple markings; no information on incubation and fledging periods. Breeding success on Miyake-jima 85% in 1985 study and 71–78% in 1978–1980, but only 7·3% in 1991.
Movements. Mainly sedentary on Izu Is, but in winter some move N to adjacent parts of Honshu (mainland Japan), with a few more scattered records across Japan, Dec–Feb; record from Ogasawara (Bonin Is), if not mistaken, indicates considerable dispersive capability. Population in N Nansei Shoto may be sedentary or migratory; records there span Mar–Oct.
Status and Conservation. VULNERABLE. Restricted-range species: present in Izu Islands EBA. Population placed in range 2500–10,000 (probably never greater than this owing to tiny range), and considered declining because of impacts of introduced species. Densities variable: in 1973, roadside transects in several of the Izu islands yielded (per km) 5·7 and 3·8 birds on To-shima, 0·7 on Nii-jima, 7·3 on Mikura-jima, 2·5 and 1·7 on Hachijo-jima, and 12·5 and 13·8 on Aoga-shima. In recent review, 34 localities mapped of which only twelve known to involve post–1980 records. Nest and fledgling predation by Siberian weasel (*Mustela sibirica*), introduced on Miyake-jima in 1970s to control rabbits, and by Large-billed Crows (*Corvus macrorhynchos*) and domestic cats is the main threat. Crow populations on Miyake-jima and certain other islands have risen dramatically in response to increased refuse-dumping, an issue that needs to be addressed. Of 22 nests with eggs found in 1992 on Miyake-jima, all were preyed on at nestling stage. Extent of changes in thrush populations unclear, as threats not present on all islands. Important population on Miyake-jima most obviously affected: roadside transects in 1978–1980 found 24·4, 33·4 and 28·8 birds/km, this falling to 6·7 and 11·1 birds/km in 1991; population may also have been affected by major volcanic eruption in Aug 2000. Entire Izu Archipelago designated a national park, several important sites are special protection areas, and a small sanctuary (nature centre) exists on Miyake-jima. Detailed ecological studies, stronger park management and intensive control of nest predators now needed. Protected by Japanese law.
Bibliography. Anon. (2000a), Austin & Kuroda (1953), Brazil (1991), Clement & Hathway (2000), Collar *et al.* (2001), Crystal (2005), Higuchi (1973), Kawaji *et al.* (1989), Kiyosu (1965), Mochizuki (1993), Moyer (1957), Stattersfield & Capper (2000), Takagi & Higuchi (1992), Vaurie (1955c), Yamamoto *et al.* (1996), Yamashina (1942).

49. Pale Thrush

Turdus pallidus

French: Merle pâle **German**: Fahldrossel **Spanish**: Zorzal Pálido

Taxonomy. *Turdus pallidus* J. F. Gmelin, 1789, "Sibiria, *ultra lacum* Baikal" = Transbaikalia.
Formerly treated as conspecific with *T. chrysolaus* or with both latter and *T. obscurus*. May also be close to *T. celaenops*. Monotypic.
Distribution. SE Russia, NE China, Korea, and has bred Japan (SW Honshu); non-breeding S China (S of R Yangtze), S Japan and Taiwan.



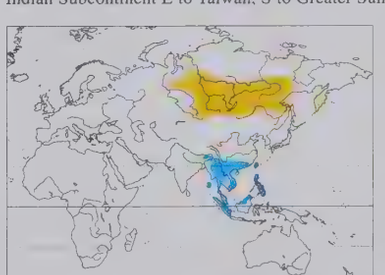
Descriptive notes. 22–23 cm; 64–90 g. Male has dull brownish-grey head, often (presumably older birds) extending to chin and throat, shading to chestnut-tinged pale brown upperparts, and to buffy-grey on breast and flanks and whitish-buff on throat and lower underparts; primaries greyish-brown, outer tail tipped white; bill dull yellowish; legs pinkish to dull fleshy brown. Female is like male but duller, with whitish chin, grey-streaked throat. Juvenile is brown above, pale orange below, spotted and streaked. Voice. Song, sometimes given just prior to spring migration, a series of loud, cheerful but monotonous phrases, "trrer-treer-trrer tuudle", second note rising slightly and fourth delayed, lasting c. 2 seconds with 5-second interval; also as "tuvee-tulee… tulee-tuvee…". Calls include harsh typical "chuck-chuck", harsh bubbling alarm, and "tzeeee" as flight note.
Habitat. Low montane and submontane pine and deciduous forest, spruce forest, fir–pine woodland, thickets, secondary vegetation, parks. On autumn migration in Japan, occurs in open woodland on hillsides, among scrub, and potentially anywhere with berry-laden vegetation. In winter found in lowland forest, forest edge, open woodland, urban and suburban areas, fields and gardens.
Food and Feeding. Insects (coleopterans) and spiders, also fruits (including whortleberries) and seeds. Commonly forages on ground in leaf litter; also in trees and bushes for berries.
Breeding. May–Aug, mainly May–Jun in Russia, May–Jul in China and Jun–Jul in N Korea; bred Aug (once) in Japan; double-brooded. Nest a cup of grass, dry pine needles, stalks, rootlets and mud, placed in crotch of small tree or bush near stream. Eggs 4–6, greenish with reddish-brown spots; incubation period 13–14 days; fledging period 13–15 days.
Movements. Summer visitor to SE Russia and NE China, wintering Japan, S China (S of R Yangtze) and Taiwan. Autumn passage in Japan spans late Sept or early Oct to mid-Nov, many wintering, others pressing farther S. Present in winter, Hong Kong, mainly late Nov to early Apr; 80% of records Jan–Mar. N migration in Korea recorded Apr to mid-May, and in Japan from mid-Apr to early May, some lingering into Jun on Hokkaido. Vagrants recorded in Philippines late Nov to late Mar.
Status and Conservation. Not globally threatened. Fairly common in Russia. Common in China, although scarce to uncommon in winter in Hong Kong; common in winter in Shanghai area (where apparently territorial). Uncommon to rare breeding and wintering species in Korea. In winter, very common in Japan on Honshu, Sado, Shikoku and Kyushu, less so on Hokkaido, where formerly (until mid-20th century) its numbers were greatly reduced by trapping for food.
Bibliography. Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), Dementiev *et al.* (1968), Flint *et al.* (1984), Glutz von Blotzheim & Bauer (1988), Gore & Won Pyongoh (1971), Herklots (1967), Kennedy *et al.* (2000), Lee Woo-Shin *et al.* (2000), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Sowerby (1943), Tomek (2002), Ueno *et al.* (1993), Zheng Guangmei & Zhang Cizu (2002).

50. Eyebrowed Thrush

Turdus obscurus

French: Merle obscur **German**: Weißbrauendrossel **Spanish**: Zorzal Rojigrís
Other common names: Dark Thrush, Grey-headed Thrush, White-browed Thrush

Taxonomy. *Turdus obscurus* J. F. Gmelin, 1789, "Sibiriae *silvis*, *ultra lacum* Baical" = Transbaikalia.
Has been considered conspecific with *T. chrysolaus* and *T. pallidus*. Monotypic.
Distribution. C & E Siberia E to Kamchatka, S to N Mongolia and Amurland; non-breeding NE Indian Subcontinent E to Taiwan, S to Greater Sundas and Philippines.



Descriptive notes. 21–23 cm; 61–117 g. Male has whitish supercilium, subocular line, short submoustachial streak and chin, blackish-brown lores, and brownish-grey face streaks and malar; rest of head grey, russet-tinged olive-brown rest of upperparts; dull orange to clay-coloured breast and flanks, whitish on lower belly to vent; bill dull brown, yellowish lower mandible; legs brownish-yellow. Female is like male but head browner, with more white on side of neck and throat, duller below. Juvenile is brown above, pale orange below, with diffuse dark and pale head markings, buff spotting and streaking above, extensive dark spotting below. Voice. Song a deliberate series of short, disjointed, varied phrases consisting of simple rich but often harsh or reedy notes, "teveteu… trrryutetyuté… trrryutetyutyu…", often finished by very short, higher trill, buzz or few tinkly notes. Chuckling subsong from flocks before spring

On following pages: 51. Grey-sided Thrush (*Turdus feae*); 52. Tickell's Thrush (*Turdus unicolor*); 53. Grey-backed Thrush (*Turdus hortulorum*); 54. Black-breasted Thrush (*Turdus dissimilis*).

departure. Calls include thin "zip-zip" when taking flight, chuckling "dack-dack" and "gigigig", thin drawn-out "ziiii" or "tseep" and crackling rattle, "turrr".
Habitat. Breeds in gloomy, moist spruce–fir (*Picea–Abies*) forest, preferably near water, also birch (*Betula*) forest with underbrush, fringes of taiga dominated by larch (*Larix*), mixed forests, in both lowland and montane landscapes; sea-level to 1500 m, occasionally to 2400 m. Winters in open evergreen and deciduous forest, secondary forest, hillside scrub, damp gulleys, woodlots, plantations including casuarina groves, mangroves, beach scrub, semi-open country, fields, orchards, from foothills to 2300 m; reaches almost 3300 m in Borneo (on Gunung Kinabalu). On passage, found also in forest edge, scrub, farmland and orchards, and wooded gardens.
Food and Feeding. Insects, snails, berries; apparently exclusively berries on arrival in Borneo, where fruits with seeds 7 × 5 mm found in stomachs. Forages both on ground and in trees. In winter in Philippines, at least, judged to forage higher in forest than do other thrushes. Sometimes, or perhaps typically, in large loose flocks in winter, e.g. in Thailand and Indochina.
Breeding. May–Jul; fledglings in Aug in Mongolia; usually double-brooded. Nest a cup of grass, rootlets, bark and twigs with some mud admixed, lined with fine grass, placed in fork of small tree in forest understorey. Eggs 4–6, pale blue with reddish-brown markings; no information on incubation period; fledging period at least 10 days.
Movements. Migratory. Winters from NE Indian Subcontinent (mainly E from Bhutan) and Myanmar E to Taiwan, and S to Greater Sundas and Philippines; scattered records from Himalayas W to C Nepal, and straggler to S India, Sri Lanka, Maldives and Lesser Sundas. Departs Russia Sept, some moving along R Yenisey past Krasnoyarsk to Minusinsk, and abundant in Mongolia in last third of month, when migrants common around L Khalkhin. Commonly encountered in China on passage, but mostly bypasses Korean Peninsula (most records May and Nov). Main autumn passage (small numbers) at Beidaihe (NE China) in second half Sept, but in Hong Kong peak numbers occur in mid-Nov, with spring passage peaking in second half Apr. In Japan, arrives mainly early Oct to early Nov, passing N in spring late Apr and May, some probably wintering in S Japan. Recorded in Myanmar second half Nov to end Mar; in Peninsular Malaysia a winter visitor and passage migrant, with peak numbers in Nov and Mar; records for Sumatra span late Nov to mid-Mar, with 150 individuals seen in flight over Way Kambas National Park in Mar. Present in winter in Philippines late Nov to early May. Passage migrant (e.g. through Labuan) and winter visitor in N & NW Borneo, dates spanning Oct–Apr, and main arrival in Kelabit Highlands in Nov. Casual winter visitor to Caroline Is (Palau). Returning migrants reach vicinity of Krasnoyarsk, Mongolia and Ussuriland last third of May, Kamchatka likewise and into early Jun. Vagrants recorded in many regions, e.g. Europe, Middle East, and regularly in NW USA (Alaska) and Pribilof Is.
Status and Conservation. Not globally threatened. Fairly common to common throughout most of range. On wintering grounds, generally common throughout; fairly common in SE Asia, sometimes visiting S Vietnam in great numbers, and deemed usually commonest thrush in winter in Thailand; common in Sumatra, but rare in Java, and uncommon in Philippines.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Baker (1951), Beaman & Madge (1998), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), Coates & Bishop (1997), Cramp (1988), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dickinson *et al.* (1991), Duckworth, Davidson & Timmins (1999), Gallagher & Woodcock (1980), Glenister (1971), Glutz von Blotzheim & Bauer (1988), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Herklots (1967), Inskipp & Inskipp (1991), Jakobsen (1994), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Mauersberger (1980), Medway & Wells (1976), Meyer de Schauensee (1984), Parrott & Andrew (1996), Piechocki *et al.* (1982), Pratt *et al.* (1987), Rasmussen & Anderton (2005), Robson (2000), Sheldon *et al.* (2001), Smythies (1986, 1999), Tomek (2002), White & Bruce (1986), Wildash (1968), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

51. Grey-sided Thrush

Turdus feae

French: Merle de Fea **German**: Feadrossel **Spanish**: Zorzal de Fea
Other common names: Fea's Thrush

Taxonomy. *Merula Feae* Salvadori, 1887, Mulayit Mountain, Tenasserim, Myanmar.
Monotypic.
Distribution. N China (Beijing, W & N Hebei, Shanxi); non-breeding NE India, Myanmar, NW Thailand.



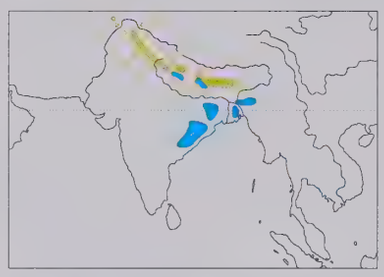
Descriptive notes. 22–23·5 cm. Male has whitish supercilium, subocular line, short submoustachial and throat, blackish-brown lores; bright olive-brown above and on neck side, shading to grey on lower breast and flanks, white on lower belly to vent; bill dark, yellowish lower mandible; legs brownish-yellow. Female is like male, but lores brown, face flecked buff, chin and throat whitish, breast and flanks washed buff. Juvenile apparently undescribed; first-winter resembles female, but some pale streaks on head side, pale-tipped greater wing-coverts, brownish breast-band. Voice. Song a series of short phrases with very short trills and rich melodious burry notes. Calls include thin "zeeee" or "sieee", thinner than that of *T. obscurus*, and a crisp rattle.
Habitat. Breeds in temperate deciduous oak (*Quercus*) and pine (*Pinus*) forest, including dense areas with bushes, in mountains at 1000–1900 m (perhaps mainly above 1500 m). Winters in evergreen forest, both open and dense formations, mainly at 1500–2600 m, but recorded down to 600 m and up to 3050 m; sole record from Laos was of two individuals at c. 530 m, on crumbling streambanks in degraded riverside forest.
Food and Feeding. Invertebrates and fruits (mainly insects and berries); also evidently nectar, from flowering *Acrocarpus fraxinifolius*. Insects and some berries and seeds found in stomachs of recently fledged young. Forages mainly on ground, but also in trees; on passage and in winter commonly in company of *T. obscurus*.
Breeding. May-Jul. Nest a cup of straw, roots and plant fibres bound with mud, placed 1–1·5 m up in small tree amid dense vegetation. Eggs 4–5; incubation by both parents, period c. 14 days; nestling period 12–14 days.
Movements. Long-distance migrant, wintering S & SE Asia. Recorded from mid-Oct in NE India, but earliest in Thailand late Nov. Present NE India to mid-Apr, with sight record in West Bengal in May; numbers thought to increase from late Dec, suggesting that migrants may use as yet unidentified stopover areas en route from N. Breeding-ground records cover May–Sept, but early arrivals in N China in Feb and Mar. Only one record from N Laos.
Status and Conservation. VULNERABLE. CMS Appendix II. Restricted-range species: present in Shanxi Mountains EBA. Generally very scarce. Population currently placed in range 2500–10,000 mature individuals, and considered declining. In recent review, 27 localities mapped, of which only 15 known to involve post-1980 records. Appropriate habitat cover within breeding range now only 20% of original extent, and forest in winter quarters disappearing through wood collection, burning and agriculture. Formerly judged fairly common in winter in NE India on basis of records from Naga Hills, where frequently encountered in winter 1872–1873, but only one recent record, possibly indicative of a decline or change in observer coverage (if not shifts in winter range); could also reflect variation in abundance depending on regional weather conditions. Probably still fairly frequent in NW Thailand in winter, although possibly becoming progressively harder to find there. In breeding areas, known from Pangquangou National Nature Reserve (Shanxi), Lao Ling Nature Reserve (Hebei) and Baihuashan Nature Reserve (Beijing), and may occur (surveys needed) in reserves recently created for Brown Eared-pheasant (*Crossoptilon mantchuricum*); in winter quarters, recorded from Natma Taung National Park, in Myanmar, and Doi Suthep-Pui and Doi Inthanon National Parks and Om Koi Wildlife Sanctuary, in Thailand; also one record from Nakai–Nam Theun National Biodiversity Conservation Area, in Laos. Some evidence that capture for wild-bird trade may be a problem in China, and in various parts of winter range this species may be at risk from hunting. Requires detailed ecological study and strengthening of protected areas in China.
Bibliography. Ali & Ripley (1987b), Bingham (1903), Cai Qikan (1988), Cheng Tsohsin (1987), Clement & Hathway (2000), Collar *et al.* (2001), Dornberger & Barthel (1997), Duckworth, Davidson & Timmins (1999), Duckworth, Tizard *et al.* (1998), Godwin-Austen (1874), Grimmett *et al.* (1998), Hume (1888), Hume & Davison (1878), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Oates (1883), Rasmussen & Anderton (2005), Rippon (1901), Robson (2000), Robson *et al.* (1998), Shaw (1937), Smythies (1986), Stanford & Ticehurst (1938–1939), Stattersfield & Capper (2000), Thewlis *et al.* (1998), Wardlaw Ramsay (1875, 1877).

52. Tickell's Thrush

Turdus unicolor

French: Merle unicolore **German**: Einfarbdrossel **Spanish**: Zorzal Unicolor
Other common names: Indian Grey Thrush

Taxonomy. *T.(urdus) unicolor* Tickell, 1833, Bansigar in Borabhúm, West Bengal.
Has been thought to form a superspecies with *T. hortulorum* and *T. dissimilis*. Monotypic.
Distribution. Himalayas (N Pakistan E to Bhutan); non-breeding in foothills and S to C & E India and Bangladesh.



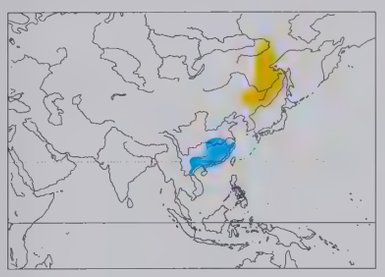
Descriptive notes. 20–25 cm; 58–75 g. Male is plain ashy-grey, slightly paler below, with faint blackish lores, slight white streaking on throat, white mid-belly to undertail-coverts; yellow bill, eyering and legs. Female is pale olive-brown above, with greyish-white submoustachial and chin divided by dark brown narrow malar, latter ending in bunches of spots forming narrow necklace on buff breast; buff flanks, white mid-belly to vent; bill and legs yellowish-brown. Juvenile is brown above, with vague buffy supercilium and buffy streaks from crown to scapulars, double orange-spotted wingbars, malar pattern as female but with spotting denser and continuing down breast and flanks, with orange flush on flanks, shading to buffy-white on belly to vent; immature like female, but buff tips on greater coverts form wingbar, malar more diffuse, no neck spotting. Voice. Song, by male from elevated perch throughout breeding season, often in middle of day, a relaxed series of short phrases with slurred and staccato notes, weaker and less musical than similar song of *T. rubrocanus* (but regionally variable, some more musical and less monotonous than others), with repeated disyllabic or trisyllabic phrases; in Murree Hills (Pakistan), song based on 3-note whistled warble, "chilliyah-chilliyah", while Haro Valley bird sang "chelia chelia… tirlee-tirlee-chelia-chelia" and Gilgit individual "triloo triloo tru-tuleee" with more variation in sequence and repertoire. Calls include loud "juk-juk", chattering decelerating "juh'juk-juk, juk" and short high buzz.
Habitat. Breeds in open broadleaf montane forest with grassy or bare substrate, including mixed deciduous and *Pinus roxburghii* forest, open deodar (*Cedrus deodara*) forest, also willow groves, mixed terraced fields with deciduous trees and scattered bushes, gardens, lawns and orchard groves, at 1200–2400 m; winters in deciduous forest edge, groves and well-wooded areas in lower foothills and adjacent plains.
Food and Feeding. Earthworms, insects and fruit, including orchard windfalls. Seen to bring grubs to nestlings. Forages on bare ground, e.g. in pine leaf litter, but also in short-herb substrates such as lawns; uses typical thrush technique of short hopping runs and pauses. In winter sometimes in loose groups.
Breeding. Apr–Aug, mainly May–Jun; probably double-brooded. Nest a deep cup, sometimes tidy, sometimes straggly, made of fibres, dry or green moss, ferns, roots, dry stems and leaves, sometimes held with mud, lined with fine rootlets or horsehair, placed 7–9 m up in tree fork or against trunk e.g. of mulberry tree, pollard willow, poplar, sometimes in bush or in cavity in bank. Eggs 3–5, greenish-white or reddish-white with strong reddish-brown speckles; incubation period 13–14 days; no information on nestling period.
Movements. Undertakes short-distance S & E migration and minor seasonal vertical movements in winter. In Kashmir departs Sept/Oct; in Pakistan returns Mar/Apr. Records from India, e.g. at Bharatpur Nov–Feb, indicate that some fan out into peninsular lowlands in winter; recorded S in India to Rajasthan and Goa. Vagrant recorded once in Europe (Germany).
Status and Conservation. Not globally threatened. Common in W Himalayas, including locally in N Pakistan up to Afghan border, and in Vale of Kashmir; rarer in E. Uncommon in Nepal. Habit of feeding in orchards sometimes a problem, as it can inflict damage on ripe apricots (*Prunus armeniaca*) and apples (*Malus*).
Bibliography. Ali & Ripley (1987b), Bates & Lowther (1952), Beaman & Madge (1998), Clement & Hathway (2000), Cramp (1988), Dornberger & Barthel (1997), Glutz von Blotzheim & Bauer (1988), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Martens & Eck (1995), Rasmussen & Anderton (2005), Roberts (1992), Vaurie (1972), Wunderlich (1988a).

53. Grey-backed Thrush

Turdus hortulorum

French: Merle à dos gris **German**: Amurdrossel **Spanish**: Zorzal Dorsigrís

Taxonomy. *Turdus hortulorum* P. L. Sclater, 1863, Camoëns Garden, Macau. Guangdong, China.
Has been thought to form a superspecies with *T. unicolor* and *T. dissimilis*; formerly considered conspecific with latter. Monotypic.
Distribution. SE Russia (SE Siberia, Ussuriland), Manchuria and N Korea; non-breeding SE China and N Indochina.



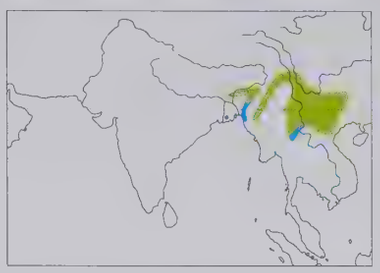
Descriptive notes. 20–23 cm; 61–69 g. Male is grey above, shading to pale grey on mid-breast, with vague buffy-brown submoustachial and grey-streaked whitish chin; lower breast and flanks bright orange-rufous, belly to vent white; eyering yellow, bill yellow; legs yellowish. Female is greyish olive-brown above and on ear-coverts, whitish submoustachial and chin divided by narrow blackish-brown malar, shading into dark-spotted buff-white breast which becomes pale orange on lower breast and flanks, with white belly to vent. Juvenile is like female, but with orange-buff spotting and streaking above, more extensive spotting and less orange below. Voice. Song, commonly from treetop, a series of short (3–4 seconds) loud variable phrases, each of which generally in two parts, first several quickly repeated whistled notes, then one or several higher-pitched trilled notes, "tvet-tvet-tvet qui-qui-qui tviu-tviu-tviu-tve, tevetii-tevetii-tevetii kyuu-qwo tvii-tvii-tvii, trrryuuu trevtii-trevtii-trevtii"; regarded as pure and superlative. Calls include soft low chuckle, harsh "chack-chack", and shrill "tsee" or "chee" in alarm.
Habitat. Dense broadleaf evergreen forest, open deciduous forest (thin oak woods and pine–hornbeam forests), bottomland vegetation along rivers and streams, floodplain thickets and second growth; in low mountains and hills up to 1100 m.
Food and Feeding. Insects, snails and fruit. Commonly forages on ground, scratching in leaf litter.
Breeding. May to mid-Aug; double-brooded. Nest a cup of grasses and mud, lined with dry stems, placed low down in fork of thin branches of small tree (apple, birch), once in hole. Eggs 3–5, pale greenish with russet spots and pinkish-lilac clouds; in captivity, incubation period 12–13 days, nestling period 12 days, young left nest not fully capable of flight.
Movements. Migratory; winters in SE China and N Vietnam. Autumn departure from breeding grounds Sept. Main autumn passage (small numbers only) at Beidaihe, in NE China, early Oct; usual dates in Hong Kong mid-Nov to early Apr, and elsewhere in China winter arrival Nov, with last spring departures in early May; latest date in Shanghai 1st May. Spring arrivals in Russia late Apr, but passage continues to at least mid-May. Accidental in Japan and irregular passage migrant in Taiwan.
Status and Conservation. Not globally threatened. Common breeder in Russia and China; rare breeding species in N Korea, and uncommon and local in S Korea. In non-breeding areas, fairly common in S China, including Shanghai area, and common to abundant in Hong Kong; uncommon to fairly common in N Vietnam.
Bibliography. Anon. (2000a), Austin (1948), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Flint *et al.* (1984), Gore & Won Pyongoh (1971), Herklots (1967), Ishizuka & Tei (2004), Lee Woo-Shin *et al.* (2000), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Peterson *et al.* (2003), Pohl & Kämpfer-Lauenstein (2001), Robson (2000), Sowerby (1943), Tomek (2002), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

54. Black-breasted Thrush

Turdus dissimilis

French: Merle à poitrine noire **German**: Schwarzbrustdrossel **Spanish**: Zorzal Pechinegro
Other common names: Grey-backed Thrush(!)

Taxonomy. *T.(urdus) dissimilis* Blyth, 1847, lower Bengal, India.
Has been thought to form a superspecies with *T. unicolor* and *T. hortulorum*; formerly considered conspecific with latter. Monotypic.
Distribution. NE India, Myanmar and S China (Yunnan and W Sichuan E to Guizhou and Guangxi); non-breeding also Bangladesh, N Thailand and N Indochina.



Descriptive notes. 22–23·5 cm. Male is black on head to nape and breast, slate-grey on rest of upperparts, orange on belly and flanks, white on lower belly to vent; bill, narrow eyering and legs orange-yellow. Female is grey-brown from head below eye to tail, buff on diffuse submoustachial and throat, dark brown on malar spreading into spotted breastband; rest of underparts as male. Juvenile is as female, but finely spotted and streaked on head to scapulars, double orange-spotted wingbars, spotting below extending to paler orange flanks. Voice. Song very melodious, a series of short, spaced-out, leisurely phrases of 3–8 loud, variable notes, probably involving some mimicry, "tiu-tiu wiit... tiu-tiu-tiwi... pieu-pieu-pieu twi... wui-ui'ui-tri-tri...". Call a rich staccato "tuc-tuc-tuc" or "chup-chup-chup..." and a thin "seee".
Habitat. Breeds in oak and conifer forest (including open pine woods), broadleaf evergreen forest and second growth, at 1200–2500 m; 1200–1700 m in China. Winters in scrub-jungle and mangroves, from sea-level to foothills at c. 400 m; in Thailand, only above 1000 m.
Food and Feeding. Insects, molluscs and berries. Forages mainly on ground, but also visits fruiting trees; rather solitary.
Breeding. Apr–Jul in India, Apr–Jun in Myanmar and May–Jun in China. Nest a sturdy cup of green moss and fibres, placed 1–6 m up usually in fork of small tree or shrub, occasionally on ground or in hole in bank. Eggs 3–4, cream, buff, pale green or greenish-blue, with brown, lilac and/or reddish-brown or purplish-brown spots and blotches.
Movements. Resident, with seasonal vertical movements; some longer-distance migrations, but very poorly documented.
Status and Conservation. Not globally threatened. Formerly considered Near-threatened because of habitat loss. Scarce in NE India; rare to fairly common in China. Uncommon to fairly common in Myanmar, common in Chin Hills. In non-breeding season, scarce to uncommon (rare and irregular) in NW Thailand, Laos and N Vietnam.
Bibliography. Ali & Ripley (1987b), Cheng Tsohsin (1987), Clement & Hathway (2000), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Thewlis *et al.* (1998), Zheng Guangmei & Zhang Cizu (2002).

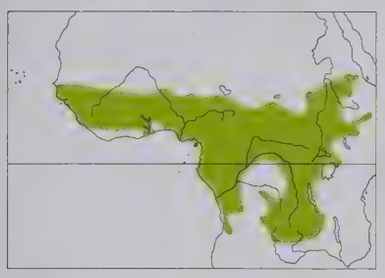

ssp pelios
ssp stormsi
ssp olivaceus
ssp deckeni
55
56
ssp baraka
ssp oldeani
ssp nigrilorum
ssp chiguancoides
PLATE 56
ssp roehli
inches 4
cm 10
57
58
♀
♂
59
60
ssp verreauxi
61
ssp libonyanus
63
ssp bewsheri
62
ssp comorensis
ssp migratorius
♂
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64
ssp confinis
♂
ssp moheliensis
ssp nigrideus
♂

55. African Thrush

Turdus pelios

French: Merle africain **German**: Afrikadrossel **Spanish**: Zorzal Africano
Other common names: West African Thrush (W races); Cameroon Mountain Thrush (*nigrilorum*); Fernando Po Thrush (*poensis*)

Taxonomy. *Turdus pelios* Bonaparte, 1850, Fazughli, Sudan.
Taxonomy complex and not fully understood. Has been thought to form a superspecies with *T. tephronotus* and *T. libonyanus*. Races *chinguancoides*, *nigrilorum*, *poensis* and *centralis* have in the past been treated as races of *T. olivaceus*, and the first two along with *saturatus* have sometimes been placed with *T. libonyanus*; *bocagei*, *graueri* and *stormsi* have also been placed with *T. olivaceus*. Situation still not adequately resolved; further research required. Proposed race *adamauae* (N Cameroon) considered indistinguishable from nominate, and *williami* (N Zambia) merged with *stormsi*. Nine subspecies recognized.
Subspecies and Distribution.
T. p. chiguancoides Seebohm, 1881 – Senegal E to N Ghana.
T. p. saturatus (Cabanis, 1882) – W Ghana E to C Cameroon, W PRCongo and Gabon.
T. p. nigrilorum Reichenow, 1892 – Mt Cameroon (Cameroon).
T. p. poensis Alexander, 1903 – Bioko (Fernando Póo).
T. p. pelios Bonaparte, 1850 – E Cameroon E to Sudan, W Eritrea and W, C & E Ethiopia.
T. p. centralis Reichenow, 1905 – E PRCongo and S Central African Republic E to S Ethiopia, W Kenya and NW Tanzania.
T. p. bocagei (Cabanis, 1882) – W DRCongo and NW & W Angola.
T. p. graueri Neumann, 1908 – E DRCongo, Burundi, Rwanda and W Tanzania.
T. p. stormsi Hartlaub, 1886 – SE DRCongo, E Angola and N Zambia.



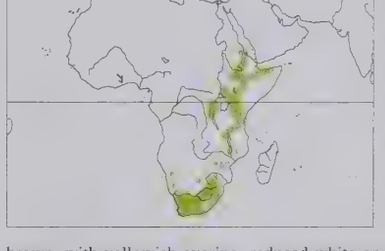
Descriptive notes. 21–23 cm; 46–78 g. Nominate race is dull brownish-grey from head below eye to tail, with pale buff-white flecks on cheeks, white throat with irregular buff-grey streaks, buff-grey breast, pale orange flanks, and white from mid-belly to vent; central underwing pale orange; dull orange eyering; bill yellow; legs flesh-brown. Differs from *T. olivaceus* mainly in being duller, lankier and leaner, with longer, less orange bill. Sexes similar. Juvenile is like adult but browner, with orange streaks above and spots on wing-covert tips, whitish below, with spotting on belly and patches of orange-buff on breast and flanks and grey on breast side. Race *chiguancoides* is more olive above and below, no obvious orange on flanks; *saturatus* is slightly darker above; *nigrilorum* is browner above, with strong streaking on throat; *poensis* resembles previous, but more olive above, greyer below; *bocagei* is grey-tinged above, throat streaks thin, deeper orange on flanks extending across lower breast; *centralis* is rather darker than nominate and more heavily streaked on throat; *stormsi* is variable, usually dark brownish-olive above, deep orange below except for streaked buffish throat, olive-washed breast, pale vent; *graueri* resembles last but generally paler on breast, paler central belly, also variable. Voice. Song, all year but less in dry season, and mainly at dawn and dusk, a sustained series of short, rather fast phrases consisting of simple, melodious single or double notes (when double, one note generally higher than other), each phrase repeated 2–5 times, "wii-puu wii-puu, puu-lii puu-lii puu-lii, wii-pyu-lii wii-pyu-lii, chit chit chit, wuu-yii-pur wuu-yii-pur…"; may continue for more than 30 minutes; considered more varied than that of *T. olivaceus*, and lacks latter's pauses and softer terminal notes. Mimics other species. Call a hard "chuk", often becoming dry trilling "chukukukukuk…"; also sharp whistled "sri"; high, thin downslurred squeak in alarm.
Habitat. Open deciduous woodland often near watercourses, riparian woodland, also thickets, savanna and evergreen woodland, copses in ravines, secondary forest, dry coastal bush, forest edge, clearings, farmland, orchards, parks, gardens, villages; occasionally mature primary forest and, in Sierra Leone, copses above 1440 m and at upper edges of forest. Frequents thick bush and undershrub, perching in small trees and bushes. Sea-level to 2060 m in Nigeria and to 1500 m in Cameroon, but 500–3000 m (mainly above 1300 m) on Mt Cameroon, and on Mt Oku (now Kilum) significant preference for higher-altitude open forest above 2400 m, and significant avoidance of heavily disturbed forest-edge habitat; from 1100 m to peak on Bioko; at least 1740 m in DRCongo; to 2130 m in Angola; to 1830 m in S Sudan; 700–2000 m in Uganda. Where sympatric with *T. olivaceus*, favours drier, lowland wooded areas mainly below 1660 m, while latter prefers wetter, montane forest above 1700 m; where sympatric with *T. libonyanus*, favours heavier evergreen and riparian woodland, while latter prefers drier woodland and savanna.
Food and Feeding. Insects, including termites, beetles, harvester ants, pupae, locusts; also earthworms, snails, millipedes, small fish; berries (*Rauwolfia*, *Loranthus*), fruits (*Azadirachta indica*, figs, papaya), acacia flowers, seeds. Of twelve stomachs from DRCongo, ten held fruits, berries or seeds of fruits, three had several small red peppers, five had beetle larvae, caterpillars and termites, and two had millipedes. Forages in early dawn and late dusk, on ground, by turning over leaf litter; sometimes gathers in trees to eat fruit; comes to water in near-dark. Occasionally follows safari ants (*Dorylus*) and may then make aerial sallies to catch flushed insects. Apparently cracks *Pila* snails against stones.
Breeding. Season mainly Jun–Oct in W Africa, but nestlings in Feb in Ghana, Apr–Sept in Nigeria and Jan, Mar–Sept and Dec (but mainly wet season) in Cameroon; Nov–Mar on Bioko; mainly Aug–Oct (also singing Nov–Jan and food-carrying Jan) in Gabon; mainly Sept–Dec in Angola, all months in DRCongo and probably Jun and Aug in Central African Republic; Jan–Aug in Sudan, young in Aug in Eritrea, Apr–Jul in Ethiopia; all year in Uganda, with strong peak in Mar; Apr in Kenya; at least Feb, Sept and Nov–Dec in Zambia; sometimes double-brooded. Nest a large neat cup of moss, grass, stems, leaves and mud, placed 1–9 m up in fork of tree such as *Harungana*, *Dracaena*, *Musanga*, *Erythrina*, *Acacia*, *Ficus* or *Cassia*, or in *Borassus* palm, *Veronia* shrub or clump of lianas, once on top of tent peg; old nests sometimes reused, or old nest of e.g. mannikin (*Lonchura*) or Laughing Dove (*Streptopelia senegalensis*) used. Eggs 1–4, usually 2–3, pale bluish-green or bluish-white, with fine rufous spotting; further details sketchy.
Movements. Mainly sedentary. Partial migrant in N of range in Gambia (commonest Jun–Sept); in Mali, some move N in wet season; in Ghana (Mole National Park) and N Nigeria numbers increase in wet season, and present in flocks in dry season in Ibadan; commonest in Jul (wet season) in Chad; in Sudan possibly wet-season (summer) visitor. Wanders locally in Ethiopia and possibly Kenya.
Status and Conservation. Not globally threatened. Widespread and fairly common to common. Abundant on Bioko; fairly common in Sudan; very common in Itombwe Mts, in E DRCongo. Density around villages in Gabon 3–5 pairs/10 ha (territory size 2–3 ha). Present in Lake Nakuru National Park, in Kenya.
Bibliography. Aspinwall & Beel (1998), Barlow *et al.* (1997), Beals (1970), Benson (1969), Borrow & Demey (2001), Britton (1980), Brosset & Érard (1986), Brown & Britton (1980), Butler (1905, 1908), Cave & MacDonald (1955), Chapin (1953), Cheesman & Sclater (1935), Clement & Hathway (2000), Dean (2000), Dowsett & Prigogine (1974), Elgood *et al.* (1994), Gatter (1997), Goodman & Goodman (1985), Jensen & Kirkeby (1980), Lewis & Pomeroy (1989), Lippens & Wille (1976), Nikolaus (1987), Pérez del Val (1996), Pomeroy (1993), Prigogine (1971), Sclater & Mackworth-Praed (1918), Serle (1957, 1962), Sharland & Wilkinson (1981), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Stuart (1986), Stuart & Jensen (1986), Urban *et al.* (1997), Walsh & Walsh (1983), White (1961a), Wilkinson & Beecroft (1985), Willis (1986), Wilson (1987), Zimmerman *et al.* (1996).

56. Olive Thrush

Turdus olivaceus

French: Merle olivâtre **German**: Kapdrossel **Spanish**: Zorzal Oliváceo
Other common names: Northern Olive Thrush (N races); Abyssinian Thrush (*abyssinicus*); Karoo Thrush (*smithi*), Oldean's Thrush (*oldeani*); Roehl's Thrush (*roehli*); Swynnerton's Thrush (*swynnertoni*)

Taxonomy. *Turdus olivaceus* Linnaeus, 1766, Cape of Good Hope, South Africa.
Taxonomy complex and not fully understood. Commonly considered conspecific with *T. helleri* and *T. ludoviciae*; also, most races of *T. pelios* have in the past been included within present species. Hybridization with *T. libonyanus* claimed in Zimbabwe and South Africa. Recent morphological and molecular analyses suggest that race *smithi* possibly a separate species, but further evaluation required in view of lack of clarity over plumage characters and nature and extent of a hybrid zone with parapatric nominate race. N assemblage of races, centred on *abyssinicus*, may also warrant treatment as a distinct species, but further study needed. Proposed race *mwaki* (described from W Turkana, in Kenya), which implicitly also includes *porini* (replacement for *fuscatus*, described from N Nandi Forest, in Kenya), considered indistinguishable from *abyssinicus*. Fourteen subspecies recognized.
Subspecies and Distribution.
T. o. abyssinicus J. F. Gmelin, 1789 – Eritrea and Ethiopia S to Sudan, N Uganda, N, W & C Kenya and N Tanzania (S to Loliondo).
T. o. deckeni Cabanis, 1868 – N Tanzania (Kilimanjaro S to Monduli).
T. o. oldeani P. L. Sclater & Moreau, 1935 – Mbulu and Crater Highlands, in N Tanzania.
T. o. baraka (Sharpe, 1903) – E DRCongo (Virunga Park) and W Uganda (Ruwenzori Mts).
T. o. bambusicola Neumann, 1908 – E DRCongo, Burundi, Rwanda, SW Uganda and NW Tanzania.
T. o. roehli Reichenow, 1905 – NE Tanzania.
T. o. nyikae Reichenow, 1904 – E & S Tanzania, N Malawi and NE Zambia.
T. o. milanjensis Shelley, 1893 – S Malawi and NW Mozambique.
T. o. swynnertoni Bannerman, 1913 – E Zimbabwe and W Mozambique.
T. o. transvaalensis (Roberts, 1936) – NE South Africa and W Swaziland.
T. o. smithi Bonaparte, 1850 – S Namibia, SE Botswana and N South Africa (Northern Cape E to Free State and SW former Transvaal).
T. o. olivaceus Linnaeus, 1766 – SW South Africa (Western Cape).
T. o. culminans Clancey, 1982 – E South Africa (W KwaZulu-Natal).
T. o. pondoensis Reichenow, 1917 – SE South Africa (E KwaZulu-Natal, Eastern Cape).



Descriptive notes. 20–24 cm; 49–98 g. Nominate race is dark olive-tinged grey-brown above; whitish throat with strong dark brown streaks, olive-grey breastband, dull orange belly to vent, white undertail-coverts with dark tips; bill yellow to yellow-orange; legs yellowish-brown. Differs from similar *T. pelios* mainly in darker coloration, extensive and deeper orange below (in most races), usually more orange bill. Sexes similar. Juvenile is like adult, but streaked above, with pale spots on wing-coverts, paler with heavy spotting below. Races vary slightly in colour tones: *abyssinicus* is less olive than nominate, slightly paler brown, with yellowish eyering, reduced white on throat; *oldeani* is like previous, but greyer on breast, and orange heavily suffused with grey; *deckeni* is richer and darker above than nominate, throat greyish-brown with finer streaks; *roehli* resembles last, but head darker and greyer, belly white; *bambusicola* has throat and breast more extensively ashy, lower belly whiter; *baraka* has lower breast to belly and flanks deep chestnut; *milanjensis* is darker above than nominate, with throat buffier, belly paler; *nyikae* is similar to previous, but darker below; *swynnertoni* is also similar, but richer brown above; *smithi* is greyer and paler than nominate, with finer throat streaks; *pondoensis* is more olive-tinged above, more orangey below; *culminans* is like previous, but lacks olive wash above, darker and browner below; *transvaalensis* is darker than last, more olive above and more ochreous below. Voice. Song (in E Africa) a series of unhurried, deliberate, short phrases of 5–8 clear, pleasant, typically alternating high and low notes, usually followed by short, quieter, tuneless notes or hissing trill, "tyuu-tii-tyuu-tii-tyuu-tii… titiitrrrrrri", each phrase lasting 2·5–3·5 seconds although sometimes elided into longer bouts. Some songs have distinct reeling quality, "rrriiiii-rriiiiiitu-iiiiiii…", and at dawn has short rolling reedy song, "trrrip-trriiiit", whereas midday song a sweet high "swii-turr-tii-turr", etc., repeated at intervals. In S Africa quality of phrases more hurried and warbled, often without the coda; said to duet. Occasionally includes mimicry. Calls include sharp "chink", soft "chk-chk-chk", harder guttural "gew" or "gew-gew" and scolding "tsrk tsrk"; also "wheet", "chook" or thin "tsey".
Habitat. Mainly highland forest of various types (including *Hagenia*), primary, secondary, gallery and riverine forest, edges, clearings, bamboo, giant heath, scrub and even (Burundi) moorland; in

On following pages: 57. Taita Thrush (*Turdus helleri*); 58. Somali Thrush (*Turdus ludoviciae*); 59. Bare-eyed Thrush (*Turdus tephronotus*); 60. Kurrichane Thrush (*Turdus libonyanus*); 61. Yemen Thrush (*Turdus menachensis*); 62. Comoro Thrush (*Turdus bewsheri*); 63. Gulf of Guinea Thrush (*Turdus olivaceofuscus*); 64. American Robin (*Turdus migratorius*).

S parts of range also in lowland woodland, bushveld, exotic plantations, dense unburnt fynbos, gardens (especially during dry season in arid regions), parks and *Acacia* thornbush along karoo semi-desert watercourses. Occurs from 900 m to 3200 m (mainly above 1500 m) in Ethiopia, mainly 1830–3350 m and up to 5000 m (limit of glaciers) in Ruwenzori Mts (*baraka*), above 1830 m in Sudan, 950–2300 (mainly 1100–1830) m in Tanzania, 1600–2450 m in Malawi, mainly 900–2200 in Zimbabwe; in much of South Africa (if sympatric with lowland *T. libyonanus*) above 800 m. Where it meets *T. pelios*, favours higher, wetter habitats than latter.

Food and Feeding. Wide range of animal and vegetable foods. Animal food includes great variety of insects (beetles, moths, caterpillars, grasshoppers, mantids, emerging termites, pupae and grubs), earthworms, snails, slugs, spiders, small bivalves, small lizards (including chameleons), small fish, and nestling birds. Vegetable material includes fruits of lianas, *Cotoneaster*, *Olea africana*, *Celtis*, *Rapanea*, *Afrocrania volkensis*, *Myrica salicifolia*, *Syzygium guineense afromontanum*, *Climedia*, *Bridelia*, *Ilex*, *Polyscias*, *Rytigynia*, *Schefflera*, *Trema*, *Urera*, *Rhus*, *Diospyros*, introduced *Acacia cyclops*, mulberry, apricot, peach, grape, plum, pea, date and strawberry. Stomachs of 16 birds taken throughout year in Free State (South Africa) held by number 61% berries, 28% seeds, 6% beetles, 3% lepidopterans and ants, and 2% plant parts. Forages on open ground and in shaded cover, flicking leaf litter with bill and scratching it with feet. Follows safari ants to take disturbed invertebrates.

Breeding. Jul–Aug in Eritrea, Dec–Jan and Mar–Aug in Ethiopia and Jan–Apr in Sudan; Oct–Jul (peak Mar–Jun, above 2200 m mainly Dec–Apr and Sept) in Kenya, Feb–Mar, Jun–Jul and Nov in Uganda, and Aug in Tanzania; all year in DRCongo; Mar–May and Oct–Dec in Rwanda and Sept–Dec in Malawi; Sept–Dec in Angola, to Mar in Zambia and to Jan in Zimbabwe; Nov–Jan in Mozambique; Oct–Nov in Botswana; in South Africa, Aug–Mar (peak Sept–Nov) in NE, Sept–Jan in E, and all months (peaks in Aug–Nov and Feb–Apr) in Western Cape; sometimes double-brooded. Territory size variable, pair capable of breeding in 0·5-ha copse in Malawi, but average territory 16 ha in SW South Africa. Nest a large untidy cup of small twigs, rootlets, bark, grass, moss, lichen, leaves and bracken (nests in forest typically mainly of moss), mixed with mud, lined with fine grass and rootlets, placed c. 2–5 m up in fork in tree, bush, or climber on trunk or house; nest takes c. 10 days to build, dry materials may be dipped in water before incorporation. Eggs 1–4 (mainly 2–3), bluish to pale green with yellowish-brown and reddish-brown and purplish markings; incubation period 14 days; nestling period 16 days, young capable of flight a few days later. Occasionally parasitized by Red-chested Cuckoo (*Cuculus solitarius*), e.g. 0·14% of 692 nests in S Africa. Nesting birds attacked by Wahlberg's Eagle (*Aquila wahlbergi*), White-browed Coucal (*Centropus superciliosus*) and Laughing Dove (*Streptopelia senegalensis*).

Movements. Sedentary in most of range, but some altitudinal movements. In Namibia, influx into Naukluft Mts, Jul–Sept; in South Africa, appears Barberspan and coastal regions of KwaZulu-Natal May–Sept, also wanders to E lowveld, and elsewhere may move locally in response to drought. In Zimbabwe limited winter movement to E lowlands, 350–750 m.

Status and Conservation. Not globally threatened. Generally common throughout large latitudinal range, and sometimes abundant, e.g. at lower elevations in Eritrea, and parts of Burundi. Rare in Namibia, where doubtless at edges of tolerance to dry conditions. Greatly expanded its range in South Africa between 1930s and 1980s, and may breed at high densities in suburban areas, e.g. 36 pairs in 3·5-ha park in Cape Town, where another study found similar average territory size of 0·14 ha. In Kenya, seven times commoner in primary forest than in coniferous.

Bibliography. Anderson & Oosthuysen (1997), Belcher (1925), Bennun (1989), Benson (1946a), Benson & Benson (1977), Bonnevie *et al.* (2004), Bowie *et al.* (2003), Boyer & Bridgeford (1988), Britton (1980), Brown & Britton (1980), Carlson (1986), Cave & MacDonald (1955), Chapin (1953), Cheesman & Sclater (1935), Clancey (1982b), Clement & Hathway (2000), Douglas (1995), Dowsett (1985b, 1990), Dowsett-Lemaire (1989), Eisentraut (1970, 1973), Fraser (1989), Grobler (1998), Harrison *et al.* (1997), Harwin *et al.* (1994), Hewitt (1962), Irwin (1960, 1981), Jensen & Jensen (1969), Johnson, D.N. & Maclean (1994), Johnson, P.M. (1987), Keith & Urban (1992), Kopij (2000, 2003), Kuiper (1998), Kuiper & Cherry (2002), Lippens & Wille (1976), Liversidge (1965), Maclean (1993), Martin (1984), Middlemiss (1955), Ng'weno (1986), Nikolaus (1987), Prigogine (1971), Rensch (1923), Romeyn (1975), Sanders *et al.* (1997), Sinclair (1984), Sinclair & Ryan (2003), van Someren (1956), Steyn (1985, 1996), Swynnerton (1908), Tarboton (2001), Tarboton *et al.* (1987), du Toit (1981), Tree (1967), Tyler (1987), Urban (1975), Urban *et al.* (1997), White (1961a), Whitelaw (1983), Willis (1985), Winterbottom, M.G. (1966), Zimmerman *et al.* (1996).

57. Taita Thrush

Turdus helleri

French: Merle des Teita **German**: Taitadrossel **Spanish**: Zorzal de los Taita

Taxonomy. *Planesticus helleri* Mearns, 1913, Mount Mbololo, east of Mount Kilimanjaro, south-eastern Kenya.

Commonly treated as a race of *T. olivaceus*, in part because of anomalous geographical position within latter's range. Monotypic.

Distribution. Taita Hills, in SE Kenya.



Descriptive notes. 20–22 cm; 53–89 g. Head and throat black, upperparts blackish-grey; breast dark grey, centre of belly white, with sides dark rufous; bill, narrow eyering and legs orange-yellow. Rather similar to *T. olivaceus roehli* but head, throat, breast and upperparts much darker. Sexes similar. Juvenile is like juvenile *T. olivaceus*, but darker above, paler below. Voice. Song reportedly similar to that of *T. olivaceus*, with latter's quiet hissing notes at end of each phrase, but richer and slower; given from concealed position in middle levels, notably in twilight; often sings in mid-flight. Contact call a thin high-pitched "tseee", alarm a soft "chook".

Habitat. Montane cloudforest, at 1615–1740 m; prefers well-shaded areas with dense understorey, rich leaf litter and minimal herb layer. Absent from adjacent second growth, plantations, scrub and farmland.

Food and Feeding. Variety of invertebrates, taken from forest floor; also, when in season, fruits, especially those of *Canthium oligocarpum*, *Rapanea melanophloeos* and *Xymalos monospora*, as well as *Allophylus abyssinicus*, and *Maesa lanceolata*. Forages commonly in leaf litter, and usually seen less than 2 m above ground. In Mbololo and Ngangao, congregates at dusk at places where there is water.

Breeding. Jan–Jul; breeding condition also in Nov. Socially monogamous. Nest a woven cup of twigs and skeletal leaves (from litter), external covering of moss for camouflage, placed in fork of tree, with possible preference for trees covered by forest climbers. Eggs 1–3, light blue with rufous-brown spots; incubation period likely to be 14–15 days. No further information available.

Movements. Highly sedentary, even within forest patches.

Status and Conservation. CRITICAL. Restricted-range species: present in Tanzania–Malawi Mountains EBA. Global total of c. 1350 individuals within occupied range of less than 3·5 km². Confined to three tiny fragments of forest, at Mbololo (200 ha), with 1060 individuals, Ngangao (92 ha), with 250, and Chawia (50 ha), with 38, and with records from Yale (2 ha) involving an unspecified number but clearly only a few. Chawia found to have a highly skewed sex ratio of 10 males to 1 female, which (especially if reflected elsewhere) may affect reproductive output and long-term survival. Density in least disturbed fragment (Mbololo) c. 5 birds/ha; in most disurbed (Chawia, with open canopy and well-developed shrub layer) less than 1 bird/ha. Absence of movement of individuals from one fragment to another a matter of concern, as likely to lead to inbreeding. Survival rates lowest in the most disturbed fragment, with average life expectancies 1·4 (±2·4) years at Chawia, 2·6 (±2·3) years at Ngangao, and 3 (±2·2) years at Mbololo; birds in most disturbed fragment show highest rates of asymmetry in morphology, presumably reflecting environmental stress. Kenya Forest Department now seeks to safeguard these remaining forest fragments, which until recently were under threat from uncontrolled clearance for farmland, fuelwood and non-native reforestation (which has destroyed all other areas in Taita Hills), and there is an ongoing research project to establish the scientific basis for optimal long-term management of the area for biodiversity. Greater involvement of and economic benefits to local communities still needed, and programme of reforestation with indigenous trees planned. A 1950s report from Mt Kasigau, 50 km SE of Taita Hills, has never been confirmed.

Bibliography. Barnes *et al.* (1999), Bednall (1958), Brooks (1997), Brooks *et al.* (1998), Clement & Hathway (2000), Collar & Stuart (1985), Githiru *et al.* (2002), Lens & van Dongen (1999, 2002), Lens, Adriaensen & Matthysen (1999), Lens, van Dongen, Galbusera *et al.* (2000), Lens, van Dongen & Matthysen (2002), Lens, van Dongen & Norris (2002), Lens, van Dongen, Wilder *et al.* (1999), Lens, Galbusera, Brooks *et al.* (1998), Mayr & Paynter (1964), Samba *et al.* (2004), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Tetlow (1987), Urban *et al.* (1997), Waiyaki & Samba (2000), Waiyaki *et al.* (2001), Zimmerman *et al.* (1996).

58. Somali Thrush

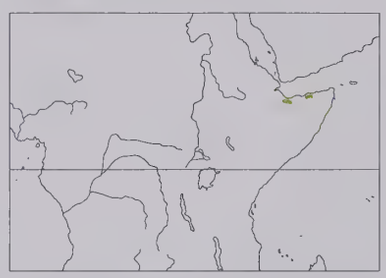
Turdus ludoviciae

French: Merle de Somalie **German**: Somalidrossel **Spanish**: Zorzal Somalí
Other common names: Somali Blackbird

Taxonomy. *Merula lodoviciae* E. L. Phillips, 1895, "Darass", Somalia.

Evidently close to *T. olivaceus* and commonly treated as conspecific. Monotypic.

Distribution. N Somalia.



Descriptive notes. 23 cm; 62 g. Male is slate-grey, blacker on crown, face and throat, paler on breast to belly; undertail-coverts tipped greyish-white, underwing-coverts tinged orange-buff; bill, eyering and legs yellow. Female is slightly browner on head, with chin and throat streaked blackish, becoming pale grey on breast. Juvenile is paler grey, spotted and streaked greyish-buff above, mottled greyish-buff below, bill dark. Voice. Song reportedly similar to that of *T. olivaceus*, but alarm chatter harsher.

Habitat. Juniper (*Juniperus procera*) woodland and adjacent open areas in mountains, at 1300–2000 m. Seen in citrus orchard in Nov, presumably moving between juniper patches.

Food and Feeding. Juniper berries. Often forages in small parties, and in loose groups of up to 30 at berry crops.

Breeding. May and Jul. Eggs 2. No other information.

Movements. Evidently sedentary; records of groups at berry crops suggest some short-distance movement.

Status and Conservation. CRITICAL. Restricted-range species: present in North Somali Mountains EBA. Global puplation estimated in 2000 at 2500–10,000 mature individuals, but with very high decline rate in preceding decade. Credible report of extensive clearance of habitat in 1998. Main hope must be that Daloh Forest Reserve, where the species was common in 1979, was spared clearance, but even that was suffering extensive erosion from cattle grazing, burning and felling in 1970s. Political situation in Somalia in recent decades has been unfavourable to survey work or conservation initiatives, and is thus itself a threat.

Bibliography. Archer & Godman (1937–1961), Ash & Miskell (1998), Clarke (1985), Collar & Stuart (1985), Dowsett & Forbes-Watson (1993), Hall & Moreau (1970), Mayr & Paynter (1964), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Urban *et al.* (1997).

59. Bare-eyed Thrush

Turdus tephronotus

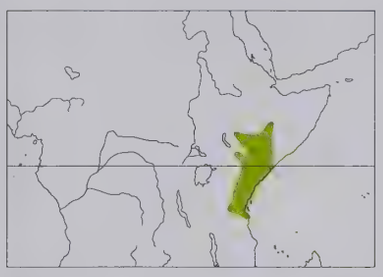
French: Merle cendré **German**: Brillendrossel **Spanish**: Zorzal Ceniciento
Other common names: African Bare-eyed Thrush

Taxonomy. *Turdus tephronotus* Cabanis, 1878, Tiva River and Ndi, Taita, Kenya.

Has been thought to form a superspecies with *T. pelios* and *T. libonyanus*. Monotypic.

Distribution. S Ethiopia, S Somalia, C & E Kenya and NE Tanzania.

Descriptive notes. 20–21·5 cm; 45–55 g. Head to breast medium grey, upperparts dark grey; throat white, streaked blackish; belly orange; striking broad, bare yellowish-orange eye patch, bill orange, yellower basally; legs pale orange. Sexes similar. Juvenile is like adult, but browner with buff-brown spots and streaks above, extensively spotted and with little grey below, eye patch duller. Voice. Song rather short, fluty and plain, typically a series of 2 strong whistled notes and 2–3 weaker, faster notes either higher or lower in pitch, "quirrrrrr turr chik", "squirrrr-qyrrr tyip-tyip tu-tu-tu", "kewerr-kewerr s'liip-yii-iii" or "huu-huu-tsri-tsritsritsritsri"; similar to that of *T. olivaceus* but slower and louder, and usually incorporating diagnostic nasal, bubbling "pi-pu pi-pu pi-pu". Calls include loud liquid rattling "chrrrr", bubbling mellow "qu-qu-qu-qu" of 4–5 notes, soft whinnying, and, in alarm, a soft ventriloquial whistle or the nasal bubbling song component.



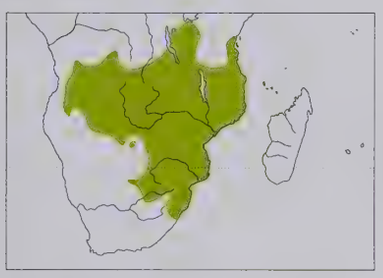
Habitat. Thorn-scrub, thickets, fairly thick bushland, *Commiphora* woodland, with predilection for rocks and also, at edges of range, areas near watercourses, mainly in semi-arid lowlands, but also orchards and other cultivated areas with thick vegetation. Recorded up to 1750 m in Kenya and Tanzania. Occurs in drier habitats than those in which *T. pelios* found.
Food and Feeding. Mainly insects, especially caterpillars, beetles and flies; also fruits, berries and seeds. Forages mainly on ground, usually under thick cover, by tossing aside leaf litter.
Breeding. Mainly in rains; May in Somalia, elsewhere Mar–Jun and Nov–Dec, depending on each region. Nest is an open cup of twigs, grasses, roots and leaves, placed in tree or bush. Eggs 2–3, pale bluish-green with grey or violet smudges and dark rufous spots. No further information available.
Movements. Chiefly sedentary, although some suggestion of wandering; recorded S to SE Tanzania.
Status and Conservation. Not globally threatened. Patchy and local in Ethiopia and Somalia; common but local in Kenya, commonest in coastal lowlands; locally common in Tanzania. Present in Tsavo East National Park, in Kenya, and Mkomazi Game Reserve, in Tanzania.
Bibliography. Ash & Miskell (1998), Benson (1946a), Britton (1980), Brown & Britton (1980), Clement & Hathway (2000), Fuggles-Couchman & Elliott (1946), Howell & Msuya (1979), Lack (1985), Lewis & Pomeroy (1989), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Urban *et al.* (1997), Zimmerman *et al.* (1996).

60. Kurrichane Thrush

Turdus libonyanus

French: Merle kurrichane **German**: Rotschnabeldrossel **Spanish**: Zorzal de Kurrichane

Taxonomy. *Merula libonyanus* A. Smith, 1836, near Kurrichane, western Transvaal, South Africa. Has been thought to form a superspecies with *T. pelios* and *T. tephronotus*. Hybridization with *T. olivaceus* claimed in Zimbabwe and South Africa. Proposed race *chobiensis* (from N Botswana and W Zimbabwe) considered indistinguishable from *verreauxi*, and *peripheris* (E South Africa) from nominate. Three subspecies recognized.
Subspecies and Distribution.
T. l. tropicalis W. K. H. Peters, 1881 – SE Burundi and Tanzania S to C & E Zambia, Malawi, E Zimbabwe and Mozambique.
T. l. verreauxi Bocage, 1870 – Angola and SE DRCongo S to NE Namibia, W Zambia, N Botswana and W Zimbabwe.
T. l. libonyanus (A. Smith, 1836) – E & S Botswana E to S Mozambique, S to N & NE South Africa and Swaziland.



Descriptive notes. 21–23 cm; 46–82 g. Head to breast and upperparts medium grey; throat white, streaked blackish at sides; orange-rufous flanks, whitish centre of belly; eyering and postocular flange dull orange (not obvious in field); bill orange, yellower basally; legs variable in colour. Sexes similar. Juvenile closely resembles juvenile *T. pelios*, but greyer on head, more orange on flanks. Race *tropicalis* is slightly paler than nominate, with two indistinct wingbars formed by orange-buff spots; *verreauxi* is also paler, including on breast, legs yellow. Voice. Song a series of short but very variable phrases, some rich and warbling, others thin and sweet, commonly ending with high tuneless trill or hiss, "piiuu piiuu psst, wuudi wuudi wuudi, tyuu-wiit-wiit, wuyi wuyi tssst"; similar to that of *T. olivaceus*, but some notes shriller and phrases usually shorter. Sometimes involves mimicry. Call "pss-chu" or "tsi-tsiuu".
Habitat. Mainly miombo woodland, also *Baikiaeia* and acacia woodland (but not on Kalahari sands), open bushland, wooded rocky hillsides, euphorbia forest on steep slopes, riverine bush, forest edge, cultivated land, exotic plantations (especially *Eucalyptus*), parks and gardens; generally avoids mopane woodland, but occupies this habitat in W of range where miombo absent (e.g. Botswana). To 1900 m in E Africa and DRCongo, 1740 m in Zambia (on Nyika Plateau), 2200 m in Zimbabwe (in exotic trees) and 2200 m in Angola.
Food and Feeding. Mainly invertebrates, particularly insects, including beetles, grasshoppers, locusts, crickets, ants, grubs and caterpillars, last including those of mopane emperor moth (*Imbrasia belina*); also earthworms, molluscs, spiders, millipedes and small lizards; also fruits of *Rhus*, *Ficus* and avocados, and seeds. Moths and moth caterpillars, beetles, crickets and a slug all seen being fed to nestlings. Forages mainly on ground, by tossing aside leaf litter; also, rarely, hawks insect prey in air.
Breeding. Oct–Nov in Angola, Sept–Nov in Tanzania and Sept–Dec in DRCongo; Aug–Dec (mainly Sept–Nov), rarely Mar–Apr, in Zambia and Aug–Dec (peak Oct) in Malawi; Sept–Feb in Botswana, Aug–Mar (peak Sept–Nov) in Zimbabwe and Sept–Dec (also breeding-condition bird in Mar) in Mozambique; in South Africa, Sept–Feb (peak Oct–Nov) in N and Aug–Jan (peak Oct–Nov) in E (KwaZulu-Natal); sometimes two broods, occasionally three. Solitary breeder, territory c. 2 ha per pair in KwaZulu-Natal. Nest a large untidy cup of twigs, roots, grass, fresh leaves and moss, cobweb and extraneous items, sometimes fixed together with mud, usually lined with mud, rootlets, tendrils and dry grass, placed 1–10 m (usually 3–4 m) up in fork of large tree, against trunk, in epiphyte clump or on overgrown part of building; occasionally built on old nest of other bird, such as Laughing Dove (*Streptopelia senegalensis*), *Psophocichla litsitsirupa* or Fiscal Shrike (*Lanius collaris*); nest-building may be completed in single day, often after rain, and dry materials may be dipped in water before use; either first nest reused or new one built for subsequent broods. Eggs 1–4, usually 3, colour very variable, pale green to blue to pale brown, speckled and spotted pale reddish-brown to yellowish-brown; incubation period 12–14 days; nestling period 13–16 days; post-fledging dependence at least 2 months, fledglings may still be fed while second clutch being incubated. Parasitized by Red-chested Cuckoo (*Cuculus solitarius*), e.g. 0·31% of 1288 nests in S Africa. Of 356 nests in Zimbabwe, 104 produced fledglings (average 0·7 fledglings per breeding attempt), total of 249 fledglings from 956 eggs; predators of young include by Shikra (*Accipiter badius*) and Pied Crow (*Corvus albus*), eggs and young frequently eaten by primates, and eggs probably taken by boomslangs and galagos; heavy rainfall and pesticides (to control tsetse fly) also thought to cause nest failure. Oldest ringed bird at least 8 years.
Movements. Sedentary over most of range. Dispersal noted into SE Botswana Dec–Mar, and post-breeding movement from miombo into mixed woodland in Zimbabwe; in South Africa, occasional winter influxes to KwaZulu-Natal midlands, rarely into Northern Cape. In Zimbabwe, local movements associated with drought noted. One record from Lesotho.
Status and Conservation. Not globally threatened. Common in most of range; uncommon in Tanzania and parts of Mozambique, Malawi, Zimbabwe and Namibia. Rare at edges of range at higher elevations in S Africa, but has over the last century expanded its range considerably in this area. In Zimbabwe, density in miombo woodland 46 pairs/km², but only 1 pair/km² in nearby mixed woodland; densities in acacia woodland varied from 6·7 to 46·7 individuals/ km².
Bibliography. Anon. (1986), Bannerman (1953), Beasley (1993), Beesley & Irving (1976), Benson (1946a), Benson & Benson (1977), Benson *et al.* (1971), Britton (1980), Brooke (1986), Brown & Britton (1980), Campbell (1973), Chapin (1953), Chittenden (1982), Clancey (1965b), Clement & Hathway (2000), Cowgill & Davis (1994), Day (1987), Dean (2000), Elliott & Jarvis (1972–1973), Ginn *et al.* (1989), Grimes (1972), Hall (1983), Hanmer (1999), Harrison *et al.* (1997), Irwin (1981), Johnson & Maclean (1994), Keith & Urban (1992), Koen (1988), Kuiper & Cherry (2002), Lippens & Wille (1976), Lorber (1973), Macdonald & Birkenstock (1980), Maclean (1993), Masterson (1975), Masterson & Weaving (1975), Monadjem (2002a), Paolilo (1993), Parnell (1974, 1975), Paxton (1995), Penry (1994), Pitman (1961), Rensch (1923), Sinclair (1984), Sinclair & Ryan (2003), Skinner (1995), Stevenson & Fanshawe (2002), Steyn, D. (1998), Steyn, P. (1965), Steyn, P. & Brooke (1973), Styles (1995), Swynnerton (1908), Tarboton (2001), Tarboton *et al.* (1987), Traylor (1965), Urban *et al.* (1997), Vernon (1973, 1977, 1984, 1985), White (1961a), Whyte (1993), Williams (1988), Wilson (1978), Zimmerman *et al.* (1996).

61. Yemen Thrush

Turdus menachensis

French: Merle du Yémen **German**: Jemendrossel **Spanish**: Zorzal Yemení

Taxonomy. *Turdus menachensis* Ogilvie-Grant, 1913, Menacha, Yemen.
Monotypic.
Distribution. SW Saudi Arabia (S of 21° N) and W Yemen.



Descriptive notes. 23 cm; 72–79 g. Male is plain olive-brown above, paler and greyer below, with narrow dark brown streaks in regular lines radiating across buff-grey chin and throat onto breast, brown-tipped vent; bill and eyering yellow; legs dull flesh. Female is very similar but somewhat paler overall, buffier below, often with dark shaft streaks on belly and flanks, duller bill. Juvenile undescribed; immature has dark bill, buff tips to wing-coverts. Voice. Song, mainly at dawn, a musical series of high, fluty warbles, harder metallic sounds and high thin notes, e.g. fruity "treep-treep" followed by insipid "tsik-tsik". Call includes explosive "chck-chck" or "shee-ak" like that of *T. torquatus*, softer "chuk-chuk-chuk" like that of *T. pilaris* or *T. merula*, more metallic "shrrrd shrrrd chuck", chattering alarm, and thin high "psiiii".
Habitat. Dense cover of indigenous trees and shrubs (mainly acacia and juniper, also olive and wild rose), including woodlands, thickets, copses, cultivated wadis, tree-lined terraces, orchards and large gardens; enters adjacent open areas, but only once found in extensive fields of qat (*Catha edulis*). From 1200 m, mainly 1700, to 3100 m; at lowest elevations found in thick vegetation along watercourses.
Food and Feeding. Terrestrial invertebrates, including snails taken under acacia scrub, and fruits such as *Rosa*, *Juniperus*, *Olea* and *Ficus*. Forages on ground among dead and rotting vegetation.
Breeding. Mar–Aug. Nest a firm cup made of dry grass, small twigs, moss and thin bark strips, with mud interior lined with fine grass and rootlets, placed 1–4 m up in bush or in tree fork, usually in dense cover (juniper often used), or among vegetation on wall. Eggs 1–3 (apparently mostly 2), pale blue with reddish-brown blotches. No other information.
Movements. Generally sedentary; N populations may undertake short-distance altitudinal or latitudinal movements.
Status and Conservation. VULNERABLE. Restricted-range species: present in South-west Arabian Mountains EBA. Population judged small, 2500–10,000 individuals, and probably declining. Generally scarce throughout fairly extensive (c. 67,000 km²) but mostly unsuitable range, but occasionally numerous. Clearance and excessive exploitation of its montane woodland habitats are ongoing threats. In Yemen, and possibly also Saudi Arabia, trees and shrubs are lopped at unsustainable levels for fuel, fodder and building material; at lower levels, abandonment of cultivated terraces results in topsoil loss, erosion and a further reduction in wooded cover. Despite a good network of traditional reserves (*mahjur*) which protect fodder plants, including as insurance against drought, the advent of convenient supplemental feeds has undermined the management of such areas. Occurs in at least two protected areas, Raydah Reserve and Asir National Park, both in Saudi Arabia. New surveys and return to traditional fodder management needed.
Bibliography. Bowden (1987), Castell *et al.* (2001), Clement & Hathway (2000), Hollom *et al.* (1988), Jennings (1995), Jennings *et al.* (1988), Newton & Newton (1996), Phillips (1982), Porter *et al.* (1996), Stagg (1984), Stattersfield & Capper (2000).

62. Comoro Thrush

Turdus bewsheri

French: Merle des Comores **German**: Komorendrossel **Spanish**: Zorzal de las Comores
Other common names: Grand Comoro Thrush (*comorensis*); Moheli Thrush (*moheliensis*); Anjouan Thrush (*bewsheri*)

Taxonomy. *Turdus bewsheri* E. Newton, 1877, Anjouan Island, Comoro Islands.
Generally considered an offshoot of *T. olivaceus*, and race *comorensis* has similar song to that species; possibly also close to *T. olivaceofuscus*. Nominate race has been proposed as a separate on grounds of different song from *comorensis*, but *moheliensis* apparently intermediate between the two. Unpublished biomolecular studies of all three taxa tend to support a three-way split, although only nominate shows significant morphological differences. Further study needed. Three subspecies recognized.

Subspecies and Distribution.
T. b. comorensis Milne-Edwards & Oustalet, 1885 – Grand Comoro (Njazidja).
T. b. moheliensis Benson, 1960 – Mohéli (Mwali).
T. b. bewsheri E. Newton, 1877 – Anjouan (Ndzuani).



Descriptive notes. 22–24 cm; 57–68 g. Male nominate race is plain olive-brown above, with white chin and throat, buff-stippled white on adjacent submoustachial area, breast grey-tinged buff with vague darker brown tips, dark tips becoming irregular soft-edged spots and scales on white mid-belly to vent; bill dark brown; legs ochraceous-brown. Female is slightly browner, with broader or more uniform tips on breast and flanks. Juvenile is similar to adult, but more rufous with buffish streaks above, buffish mottling across breast. Race *comorensis* has light streaking on side of throat, plain underparts buffy-grey, shading to grey-ish on belly and darker on flanks, with more rufous undertail-coverts; *moheliensis* is very like previous, with finer, sharper and more extensive streaking on throat, bolder whitish streaks on ear-coverts, underwing-coverts whitish rather than bright russet. Voice. Song (nominate race) beautiful, rich and varied, consisting of different phrases, "chri-chri-chri", "richi-richi-richi", "teeu-teeu-teeu", "tiree-tiree-tiree", "kwiyi-kwiyi-kwiyi", "kwicher-chip-chip-chip-kwich"; *comorensis* has simple song consisting of a few disjointed slurred whistles. Alarm call of nominate a sharp "krrk", repeated up to four times; of *comorensis* a sharp "tchwit" (also a whistle); of *moheliensis* a "twit", repeated about every second.
Habitat. Woody areas. On Grand Comoro, most associated with forest on Mt Karthala from 500 m to upper limit of forest (c. 1850 m), occasionally higher (to 2050 m) in *Philippia* heath zone, and especially common at 1000–1250 m; also less commonly on La Grille, and locally below 500 m between Moroni and Mvouni. On Mohéli, similarly associated with forest above 400 m but present in wooded habitat, including ylang-ylang plantations, down to sea-level. On Anjouan, present in all wooded and semi-wooded areas above c. 700 m.
Food and Feeding. Seeds, fruit, small gastropods, spiders, millipedes, caterpillars, flies, hymenopterans, grasshoppers, beetles and doutbless other insects. Forages on ground or from tree branches; seen also to flutter in air to take fruit. Often joins mixed-species feeding flocks.
Breeding. Aug–Oct; juveniles seen in Feb, and pairs giving subsong in Apr. Nest a bulky cup of tendrils, lined with finer grass and covered externally with moss, placed in shrub or tree (e.g. within epiphytic fern, on banana-tree branch, on top of stump), usually at low to medium height, e.g. 3–5 m. Eggs 2, light blue, freckled and streaked reddish-brown and lavender-grey. No other information.
Movements. None known.
Status and Conservation. Not globally threatened. Restricted-range species: present in Comoro Islands EBA. Fairly common to common. Commoner on Mohéli than on Grand Comoro. Tolerant of forest degraded by establishment of banana plantations.
Bibliography. Benson (1960), Cheke & Diamond (1986), Clement & Hathway (2000), Herremans (1988), Louette (1988, 2004), Louette & Stevens (1992), Moorcroft (1996), Safford & Evans (1992), Stattersfield *et al.* (1998), Stevens *et al.* (1992).

63. Gulf of Guinea Thrush

Turdus olivaceofuscus

French: Merle de Sao Tomé **German**: Sao-Tomé-Drossel **Spanish**: Zorzal de Santo Tomé
Other common names: São Tomé Thrush, Olivaceous Thrush

Taxonomy. *Turdus olivaceofuscus* Hartlaub, 1852, São Tomé.
Has been thought to be closely related to *T. olivaceus*, *T. helleri*, *T. ludoviciae* and *T. bewsheri*. Race *xanthorhynchus* morphologically very distinctive, and vocal differences also reported; may warrant elevation to species rank. Two subspecies recognized.
Subspecies and Distribution.
T. o. xanthorhynchus Salvadori, 1901 – Príncipe.
T. o. olivaceofuscus Hartlaub, 1852 – São Tomé.



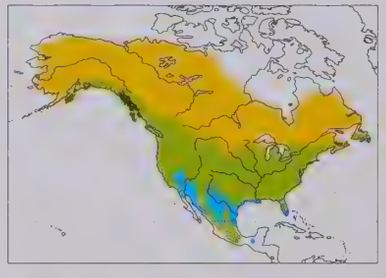
Descriptive notes. 24 cm; 77–92 g. Nominate race is dull olive-brown above from head below eye to tail, head slightly darker; dusky buff chin to throat with whitish streaks, dusky buff scales on buff-washed breast, shading to dusky-buff scalloping on whitish remaining underparts; underwing-coverts pale orange-buff against creamy secondaries; iris brown to red; bill large, dark, lighter yellowish tip; legs dark brownish-grey. Sexes similar. Juvenile is like adult, but lightly flecked buff above, heavily blotched brown below. Race *xanthorhynchus* is smaller than nominate, with darker, coarser and less even scaling below, more white on throat, no continuous breastband, striking yellow bill and legs. Voice. Song, most often given crepuscularly, an unhurried, rather rhythmic series of 3–5 mellow slurred whistles and several soft high hisses or trills, "tyuu tuuiiuu tiiuu tsss tsss… twii tuuiiuu tiiwo tuuii tuu tsss trrr trrr tsss…", etc., often followed by 2–3 descending notes, "wiiit wiit wiit"; phrases may be run together into continuous song; may sing for tens of minutes. A series of strident "tschrii tschii" notes at dusk. Call a low "chup" or "chupchup" in alarm; thin "sip" or repeated "psriii" in flight, accompanied by vibrating wings.
Habitat. Forest, preferring dense lowland primary, secondary and lowland shade forest, e.g cocoa plantations with *Erythrina* shade trees, orchards and coffee plantations (commonest in untended mixed cultivations at higher altitudes); also patches of dry woodland in savanna and in cloudforest, to just below summit of island. Sea-level to 2000 m.
Food and Feeding. Beetles, bugs, caterpillars, earthworms and snails; snails include endemic *Columna columna* up to 8 cm long. Also much fruit, including guavas and avocados in orchards, *Spondias cytherae* and *Cecropia* in secondary habitat, and in forest notably figs, including *Ficus sur*, *F. kamerunensis* and *F. fernandesiana*. Forages on ground in leaf litter, and gleans from bunches of coconuts; may be partly crepuscular. Snails often smashed on "anvil" stone; hundreds of shells can accumulate at favoured stones.
Breeding. End Jul to Jan, peak Oct–Dec. Nest a bulky cup of mixed dry vegetable matter and mud, covered externally with dead leaves, moss and interlocked twigs, lined with leaf skeletons and grass stems, usually placed 0·5–4 m off ground in dense vegetation, on horizontal branch, bamboo, forking branch, or banana leaf axil, but can be up to 12 m high. Eggs 2, blue-green with dark reddish and purplish-brown flecks and spots. No information on incubation and nestling periods. Many nests destroyed by brown rats (*Rattus rattus*).
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in São Tomé EBA and Príncipe EBA. Occurs at low density, suggesting that global population small. Nominate race widespread and common in appropriate habitat on São Tomé, but total numbers cannot be great, and removal of shade trees from cocoa plantations a local threat; land privatization and road developments along E & W coasts give some cause for concern over security of primary forest in these areas of the island. Príncipe race *xanthorhynchus* has been considered very rare and possibly extinct, but rediscovered in 1997 and found to be common in small remaining areas of primary forest in C & S; population estimated at fewer than 1000 individuals.
Bibliography. Atkinson, Dutton *et al.* (1994), Atkinson, Peet & Alexander (1991), Bannerman (1953), Borrow & Demey (2001), Christy & Clarke (1998), Christy & Gascoigne (1996), Clement & Hathway (2000), Jones & Tye (1988), de Naurois (1984), Sinclair & Ryan (2003), Snow (1950), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Urban *et al.* (1997).

64. American Robin

Turdus migratorius

French: Merle d'Amérique **German**: Wanderdrossel **Spanish**: Zorzal Robín
Other common names: San Lucas Robin (*confinis*)

Taxonomy. (*Turdus*) *migratorius* Linnaeus, 1766, "in America septentrionali" = North America.
Has in the past been thought to form a superspecies with *T. rufitorques* on account of behavioural and vocal similarities, but plumages rather different. Highly distinctive race *confinis* has been treated as a separate species. Geographical variation in rest of range rather clinal. Proposed race *aleucus* (from Texas) considered indistinguishable from *propinquus*. Seven subspecies recognized.
Subspecies and Distribution.
T. m. migratorius Linnaeus, 1766 – Alaska (except SE) and Canada (except SW & E) S to C & NE USA (SW Kansas, Pennsylvania, New Jersey); non-breeding E USA and E Mexico.
T. m. caurinus (Grinnell, 1909) – SE Alaska and coastal W Canada; non-breeding S to SW USA (to CW California).
T. m. propinquus Ridgway, 1877 – SW Canada (SE British Columbia E to SW Saskatchewan) and W USA (Montana to California) S to C Mexico (S to Jalisco, Oaxaca and Veracruz); non-breeding S to Guatemala.
T. m. nigrideus Aldrich & Nutt, 1939 – E Canada (Labrador, Newfoundland); non-breeding E USA.
T. m. achrusterus (Batchelder, 1900) – SE USA (Oklahoma E to Virginia, S to Texas and Florida); non-breeding S to SE Mexico.
T. m. confinis S. F. Baird, 1864 – W Mexico (Sierra Victoria, in S Baja California).
T. m. phillipsi Bangs, 1915 – highlands of SW Mexico (Jalisco, Guanajuato, S Hidalgo S to S Oaxaca).



Descriptive notes. 23–28 cm; 59–94 g. Male nominate race has blackish head, white broken eyering, white fleck above lores, white throat with black streaks; otherwise, dark grey above, with white-tipped blackish tail; orange-rufous below, vent white; bill yellow; legs brown. Female is similar but usually paler, white areas buffier. Juvenile is brownish with buff spots and streaks above, dull russet with extensive blackish mottling below. Race *nigrideus* is darker above and below than nominate, with greyish vent; *achrusterus* is smaller, browner above, tawnier below, with reduced tail spots; *caurinus* is smaller than nominate, with black-ish of head extending onto mantle, brownish-grey upperparts, reduced tail spots; *propinquus* resembles previous but larger and paler; *phillipsi* is like last, but larger-billed, darker above, browner below; *confinis* is grey-brown from head to rump, short whitish supercilium, sandy-buff below. Voice. Song, mainly before sunrise and in twlight before sunset, mainly by male from high perch, sometimes low or on ground, Mar–Jul (greatest frequency from courtship to hatch, slight resurgence Sept, some winter singing), a variable series of short, sometimes hesitant phrases of fairly loud, low, rich, liquid caroling warbles, each phrase rising and falling in pitch, e.g. "cheerily, cheer up, cheer up, cheerily, cheer up"; song of race *confinis* burrier and less strident. Subsong ("whisper-song") occasionally given, and whispered syllables or phrases can intersperse main song. Calls include spirited "cluk-cluk", varying in pitch and volume with intensity of alarm, often preceded by one or more "sheek" notes; explosive dry "chirr-chirr-chirr-chirr-chirr" or "spikikikikikik", which may rise in intensity and pitch; high, thin whining whistle; high, thin flight note, "ssir" or "srreel".
Habitat. Breeds in mature, logged and early successional forest and woodland, riparian areas, farmsteads, orchards, parks and gardens, where damp bare or grassy substrates exist adjacent to or within patches of trees and shrubs. In SW Washington state, prefers part-logged over intact or clear-cut stands of fir–hemlock (*Pseudotsuga–Tsuga*) forest, in Oregon prefers early and late seral over mid-seral stages in managed fir (*Abies*) forest, and in Idaho commonest in younger growth stages of mixed conifer (*Pinus–Abies*). Winters in similar habitats but generally at lower altitudes, in bottomland woods, forest edges with berry-bearing shrubs and trees, pastures and lawns. In Mexico, breeds in arid to semi-humid pine and pine–oak (*Pinus–Quercus*) woodland and edge, and grassy clearings, at 1500–3500 m, and winters also in oak and semi-deciduous woods, from sea-level to 3000 m.
Food and Feeding. Primarily invertebrates (more than 90% of diet) in spring, equally invertebrates and fruit in summer, and primarily fruit (more than 90%) in autumn and winter; sugar-rich fruit preferred in summer, but lipid-rich fruits equally important in autumn. In one study of contents of 1169 stomachs, more than 50 genera of plants and more than 100 families of invertebrates found as food items, these breaking down into three major food classes: soft-bodied invertebrates, hard-bodied invertebrates, and fruit. Ten commonest recorded invertebrate families across USA are, in descending order of importance, Lepidoptera (unidentified butterflies and moths, presumably caterpillars), Carabidae ground beetles, Curculionidae weevils, Scarabaeidae beetles, Formicidae ants, Elateridae click beetles, Acrididae grasshoppers, unidentified coleopterans,

Arachnida (spiders) and Pentatomidae (stinkbugs); ten commonest fruit genera *Prunus*, *Cornus*, *Rhus*, *Rubus*, *Smilax*, *Vaccinium*, *Ilex*, *Morus*, *Celtis* and *Juniperus*. Presence and proportions of earthworms possibly difficult to assess, owing to problem of detection in samples. Nestling food soft invertebrates such as earthworms and beetle larvae, but up to 30% may be fruit. For period Jun–Aug faecal analysis in New York state disclosed roughly equal mix of animals, notably beetles, and plants, notably chokecherry (*Prunus virginiana*). In W USA, commonly takes hawthorn (*Crataegus monogyna*) and juniper berries. Forages on ground for terrestrial invertebrates (chiefly) and fallen fruit, gleans leaf-dwelling insects and plucks berries in vegetation; occasionally takes flying insects in air. In summer study in Wisconsin, 78% of foraging occurred in vegetation (for insects), 15% on ground and 7% involved berries. When nesting, adults tend to consume smaller prey and feed larger items to young. In non-breeding season, moves in large flocks to lower elevations; attends large roosts from which individuals track sources of fruit, including mistletoes.

Breeding. Early Apr to mid-Aug throughout range (but juveniles as late as mid-Sept in Sonora, in Mexico), very rarely extending into autumn and winter; generally double-brooded or triple-brooded, modelling data from Wisconsin suggest 19% of pairs produce single brood, 62% two and 15% three (4% fail completely). Mainly monogamous within breeding season. Territories can be very small, 0·04–0·24 ha in Wisconsin, 0·12–0·84 in Tennessee, 0·11–0·21 in New York, but residents range more widely; moreover, boundaries may shift within season, as main focus of territorialism around nest (which may be changed for subsequent broods). Nest a deep cup of dead grass, twigs, rootlets, moss and other material, layered internally with mud from worm castings (no mud used in Oaxaca, in Mexico), and lined with fine dead grass; placed at any height in tree but well sheltered and firmly supported, usually low in evergreen early in season, higher in deciduous tree later, sometimes on ground or in stump or on bank or building; in desert-riparian habitat in C Nevada, preferred site single-leaf pinyon (*Pinus monophylla*), with nest orientation mainly between E & S, and large broods positively associated with canopy cover and height. Eggs 2–4 (rarely 5, probably two females then involved), plain sky-blue, rarely spotted; incubation period 12–14 days; nestling period 9–16 days, mostly 13 days; post-fledging dependence 3 weeks. Brood parasitism by Brown-headed Cowbird (*Molothrus ater*) rare and usually unsuccessful. Breeding success highly variable, and predation by snakes, mustelids, rodents and various birds can be high: of 257 nests in NW USA, 138 (54%) failed, 103 (40%) succeeded (fate of the rest unknown), predation accounted for 95 (65%) of failures; 35% of nests with eggs estimated to produce young in Maine, 40% in Delaware and 54% in Illinois; in Delaware, 58% of nests with eggs survived to hatching, 70% of nests with young fledged at least one; proportion of nests with eggs that produced young 26% in Apr, 50% in May and 30% in Jun (relatively poor performance of Apr nests at least partly attributable to often low position in conifer); in Maine, mean number of fledged young per successful nest was 2·5; on Iowa State University campus, nest success was 53·6% for incubation period, 77·5% for nestling period, 41·2% for entire cycle, nests on buildings having much lower success (3·2%) than those in trees and shrubs (44%), and early-season nests in trees and shrubs less successful (37·1%) than late-season ones in trees and shrubs (66·7%), and predation major cause of egg loss but predation and starvation major causes of nestling mortality; in SW Canada, 58·5% of 53 nests produced young, and egg success to fledging was 87%. Survival of fledged young to 1st Nov estimated at 25%; average lifespan beyond mid-winter (i.e. age 6 months) estimated at 1·7 years, with 52% mortality per year in all cohorts after age 6 months (almost complete turnover in population within 6 years). Age of first breeding one year. Oldest recorded individual 13 years 11 months.

Movements. Migrant (primarily diurnal), partial migrant and (mainly in extreme S of breeding range) sedentary. Major seasonal displacements occur across large areas of range in response to changes in availability of soil invertebrates and fruit; hence no recorded winter philopatry. In autumn in E North America, begins flocking in Aug and typically moves S (a few remaining all winter in S Canada and N USA) in Sept–Nov, with peak in second two-thirds Oct in Maryland (but also Arkansas and Florida, suggesting that higher-latitude birds move to middle latitudes as those in latter regions shift to lower latitudes); immigrants reach Mexico mainly Nov (rare passage, Cuba, late Sept to late Nov). W North America populations shift S along or out towards W coast, beginning mid-Aug, with peak numbers in Vancouver Nov–Dec (Vancouver breeders moving to SW USA from Jul–Aug), and migrants from upper regions of California mingling with lowland residents from Oct. In Mexico, sedentary, partial migrant and winter visitor; breeders move to lower elevations in winter (peak descent first half Oct); winter immigrants from N present mid-Oct to Apr, but not in large numbers (rare to uncommon over much of Mexican winter range). Generally rare winter visitor (numbers vary annually) in N Bahamas, Oct–Apr. Over winter months flocks semi-nomadic, shifting with weather patterns and changing resource levels. Return movement N in spring through California and Gulf states begins Feb (rare passage, Cuba, early Mar to mid-Apr), reaching Arkansas and Massachusetts in Mar, Michigan in early Apr, Alaska in Apr–May. Vagrants recorded N & W of breeding range, also S to Belize and E to Greenland and Europe.

Status and Conservation. Not globally threatened. The most abundant and widespread North American thrush and one of the most abundant and widespread of North American birds, thriving in both suburban and natural landscapes. Breeding range expanded with European settlement of North America owing to establishment of farmland and homesteads and, later, suburban gardens and parkland. In 20th century breeding range extended from South Carolina foothills into SE coastal plain, where watering of lawns and pastures resulted in higher densities of topsoil earthworms (although dry, sandy substrates in some areas restrict further expansion); tree-planting and earthworm introduction into prairie soils allowed colonization of Great Plains; and range steadily extended S & W into Texas, Arizona, New Mexico and California by 1950s. Populations in North America now generally stable or increasing, with major increases estimated in USA in N plains, Great Lakes and SE during 1966–1991; slightly negative trend in Canada (but significant increase in Prairie Provinces) and, for years 1980–1996, declines noted in Oregon and California. In Mexico, range spreading in S Coahuila; possibly a recent colonist in N Baja California, where uncommon, but race *confinis* is common within its highly restricted range in S Baja California. Suffered considerably from DDT applications at one site in mid-1950s, and may show depressed reproductive success when breeding in orchards treated with various pesticides; moreover, take-up of DDT from soil to earthworms, and to predators of latter, may continue for 30 years after single application. Up to 10,000 individuals of this species were killed by application of Azodrin on one field in Florida in 1972. Damage caused by this species to commercial orchards can be significant and has been controlled by chemicals and netting. Pairs in fragmented woodlots often select exotic *Lonicera* and *Rhamnus* for nest placement owing to suitability of branch structure for nest construction, but experience high nest predation because of lower height and absence of thorns; restoration of native plant communities may therefore benefit this species and *Hylocichla mustelina*, which also uses (and competes for) exotic plants for nesting.

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PLATE 57

inches 4

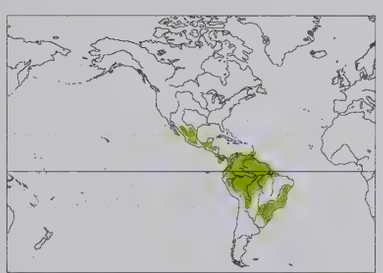
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65. White-throated Thrush

Turdus albicollis

French: Merle à col blanc **German**: Trauerdrossel **Spanish**: Zorzal Cuelliblanco
Other common names: White-necked/White-collared Thrush, White-necked Robin ("nominate group"); Dagua Thrush (*daguae*); Grey-flanked Thrush (*phaeopygos*); Paraguayan Thrush (*paraguayensis*); Rufous-flanked Thrush (nominate); White-necked Thrush (*crotopezus*)

Taxonomy. *Turdus albicollis* Vieillot, 1818, Rio de Janeiro, Brazil.
Races form two groups, the "*assimilis* group" of Middle America and the "nominate group" of South America, commonly treated as two separate species. In addition, race *daguae* recently considered possibly a separate species, and the three races in extreme SE of range (nominate, *paraguayensis*, *crotopezus*) have been proposed as representing a further species on basis of minor differences. In all cases, however, evidence for such splitting has not been coherently marshalled, and in some instances involves largely subjective vocal assessments. Moreover, some races very weakly differentiated and possibly untenable. Proposed race *oblitus* (from Costa Rica) merged with *leucauchen*. Twenty-one subspecies currently recognized.
Subspecies and Distribution.
T. a. calliphthongus R. T. Moore, 1937 – NW Mexico.
T. a. lygrus Oberholser, 1921 – C & S Mexico.
T. a. suttoni A. R. Phillips, 1991 – E Mexico (SW Tamaulipas and NE San Luis Potosí).
T. a. assimilis Cabanis, 1850 – C Mexico.
T. a. rubicundus (Dearborn, 1907) – SE Mexico, W Guatemala and El Salvador.
T. a. leucauchen P. L. Sclater, 1859 – S Mexico S on Atlantic slope to Costa Rica.
T. a. benti A. R. Phillips, 1991 – SW El Salvador.
T. a. hondurensis A. R. Phillips, 1991 – L Yojoa area of C Honduras.
T. a. atrotinctus W. deW. Miller & Griscom, 1925 – E Honduras and N Nicaragua.
T. a. cnephosus (Bangs, 1902) – SW Costa Rica and W Panama.
T. a. campanicola A. R. Phillips, 1991 – Cerro Campana, in C Panama.
T. a. croizati A. R. Phillips, 1991 – Azuero Peninsula, in SC Panama.
T. a. coibensis Eisenmann, 1950 – Coiba I and associated islets (off S Panama).
T. a. daguae Berlepsch, 1897 – E Panama S to NW Ecuador.
T. a. phaeopygoides Seebohm, 1881 – NE Colombia, N Venezuela, Trinidad and Tobago.
T. a. phaeopygus Cabanis, 1849 – E Colombia E to the Guianas and N Brazil.
T. a. spodiolaemus Berlepsch & Stolzmann, 1896 – E Ecuador and W Brazil S to N Bolivia.
T. a. contemptus Hellmayr, 1902 – S Bolivia.
T. a. paraguayensis (Chubb, 1910) – SW Brazil, Paraguay and N Argentina.
T. a. crotopezus M. H. K. Lichtenstein, 1823 – E Brazil.
T. a. albicollis Vieillot, 1818 – SE Brazil and N Uruguay.



Descriptive notes. 20·5–26 cm; 40–77 g. Nominate race has forehead and face blackish-brown, shading to dark brown upperparts; blackish-streaked white throat meeting short white crescent on upper breast, buff-grey mid-breast to upper belly, flanks orangey with brown-buff wash, white belly to vent; narrow yellow eyering; bill yellowish; legs pinkish-brown. Sexes similar. Juvenile is like adult, but with buff flecks on head, vague double orange-spotted wingbars, buffier below with brown barring, bars densest on breast. Races vary mainly in colour tones, and those assigned to "nominate group" (first six in following list) somewhat smaller than those of "*assimilis* group": *phaeopygoides* is darker and more olive above than nominate, breast and flanks buffish-grey, eyering reddish; *phaeopygus* is browner above than previous, eyering yellow; *spodiolaemus* is more rufous-olive above, heavier throat streaks; *crotopezus* is like last, but breast to belly dull grey, flanks tawny; *contemptus* is brighter above than previous; *paraguayensis* is like nominate, but throat streaks heavier, flanks orange-brown; *assimilis* is like nominate but without peach wash below, yellower legs; *leucauchen* is like last but darker and blacker above, more contrasting white fore-collar, slight peachy wash on flanks, brighter orange-yellow bill, eyering and legs; *hondurensis* male has darker crown with big dusky feather centres, female relatively dark above and usually pale below; *calliphthongus* is paler above and below than *assimilis*; *lygrus* is like previous but slightly more rufous above; *suttoni* has darker crown and back than last (always paler and normally duller than *assimilis*); *rubicundus* is dull olive on breast and flanks; *benti* has darker crown and back than last; *atrotinctus* is slaty above; *cnephosus* is similar to *assimilis* but warmer on breast and flanks; *campanicola* is also similar but darker and brighter, crown sootier than back; *croizati* is darker and smaller than previous; *coibensis* is small and dark; *daguae* is smallest of "*assimilis* group", with shorter bill, rusty-brown tinge above, legs brownish-grey. Voice. Song ("nominate group"), regularly delivered in midday hours (from perch in lower or middle storey), a simple, rather monotonous, very leisurely and almost tired-sounding but far-carrying series of short slurred musical paired phrases, e.g. "two-e-o, two-ee" or "churrwerr… eeerrr… weeerr… eerr'e…"; song of "*assimilis* group" (in Costa Rica and Panama) of two types, one very close to that of *T. migratorius*, the other (rarer) much louder, fuller and more melodious and with quality of mockingbird (Mimidae), but phrases again paired. Song of race *daguae* like that of nominate but slightly faster; song of *coibensis* suggests that of *T. grayi*, but is higher and slower. Call of "nominate group" a distinctive "wuk", "ep" or "ok", and alarm a rough "jjig-wig" or "jjig-wig-wig"; in N Middle America a loud nasal gruff "rreeuh", often doubled, a clucking "kyow" or "ch-uhk", a rapid clucking that can become a rich yodel, "wheeljeeujeeujeeu…" (possibly same as nominate alarm call), and thick high "ssi" flight note; in Costa Rica and Panama a frog-like guttural or nasal "enk" or "nrrk", scratchy "dzee-yoo" and, when roosting, a mellow mournful but metallic "peeyuu" or "whuueeet" or "ooeek"; *daguae* commonly utters excited repeated "queeyrp?" and a "krrup".
Habitat. Wooded cover, rarely venturing far into open. In Middle America found in most strata (but not on ground) of forest and edges, including conifers, humid and wet evergreen and arid deciduous (or thorn) forest (last at least seasonally), oak and pine–oak formations, also scrub-choked narrow ravines, deep canyon bottoms where gallery forest shades moist undergrowth, grassy and bushy bracken-covered "savannas", palm and other plantations, stands of tall wild cane, riverside trees and bushy clearings; sea-level to 3000 m, but rarely above 2000 m E of Isthmus of Tehuantepec; 800–1850 m in Costa Rica (but higher in Coto Brus region). In El Salvador found along edges of cloudforest, in cypress (*Cupressus lusitanica*) plantations, in remnant old oak forest with tangled underbrush, old coffee plantations, densely wooded ravines, thus generally in humid woodland with dense understorey. On Coiba I (Panama), in mangroves at sea-level. On Trinidad and Tobago often seen on roads and forest edges. In South America inhabits undergrowth, lower storeys and occasionally middle levels of humid forest (primarily *terra firme*, but also *várzea*), borders, advanced secondary woodland and clearings; mostly below 1500 m, but to only 900 m W of Andes, where *daguae* primarily in foothills; in Venezuela, to 1900 m N of R Orinoco and 1600 m S of it.
Food and Feeding. Insects, earthworms and other invertebrates; also much fruit, including that of *Cordia*, *Myrica*, *Miconia* (including *M. cinerascens*), *Leandra* aff. *sublanata*, *Byrsonima obversa*, *Schinus terebinthifolius*, *Ficus organensis*, *Guarea lessoniana*, *Cereus peruvianus* and a climbing Malpigiaceae. Young at one nest provisioned mainly with earthworms, but also larvae, grasshoppers and fruit. In N Middle America, apparently forages more in trees than on ground; visits fruiting trees, including figs, ripe fruit of *Bumelia*, in hedgerows, savannas and second growth, especially outside breeding season, generally in small flocks; seen to feed in epiphytes in tall mossy oaks, in association with *Ridgwayia pinicola*. In South America forages mainly on ground, occasionally emerging on roadsides or on pastures and lawns, sometimes rising to feed in middle storey at fruiting trees; regularly attends army-ant swarms. Race *daguae* rather more arboreal, but diet apparently typical of species: contents of three stomachs comprised a spider, a locustid, two carabid larvae, one drupe of Oleaceae, five drupes of *Ficus*, wild-fruit skin, two seeds and other plant fragments.
Breeding. Apr–Jul in Mexico; breeding-condition birds Mar–May in Belize; Mar to early Jun in Costa Rica, to Jul in Panama; May–Jun in Colombia; in Trinidad all months except Sept–Oct, with peak Mar–Jun; Dec, Feb and Apr–May in Suriname, and Oct–Dec and Feb–Mar in French Guiana; Nov–Dec in Brazil; probably triple-brooded in Trinidad. Holds small year-round territories in Trinidad. Nest an often bulky, sometimes shallow cup with thick middle layer of mud, dead leaves and twigs, fibrous lining of rootlets and outer covering of green moss, placed 1–9 m up in small tree, on stump, in hollow along branch, against a trunk, on small palm, within epiphyte or on side of earthen road-cut; nests rarely reused, in three cases in Trinidad, intervals before reuse 38, 77 and 87 days. Eggs 2–3, dull whitish, pale blue or pale greenish-blue with reddish-brown and grey spots and marks; incubation period 12·5 days; fledging period in one case 14 days. Of 35 nests in Trinidad, 20% were successful; survivorship of fledglings reared in pastures greater than that in coffee plantations, and most juveniles soon move to forest, where survivorship greater again than for those remaining in plantations.
Movements. Generally sedentary, with some altitudinal movement. In Middle America appears to be distributed throughout elevation range all year, but birds at higher elevations descend lower in winter (Nov–May in part of Sonora, in Mexico, Aug–Dec in Golfo Dulce region of Costa Rica), and possibly make only seasonal use of arid deciduous forest; minor tendency to winter vagrancy, and most individuals at Coban and Vera Paz (Guatemala) disappear in Oct–Dec. In Panama, small numbers apparently disperse to both slopes of Canal area (mostly on Atlantic side) in period Oct–Apr; species almost completely disappears from Cerro Campana in dry season.
Status and Conservation. Not globally threatened. In Middle America fairly common to common. Very common in appropriate habitat in Oaxaca (S Mexico). In interior montane Belize generally abundant. In El Salvador uncommon and sparsely distributed. In Honduras locally common, primarily in forest. In Costa Rica common to abundant on Pacific face of NW divide, but population in upper Valle Central has disappeared. In Panama fairly common to common (locally and seasonally) on Pacific slope, apparently uncommon in E Darién highlands; very common (race *coibensis*) on Coiba I, where one of the most numerous forest birds. In South America fairly common to common E of Andes ("nominate group"). In Venezuela uncommon locally to fairly common, and widespread in lowlands S of R Orinoco, although in some areas sought after as a cagebird (indeed, this true throughout South America). In Suriname and French Guiana very common throughout forested interior, more local at coast. Widespread and common in Trinidad and Tobago. In Ecuador uncommon and local W of Andes, but race *daguae* considered one of commonest birds in lowland foothill forest at Playa de Oro (Esmeraldas). Common in Rio Grande do Sul, in SE Brazil; rare to uncommon in Paraguay, and rare in Uruguay.
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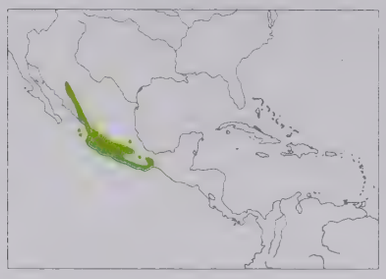
66. Rufous-backed Thrush

Turdus rufopalliatus

French: Merle à dos roux **German**: Rotmanteldrossel **Spanish**: Zorzal Dorsirrufo
Other common names: Rufous-backed Robin; Grayson's Thrush (*graysoni*)

Taxonomy. *Turdus rufo-palliatus* Lafresnaye, 1840, Monterey, California; error = Acapulco, Mexico.
Race *graysoni* has been treated as a separate species, but appears to represent a typical case of colour loss in an insular form of a continental species; in absence of vocal data, separation considered unwarranted. Three subspecies recognized.
Subspecies and Distribution.
T. r. rufopalliatus Lafresnaye, 1840 – W Mexico.
T. r. interior A. R. Phillips, 1991 – SC Mexico.
T. r. graysoni (Ridgway, 1882) – Tres Marías Is (off W Mexico).
Descriptive notes. 21·5–25·5 cm; 72–85 g. Male nominate race has pale grey head, mantle, wings and tail, black lores and yellow eyering, grey-washed dull chestnut scapulars and back; white throat and neck side with dark streaks, orange-chestnut breast and flanks, white belly to vent; bill yellow; legs pinkish. Female is similar but duller. Juvenile is like adult, but with fine buffy stippling and streaking above, dark mottling and barring below. Race *interior* is duller maroon than nominate; *graysoni* is larger, clay-rufous of scapulars replaced by greyish-buff, underparts mainly

On following pages: 67. Creamy-bellied Thrush (*Turdus amaurochalinus*); 68. Black-billed Thrush (*Turdus ignobilis*); 69. Slaty Thrush (*Turdus nigriceps*); 70. Pale-breasted Thrush (*Turdus leucomelas*); 71. White-eyed Thrush (*Turdus jamaicensis*); 72. Plumbeous-backed Thrush (*Turdus reevei*).



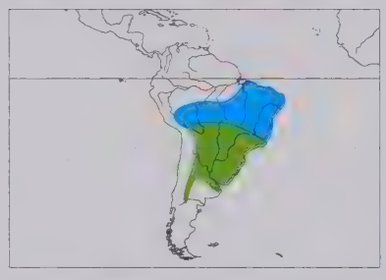
dull buff. Voice. Song a series of leisurely low-pitched rich warbling phrases, e.g. "weedele loo loo freerlii", many repeated 2–3 times. Calls include long mellow mournful descending whistle, "teeeuu" or "cherrp", fairly hard clucking "chuk chuk chuk..." and long descending whistle in alarm, also short, high, thin rising "ssit" in flight.
Habitat. All strata of arid to semi-humid deciduous and semi-deciduous forest, thorn-forest (where most abundant, Colima), inland riparian woodland, and edge, plantations and gardens. Sea-level to 1500 m, and Tres Marías Is to 600 m; apparently feral population in Mexico City at 2200–2500 m.
Food and Feeding. Fruit is staple diet, at least outside breeding season. Commonly forages on ground.
Breeding. Jun–Aug, coinciding with onset of summer rains. Nest in one instance placed in small garden tree 3 m up. Eggs 3, whitish with heavy reddish-brown markings. Brood parasitism by Bronzed Cowbird (*Molothrus aeneus*) recorded.
Movements. Largely sedentary, but part of population on Tres Marías Is (race *graysoni*) visits mainland W Mexico (Nayarit) in Dec–Jun, mainly Dec–Apr. Nominate race occurs fairly regularly N of breeding range in Mexico, and occasionally in S USA, mostly mid-Oct to mid-Apr; vagrants recorded N to EC California. Some extralimital records possibly involve escaped cagebirds.
Status and Conservation. Not globally threatened. Race *graysoni*, sometimes treated as a separate species, is a restricted-range taxon: present in North-west Mexican Pacific Slope EBA. Fairly common to common throughout range; abundant in Colima, and moderately common in Sonora. Populations have relatively recently become established in Mexico City and Oaxaca City as a result of escaped cagebirds. Race *graysoni* is common on Tres Marías Is.
Bibliography. Anon. (1998b), Binford (1989), Brooks (1999), Clement & Hathway (2000), Friedmann *et al.* (1957), Howell & Webb (1995), Nelson (1899), Phillips (1981, 1991), Rowley (1984), Russell & Monson (1998), Schaldach (1963), Sibley (2000).

67. Creamy-bellied Thrush

Turdus amaurochalinus

French: Merle à ventre clair **German**: Rahmbauchdrossel **Spanish**: Zorzal Chalchalero
Other common names: Dusky Thrush(!)

Taxonomy. *T.(urdus) amaurochalinus* Cabanis, 1850, Rio Grande do Sul, Brazil.
Monotypic.
Distribution. S & E Bolivia and S Brazil S to C & E Argentina; non-breeding also N to S Peru and N (non-Amazonian) Brazil, casually to C Chile.



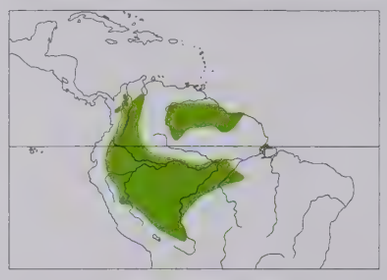
Descriptive notes. 22–25 cm; 52–73 g. Plumage is olive-brown above, including head to below eye, except for black lores; brown-streaked white throat, greyish-buff (sometimes grey) on breast and flanks, shading to creamy-white on lower underparts; bill yellowish when breeding, otherwise duller; legs drab brown. Sexes similar. Juvenile is dark brown with buff spots and streaks above, white on chin and belly, otherwise buff with vague dark brown scaling and mottling below. Voice. Song a musical but fairly monotonous caroling, dry and somewhat less spirited than those of South American congeners, consisting of short simple phrases and notes, pure and trilled, given at regular intervals, e.g. "yo-plantáy, nao-nassáyu, aprorasáyú, friiu friiu" or "tüelek jiejie tuele chip...". Calls include sharp "pok" like cork from bottle, "psiip" in or before flight, and sharp kitten-like "pchuo" in warning.
Habitat. *Cerrado*, open forest, forest borders, lighter woodland, second growth, thorny thickets, open country around houses, woodlots, clearings, riparian scrub, estates, farmland, parks, plazas and rural and urban gardens in semi-humid to semi-arid regions, mainly in lowlands; sea-level to 2600 m in Bolivia.
Food and Feeding. Largely invertebrates, at least in Chaco areas, and regularly sallies for termites. Also many fruits, including *Rapanea laetevirens*, *R. schwackeana* and *Miconia cinerascens*, and one stomach held 14 seeds of *Didymopanax* (Araliaceae), and seen to feed on fallen avocados and tangerines in orchard; 19 species of wild and cultivated fruit reported in one study; one individual seen to eat eucalyptus flowers. Relatively arboreal, but in heavy forest found also on ground around treefalls; also forages on grassy areas adjacent to cover.
Breeding. Fledglings in Feb–Mar in Bolivia; Nov in S Brazil; Oct–Dec, and fledglings in Mar, in Argentina. Nest a cup made of grass, sticks, vines, moss, roots and *Tillandsia*, bound together by cattle dung and mud, lined with rootlets, placed 0·6–1·6 m up in thick bush or hedge. Eggs 3, rarely 4, bluish-green with reddish or dark brown markings; incubation period 15 days; nestling period 14–15 days. Nests parasitized by Shiny Cowbird (*Molothrus bonariensis*).
Movements. Partial migrant. Pattern not clear, but in austral winter some (perhaps majority, with exception of those at N edge of breeding range) move N, in Brazil passing through Rio de Janeiro in waves at end Apr and start May, reaching Maranhão and E Pará mainly Jun-Oct; some return through Rio de Janeiro in Jul. Large numbers Jun–Jul in coastal S Brazil may have been immigrants from farther S.
Status and Conservation. Not globally threatened. Fairly common to common. Common throughout most of Paraguay and all of Uruguay.
Bibliography. de Andrade (1992), Belton (1985), Canevari *et al.* (1991), Clement & Hathway (2000), Fjeldså & Krabbe (1990), Gore & Gepp (1978), Gridi-Papp *et al.* (2004), Guix (2004), Hayes (1995), de la Peña (1987, 1995), Pineschi (1990), Ridgely & Tudor (1989), do Rosário (1996), Schubart *et al.* (1965), Scott & Brooke (1985), Short (1975), Sick (1985, 1993), Wetmore (1926), Whittaker (2004).

68. Black-billed Thrush

Turdus ignobilis

French: Merle à bec noir **German**: Schwarzschnabeldrossel **Spanish**: Zorzal Piquinegro
Other common names: Black-billed Robin

Taxonomy. *Turdus ignobilis* P. L. Sclater, 1858, Nova Grenada [= Bogotá].
Has been treated as conspecific with *T. plebejus*, but probably not closely related. Five subspecies recognized.
Subspecies and Distribution.
T. i. goodfellowi Hartert & Hellmayr, 1901 – Andes of W Colombia.
T. i. ignobilis P. L. Sclater, 1858 – Andes of C & E Colombia.
T. i. debilis Hellmayr, 1902 – E Colombia, W Venezuela, and W Amazonia in Brazil, E Ecuador, E Peru and N Bolivia.
T. i. murinus Salvin, 1885 – S Venezuela and Guyana.
T. i. arthuri (Chubb, 1914) – tepuis of SE Venezuela, Guyana and Suriname.



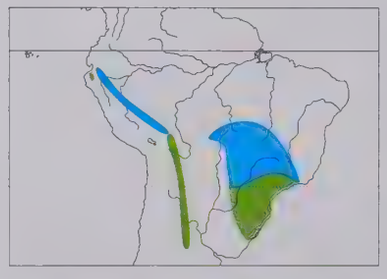
Descriptive notes. 21·5–24 cm; 44–66 g. Nominate race is olive-brown above, paler below, with slightly darker face, brown-streaked off-white throat, whitish mid-belly to vent; black bill and legs. Sexes similar. Juvenile is as adult, but spotted and streaked buff above, with double buff-spotted wingbars, mottled brown below. Race *goodfellowi* is warmer and darker above than nominate; *debilis* is smaller-billed, with more extensive white on throat, greyer on breast and flanks; *murinus* is darker than nominate above, with whiter throat; *arthuri* has darker face, greyer flanks, more contrasting throat pattern. Voice. Song (race *debilis*) a typical *Turdus* series of phrases, but subdued and uninspired, with close resemblance to that of *T. migratorius*, often introduced with "wert" note and commonly inserting "your-your-we" phrases, e.g. "churre, churre, ee, te-o-we, churre...", some birds being highly repetitive, others not; given both in darkness before first light and at midday. In SE Venezuela (*arthuri*), song may rise and fall in more distinct pattern. Calls include "cluck", distinctive upslurred "wi-iit" or "queek!", more even "kwiiit" or "prip"; when disturbed, a loud "quee-kipper-kipper-kipper".
Habitat. Clearings, semi-open areas, savannas with gallery woodland, *cerrado*, lighter secondary woodland, humid forest borders (in extensive forest present only along margins of large rivers), shade coffee plantations, disturbed areas and various early-succession habitats; also brushy pastures, parks, gardens and edges of towns. Generally below 2000 m, and to only 1200 m in Ecuador, but reaching 2800 m in Colombia. In Suriname wholly confined to sandy savannas with scattered bushes and thickets.
Food and Feeding. Beetles and flies, berries, fruits and seeds found in stomachs. Forages mainly in trees, regularly visiting fruiting trees and shrubs, especially melastomes; also often on ground, usually near or in forest.
Breeding. Dec–Aug and Oct in Colombia; Jan and Mar in Suriname. Nest a coarse cup of moss with thick lining of rootlets, usually with mud admixed, placed low in bush, stump or low tree in pasture, or on ground at foot of small bush. Eggs 2, greenish-blue with heavy brown marks; nestling period in one instance 15 days. Immature male probably less than 9 months old had functioning gonads in Mar.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Fairly common to common. Notably numerous in W Colombia and generally widespread in the country, acting as replacement of *T. migratorius* in settled areas. In Venezuela uncommon to locally fairly common, and generally less numerous than in Colombia. Fairly common in Podocarpus National Park, in Ecuador.
Bibliography. Chapman (1917, 1926), Clement & Hathway (2000), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Miller (1963), Phelps & Phelps (1950), Rasmussen *et al.* (1994), Ridgely & Gaulin (1980), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Schubart *et al.* (1965), Sick (1985, 1993), Walker (2001).

69. Slaty Thrush

Turdus nigriceps

French: Merle ardoisé **German**: Weißachseldrossel **Spanish**: Zorzal Plomizo
Other common names: Andean Slaty Thrush (nominate); Eastern Slaty Thrush, Slaty-capped/Behn's Thrush, Blacksmith Thrush (*subalaris*)

Taxonomy. *Turdus nigriceps* Cabanis, 1874, Peru.
Race *subalaris* often treated as a separate species on basis of morphological and vocal differences, although these relatively minor; further analysis of evidence needed. Males of nominate race tend to vary clinally in plumage from N to S. Two subspecies recognized.
Subspecies and Distribution.
T. n. nigriceps Cabanis, 1874 – breeds Andes of SW Ecuador (Loja) and NW Peru (Piura) and from C Bolivia S to C Argentina; non-breeding also S Ecuador S to Bolivia.
T. n. subalaris (Seebohm, 1887) – breeds E Paraguay, SE Brazil and NE Argentina; non-breeding also N to SC Brazil.



Descriptive notes. 19–21·5 cm; 44–55 g. Male nominate race is slate-grey above, shading to slightly paler below, and whitish on belly to vent, with dark-streaked white throat; becomes greyer-crowned, greyer-streaked on throat and paler grey ventrally from N to S; narrow eyering, bill and legs yellow. Female has pattern as male, but greenish-brown above, paler greenish-brown below, throat markings less distinct. Juvenile is like female, but with orange-buff spots and streaks above, buff to orangey with dark scaly pattern below. Race *subalaris* has white throat less streaked centrally and terminating in unstreaked white patch, all-white vent, female more like male than in nominate race. Voice. Song, very ventriloquial, from hidden perch, a series of rather high, jumbled phrases, some notes high-pitched, rapid, shrill and burry but followed by long pause, "tji tjihe tjie tjihe" or "swidrielipik tillie"; that of *subalaris* less jumbled and less musical, a short series of high notes with squeaky bell-like or metallic quality, "tsree tsing, tsing chewluh chewluh chuh, tsree ting, ting sing, sing, sing kli, kli, kli sree" or "tilli tille silltilli ctyio...". Calls include "tick tick tick", "tsok" and melodious "pilic" for contact.

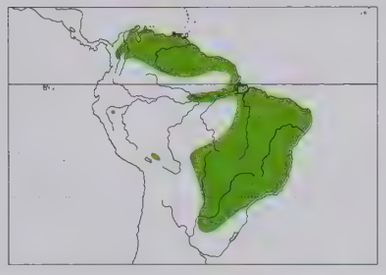
Habitat. Canopy and borders of subtropical humid montane forest, secondary woodland, eucalyptus plantations with native undergrowth, often along streams in dense humid shrubbery and wooded ravines, sometimes alders (*Alnus*); mostly 500–2000 m, in Ecuador 1400–1800 m, but to 2550 m in Bolivia. Race *subalaris* found in canopy and borders of araucaria groves, dense riverine forest, woodland on mountain slopes, gardens with scattered large trees, park-like areas and plantations (occasionally eucalyptus), from sea-level to 1000 m.
Food and Feeding. Invertebrates, but mainly fruit. Invertebrates include snails, beetles, ants and flies; fruits reported include *Psychotria*, *Ajonea saligna*, *Ficus diabolica*, *Diosporos kaki* (introduced persimmon) and, in Brazil, *Rapanea villosissima*. Forages in trees, mainly in shady low to middle levels of forest; also visits ground, and even feeds on lawns and meadows adjacent to cover.
Breeding. Dec–Feb in Bolivia; Nov–Dec (and breeding-condition birds Oct and Jan) in Brazil, and Nov–Dec (fledglings Jan–Feb) in Argentina; male feeding fledgling in Feb in NW Peru. One nest was a cup of moss, sticks and vines, placed in crotch of slender tree in forest; another was of fibres, with moss externally, 1·8 m up in small tree. Eggs 2–4, blue with brown speckling. No other information.
Movements. Recent evidence indicates that nominate race is a partial migrant: largely non-breeding visitor to E Peru, late May to early Sept, but situation complex. View that most records N of Cochabamba (Bolivia) refer to non-breeding migrants no longer tenable, as breeding recorded in NW Peru and now known to breed in Ecuador; in Ecuador, however, breeders apparently present only Jan–May, with records of non-breeders Jun–Jul in SE lowlands. May also be an altitudinal migrant in some places. In Brazil, race *subalaris* a breeding visitor in SE, arriving mainly second half Sept, departing by mid-Apr; non-breeding visitor Apr–Oct in São Paulo, C Mato Grosso, Distrito Federal, Goiás and W Minas Gerais; unclear whether a full or partial migrant.
Status and Conservation. Not globally threatened. Locally common. In SW Ecuador, nominate race considered at some risk from extensive deforestation of recent decades, although still relatively common locally. Race *subalaris* appears to have extended its range S in Brazil; not found in Rio Grande do Sul before 20th century, but now numerous there; no recent records from E Paraguay.
Bibliography. Antas & Valle (1987), Belton (1985), Best *et al.* (1993), Canevari *et al.* (1991), Clement & Hathway (2000), Di Giacomo & López (2000), Ferreira & Bagno (2000), Fjeldså & Krabbe (1990), Hayes (1995), Pineschi (1990), Rasmussen *et al.* (1996), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), do Rosário (1996), Rougés & Blake (2001), Schulenberg (1987), Sick (1985, 1993), Walker (2001).

70. **Pale-breasted Thrush**

Turdus leucomelas

French: Merle leucomèle **German**: Fahlbrustdrossel **Spanish**: Zorzal Sabiá

Taxonomy. *Turdus leucomelas* Vieillot, 1818, Paraguay.
Geographical variation very slight; race *albiventer* possibly not sustainable, as some individuals virtually identical to nominate. Apparently very isolated population in NE Peru not known to be morphologically or otherwise distinct. Three subspecies recognized.
Subspecies and Distribution.
T. l. cautor Wetmore, 1946 – extreme N Colombia (Guajira Peninsula).
T. l. albiventer Spix, 1824 – N & NE Colombia, Venezuela, the Guianas and NE Brazil.
T. l. leucomelas Vieillot, 1818 – NE Peru, S & E Brazil, W & SE Bolivia, Paraguay and NE Argentina.



Descriptive notes. 23–27 cm; 47–78 g. Nominate race is pale olive-brown above, slightly brighter and rustier on wing-coverts and edges of secondaries, darker on primaries and tail, with crown tinted mid-grey, ear-coverts greyish with long thin whitish streaks; whitish throat with diffuse narrow mid-brown streaks, pale greyish-buff breast and flanks, whitish belly to vent, pale orange underwing-coverts; bill greenish-yellow; legs light brown. Sexes similar, female head sometimes browner. Juvenile is as adult, but spotted and streaked buff above, mottled brownish below. Race *albiventer* is smaller and shorter-billed than nominate, more ashy-grey on head, back and rump, less rusty in wing; *cautor* is as previous, but a shade browner (closer to nominate) on back and wings. Voice. Song, from middle or upper strata of trees, sometimes in flight, a series of melodious phrases with individual notes variably repeated, "chirr juep juele chip chirr", recalling *T. migratorius* but more complex, with prominent use of phrases "hereit, hereit" and "tuwee, tuwee"; in response to playback of own voice, one individual gave a song full of elaborate mimicry. Call a distinctive guttural, rattly wooden "quwaak quwaak quwaak" (or "wert-wert-wert" or "reep reep reep"); in alarm a rough "jig-jig" or "zit-zit-zit".
Habitat. Borders of humid forest, open forest, edge and adjacent clearings, drier deciduous woodland, light or disturbed woodland, second growth, savannas with scattered bushes, gallery woodland, palm groves, shade coffee and other plantations, cultivations, parks, shaded shrub-rich gardens and backyards. Mostly below 1500 m; locally to 2000 m, including Perijá Mts (on Colombia–Venezuela border) and in Venezuela.
Food and Feeding. Mainly fruit, with relatively little animal matter; insects (beetles), worms and small lizards recorded. Fruit and seeds include Loranthaceae, *Capsicum*, royal palm (*Roystonea*), small myrtaceous fruits, *Copahyba*, and seeds of *Didymopanax* (Araliaceae) and *Miconia* (Melastomataceae), and various cultivated forms such as bananas, papaya and soursop; in Brazil, *Rapanea acuminata*, *R. gardneriana*, *R. guyanensis*, *R. lineata* and *R. schwackeana*. Commonly terrestrial, foraging on lawns and roadsides, but regularly visits fruiting trees and shrubs, including commercially grown trees; seen to take fallen avocados and tangerines.
Breeding. Jan–Aug in Colombia; Jul–Aug (but sings mainly Dec–Jul, probably breeds most of year) in Venezuela; all year but mainly in Nov–Jul wet season in Suriname; in dry season from Jul in French Guiana; Nov (and breeding-condition bird Jan) in S Brazil; one nest with four chicks in Oct; multiple-brooded, once four broods in period Dec–May). Nest a bulky cup of moss and rootlets, bonded with mud, placed in shrub or tree or on man-made structure such as eaves, rafters, window sill or air-conditioner; nest may be reused for subsequent breeding attempts, can become very large. Eggs 2–4 (mostly 3), bluish-green with reddish-brown spots; incubation period 12–13 days; nestling period 16–17 days. Brood parasitism by Shiny Cowbird (*Molothrus bonariensis*) significant in at least some areas (e.g. near Iguazú Falls, in Argentina); exhibits violent reaction to presence of cowbird near nest.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Fairly common to common. In Colombia, seldom numerous but fairly common in Santa Marta foothills near Minca. In Venezuela common, and one of commonest birds around habitations in N (e.g. Caracas and Maracay). Commonest thrush of coastal region in Suriname, present even in centre of Paramaribo. Common throughout littoral plain, especially in towns and villages, in French Guiana, but virtually absent from interior. Common in parts of Paraguay. Common in NW Rio Grande do Sul, in Brazil. At least in parts of range, benefits from human activity, frequently using buildings for nesting.
Bibliography. de Andrade (1992), Antas & Cavalcanti (1988), Belton (1985), Canevari *et al.* (1991), Clement & Hathway (2000), Fraga (2002), Hardy & Parker (1997), Haverschmidt (1959, 1968), Haverschmidt & Mees (1994), Hayes (1995), Hilty (2003), Hilty & Brown (1986), de la Peña (1987), Phelps & Phelps (1950), Pineschi (1990), Ridgely & Tudor (1989), do Rosário (1996), Schubart *et al.* (1965), Short (1975), Sick (1985, 1993), Thomas (1979), Tostain *et al.* (1992).

71. **White-eyed Thrush**

Turdus jamaicensis

French: Merle aux yeux blancs **German**: Weißaugendrossel **Spanish**: Zorzal Jamaicano

Taxonomy. (*Turdus*) *jamaicensis* J. F. Gmelin, 1789, Jamaica.
Monotypic.
Distribution. Jamaica.



Descriptive notes. 23–24 cm; 59 g. Plumage is slate-grey from mantle to tail, pale grey-brown below; dark chestnut-brown head, white eye; white chin and throat streaked chestnut-brown, joining small white crescent on upper breast, white vent; bill and legs blackish. Sexes similar. Juvenile is like adult, but with heavy breast streaking. Voice. Song a series of repeated, musical phrases, including whistled "hee-haw", resembling that of Northern Mockingbird (*Mimus polyglottos*) but louder and less variable. Calls harsh and shrill.
Habitat. Wet forests and gulleys, also shade coffee plantations and other wooded areas; from 100 m to peaks.
Food and Feeding. Fruits and invertebrates, latter including earthworms and insects. Fruits include *Trophis racemosa* (Moraceae), *Nectandra antillana* (Lauraceae), *Pithecellobium unguis-cati* (Mimosaceae), *Fagara martinicensis* and *F. elephantiasis* (Rutaceae), *Cupania glabra* (Sapindaceae) and *Dunalia arborescens* (Solanaceae); also the introduced *Pittosporum undulatum*, found along mountain trails. Forages secretively in dense vegetation at all levels, from forest floor (searching in leaf litter) to canopy.
Breeding. Apr–Jun. Nest a bulky cup of plant material, placed in tree. Eggs 2–3, pale bluish-green with heavy speckling. No other information.
Movements. Resident; part of higher-breeding population ranges into lowland valleys when not breeding.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA. Fairly common in mountains. Present in Blue Mountain and John Crow National Park.
Bibliography. Anon. (1998b), Bond (1956b, 1979), Clement & Hathway (2000), Downer & Sutton (1990), Lack (1976), Raffaele *et al.* (1998).

72. **Plumbeous-backed Thrush**

Turdus reevei

French: Merle de Reeve **German**: Mausdrossel **Spanish**: Zorzal Dorsiplomizo
Other common names: Reeve's Thrush

Taxonomy. *Turdus reevei* Lawrence, 1869, Puna Island, Gulf of Guayaquil, Ecuador.
Monotypic.
Distribution. W Ecuador and NW Peru.



Descriptive notes. 23–24 cm; 61–66 g. Male is bluish slate-grey above, with white or bluish-white iris, dark-streaked white throat terminating in small white crescent, pale grey breast shading to white on belly and orange-buff wash on flanks, whitish vent; bill and legs pale yellow. Female is slightly browner-headed. Juvenile is like adult, but browner with buff spots and streaks above, dark scalloping below. Voice. Song, apparently only for brief period when breeding, a fairly fast, typical *Turdus* caroling. Call an abrupt piercing "pseeeu", usually downslurred, occasionally even-pitched or upslurred.
Habitat. Deciduous and semi-humid evergreen forest and woodland, edges, scrub, and adjacent clearings; mainly below 1600 m, but recorded to 2500 m in Ecuador; probably rare below 600 m.
Food and Feeding. Diet little known. Mainly arboreal, often gathering in sizeable concentrations in fruiting trees; sometimes joins mixed-species flocks.
Breeding. Nests during rainy season, Jan–Mar/Apr; juveniles in Apr. Only one nest found, an open thick-walled cup of grasses and other plant material, placed c. 2 m up in small tree leaning over ravine. No other information.
Movements. Seasonal movements and marked changes in abundance, but still unclear; appears to follow rains, concentrating in drier areas mainly during rainy season in first half of year. Record of immature on E slope of Andes in Ecuador in Jul 1992 suggests some erratic but seasonal dispersal.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA. Uncommon to locally common (perhaps seasonally). In Ecuador, numerous in Chongon Hills, W of Guayaquil, and even commoner farther S, e.g. in El Oro, but rare to uncommon at some forested sites. Common in Tumbes National Reserve, in Peru.
Bibliography. Best (1992), Bloch *et al.* (1991), Butler (1979), Chapman (1926), Clement & Hathway (2000), Clements & Shany (2001), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Williams & Tobias (1994).

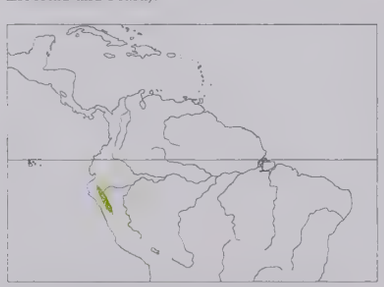


73. Maranon Thrush

Turdus maranonicus

French: Merle du Maranon **German**: Maranondrossel **Spanish**: Zorzal del Marañón

Taxonomy. *Turdus maranonicus* Taczanowski, 1880, Callacate, northern Peru.
Monotypic.
Distribution. Extreme S Ecuador and upper Marañón drainage in NW Peru (Cajamarca, also La Libertad and Piura).



Descriptive notes. 21·5 cm. Plumage is rich brown above with vague darker scales, dull white below, brown scaling on breast and flanks; bill and legs greyish. Sexes similar. Juvenile is as adult, but spotted and streaked orange-buff above, with double orange-spotted wingbars. Voice. Song a pleasant, leisurely, typical *Turdus* caroling, slower and with more slurred notes than that of *T. ignobilis*.
Habitat. Deciduous woodland, secondary growth, clearings, arid scrub and gardens, also borders of relatively humid montane forest and woodland; mostly 200–2000 m, in Ecuador 650–1650 m.
Food and Feeding. Diet not known. Forages on ground, sometimes hopping boldly on ploughed fields and grassy areas. Primarily arboreal during day.
Breeding. No information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Marañón Valley EBA. Apparently fairly common. In Ecuador relatively numerous around Zumba, with smaller numbers N to Valladolid. Present in Podocarpus National Park (Ecuador).

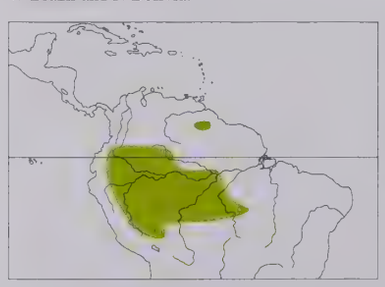
Bibliography. Clement & Hathway (2000), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Williams & Tobias (1994).

74. Lawrence's Thrush

Turdus lawrencii

French: Merle de Lawrence **German**: Lawrencedrossel **Spanish**: Zorzal Imitador

Taxonomy. *Turdus lawrencii* Coues, 1880, "Upper Amazons".
Monotypic.
Distribution. S Venezuela, W Guyana, and upper Amazonia in SE Colombia, E Ecuador, E Peru, W Brazil and N Bolivia.



Descriptive notes. 21·5–23 cm; 73 g. Male is rufous-tinged olive-brown above, rufous-drab below, with dark-streaked white throat, white belly to vent, yellow bill (duller non-breeding) and eyering, flesh-brown legs. Differs from *T. fumigatus* in duller colour above, from *T. hauxwelli* in darker upperparts and weaker throat streaks, from both in having yellow eyering and bill. Female is similar to male, but paler below, duller bill. Juvenile is streaked orange-buff above, with double orangey-tipped wingbars, buffy with heavy brown mottling below. Voice. Song, from hidden perch at middle to high levels, a halting, series of phrases each of which involves near-perfect mimicry of normally short portions of songs and calls of other birds (also of frogs and insects), with a few phrases of its own included, and a singing bout often initiated with a strikingly *Myadestes*-like phrase, e.g. "tu, telii-ti?"; some sing virtually all day, and certainly for long stretches (several hours, with a break of no more than 5–15 minutes; up to 250 phrases delivered in succession), and each has its own repertoire. Variety of species mimicked extraordinary: up to 51 avian species in a single bout, and, among 30 recorded individuals, voices of 173 bird species identified. Own non-mimetic song, occasionally given from usual songpost, comprises strange buzzy languid phrases, repeated many times with little variation. Calls include distinctive "ku, kup, kit?" or "kup-kip?", shrill "peer!", mournful "perwheee", abrupt "weechee" and loud "peep peep peep!".

Habitat. Middle levels and canopy of humid forest, especially *terra firme* (including on sandy soil) but also *várzea*, and also transition forest. Below 600 m, and in Colombia and Ecuador mainly below 400 m, but in Venezuela to 1200 m.
Food and Feeding. Diet not recorded. Forages mainly arboreally, assembling in fruiting trees and shrubs; sometimes descends to ground to feed in damp leaf litter near swamps or forest streams. Occasionally joins mixed-species flocks.
Breeding. Poorly known. Recorded late Jan in Peru, but song period extends through at least Apr–Oct, and speculated that season coincides with wetter months, Nov–Mar. Remarkable vocal copying capacity and lack of response to playback suggest that song used mainly or exclusively in sexual attraction, and that species probably possesses unusual mating system. Nest a cup of grass and mud, wedged between bromeliads and trunk of mid-sized smooth-barked tree, 10–20 m above shallow water in tall flooded forest. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Rare and local in Venezuela. In Colombia known from Tinigua National Park, the species' most N locality. In Ecuador, relatively widespread in forest well E of base of Andes.
Bibliography. Andrade & Rubio (1994), Clement & Hathway (2000), Fitzpatrick & Willard (1982), Hardy & Parker (1997), Hilty & Brown (1986), Hilty (2003), Morales (1979), Parker & Remsen (1987), Phelps & Phelps (1950), Ridgely & Tudor (1989), Ridgely & Greenfield (2001), Sick (1985), Sick (1993), Tobias (2004).

75. Pale-vented Thrush

Turdus obsoletus

French: Merle cul-blanc **German**: Blasssteißdrossel **Spanish**: Zorzal Ventripálido

Taxonomy. *Turdus obsoletus* Lawrence, 1862, Panama Rail Road on Atlantic side of the Isthmus of Panama.
Forms a superspecies with *T. fumigatus* and *T. hauxwelli*, and all three possibly better treated as conspecific. Race *orinocensis* of former sometimes included in present species. Three subspecies recognized.
Subspecies and Distribution.
T. o. obsoletus Lawrence, 1862 – Costa Rica, Panama and NW Colombia.
T. o. parambanus Hartert, 1920 – W Colombia and W Ecuador.
T. o. colombianus Hartert & Hellmayr, 1901 – C Colombia.



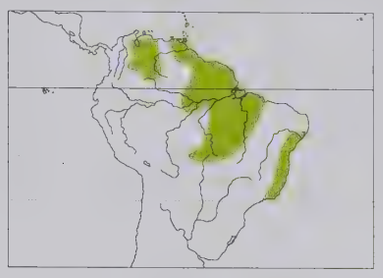
Descriptive notes. 21·5–23 cm; 61–82 g. Nominate race is dark rufous-brown above, paler brown below, with dark-streaked whitish chin, whitish mid-belly to vent, pale orange underwing-coverts; bill and legs brownish grey-black. Sexes similar. Juvenile is like adult, but dark brown with buff spots and streaks above, double orangey-spotted wingbars, orange-buff with dark brown mottling below, with whitish chin and whitish belly to vent. Race *parambanus* is slightly darker brown above, no rich brown tones, belly centrally white; *colombianus* is paler or more fulvous than nominate, breast and flanks tinged olive.
Voice. Song a fairly fast melodious and sustained caroling from hidden perch high in canopy; in Costa Rica and Panama, at least, resembles that of *T. grayi* but is faster, less rich, and interspersed with squeaky notes, churrs and rapid "wiiuwiit". Calls include thin, dry twittering "zhwiik" or "bzeeek", throaty "wuk"; in alarm or when going to roost, querulous whistled "woeep-woeep-woeep-woeep", each note higher.
Habitat. Lower growth, subcanopy and mid-canopy inside humid and wet foothill and lower subtropical forest, preferring areas with clearings, gallery forest and adjacent tall second growth; infrequently seen at forest edge, but occasionally visiting pasture trees and lower second growth, especially outside breeding season. At 750–1200 m, locally reaching 1600 m, in Costa Rica; mostly 500–1500 m in South America, but to 1900 m W of Andes and below 500 m E of Andes in Colombia, and mainly below 1100 m in Ecuador.
Food and Feeding. Fruits of palms and Lauraceae, arillate seeds, berries of many kinds, and invertebrates. Essentially arboreal, foraging in trees; sometimes feeds on ground, searching in leaf litter. Sometimes in small groups, and joins mixed-species flocks. Outside breeding season forms wandering flocks of 10–30 individuals, moving between fruiting trees.
Breeding. Apr–May in Costa Rica and Apr in Colombia. Nest a large bulky bowl of fibres, with mud in foundation, green moss externally, lined with thin dark rootlets, placed 5–18 m up on branch, in or by epiphyte, occasionally in crown of tree-fern, in niche on steep face by road. Eggs 2–3, pale blue-green with reddish-brown spots and blotches. No other information.
Movements. Few detected, but at least part of population probably undertakes seasonal altitudinal movements throughout range. In Costa Rica, post-breeding descent to foothills and adjacent lowlands regularly to 100 m, occasionally to sea-level, and records in Ecuador at 200 m (R Palenque, in Pichincha) also suggest some altitudinal movement.
Status and Conservation. Not globally threatened. Mostly rare to uncommon; common in Costa Rica. Uncommon and seemingly local on both slopes in Panama. Uncommon and perhaps local in Colombia. In Ecuador, rare and local except at El Placer (in Esmeraldas), where comparatively numerous; possibly markedly under-recorded, as its habitat is relatively inaccessible. Present in Darién National Park (Panama).
Bibliography. Anon. (1998b), Carriker (1910), Chapman (1917, 1926), Clement & Hathway (2000), Hilty & Brown (1986), Miller (1963), Phillips (1991), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Slud (1964), Snow (1985c), Stiles & Skutch (1989), Wetmore *et al.* (1984).

76. Cocoa Thrush

Turdus fumigatus

French: Merle cacao **German**: Kakaodrossel **Spanish**: Zorzal Cacao
Other common names: Sabian Thrush; Lesser Antillean Thrush (*bondi*, *personus*)

Taxonomy. *Turdus fumigatus* M. H. K. Lichtenstein, 1823, River Espírito Santo, Brazil.
Forms a superspecies with *T. obsoletus* and *T. hauxwelli*, and all three possibly better treated as conspecific; present species probably closer to latter. Race *orinocensis* sometimes included in *T. obsoletus*. Races *personus* and *bondi* have in the past been considered to represent a separate species. Geographical variation to large extent clinal, and some races possibly not tenable. Five subspecies currently recognized.
Subspecies and Distribution.
T. f. bondi Deignan, 1951 – St Vincent, in S Lesser Antilles.
T. f. personus (Barbour, 1911) – Grenada, in S Lesser Antilles.
T. f. aquilonalis (Cherrie, 1909) – NE Colombia, N & E Venezuela and Trinidad.
T. f. orinocensis J. T. Zimmer & Phelps, Sr, 1955 – W Venezuela and E Colombia.
T. f. fumigatus M. H. K. Lichtenstein, 1823 – the Guianas and N & E Brazil.



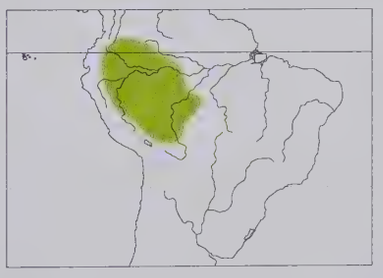
Descriptive notes. 21·5–24 cm; 55–83 g. Nominate race is foxy-brown above, pale orange-brown below, with dark-streaked whitish-buff throat, whitish belly and vent, latter with brown tips; underwing-coverts pale orange; bill and legs brownish-grey. Sexes similar. Juvenile is like juvenile *T. obsoletus*, but buffier on underparts. Race *aquilonalis* is less rufous above and below; *orinocensis* is slightly darker above than nominate, less white below; *personus* is buffish-brown below; *bondi* resembles previous but less rufous above, greyer below. Voice. Song, from middle to upper strata of trees and mostly when breeding (in Venezuela mainly first half of year), a series of short, loud, musical and commonly slurred phrases in which some notes repeated, the performance gliding smoothly along within narrow range of pitches, "pree-er, churry, churry, o-ee-o, lulu, o-e-er, cheer-er, wu-e, wu-e, e-a-oeeo, te-a, te-a, e-o-to-e, cheer-o, o-ee, urr, wu-ee-er, toee-tu-tu, o-ee-o"; also a rapid, slightly descending "wee-a-wee-a-wee-a...". Race *orinocensis* less musical, with choppy delivery, some phrases squeaky. Calls include "bak", warning "chat-shat-shat", harsh "kik-ik-ik-ik" alarm; also descending series of c. 6 melodious "deww-eh" notes, in non-breeding territorial challenge.
Habitat. Lower and middle growth of humid forest and forest borders, adjacent clearings with scattered trees, lighter woodland and gallery forest, with preference for areas near water such as by streams, in swampy areas and in *várzea* forest; also parks, gardens, cultivated areas with plenty of trees, cacao and shade coffee plantations. In Suriname restricted to savanna forests and dark forests of coastal sand ridges. In French Guiana found in old mangroves and swamp-forest in littoral area and, in forested interior, in brushy undergrowth, low marshy areas with lianas, vine forest, riparian forest. In Trinidad largely confined to shady cacao plantations. Mainly 100–1000 m, but locally higher, in Colombia up to 1400 m and in Venezuela (N of R Orinoco) up to 1800 m; to 600 m in Trinidad.
Food and Feeding. Earthworms and millipedes, and berries and other fruit. Forages mainly on ground among leaf litter and in lower levels of forest, but regular at fruiting trees.
Breeding. Mainly Nov–Jun in Lesser Antilles; Aug in Colombia; all months except Sept in Trinidad, with strong activity Feb–Jul and peak May–Jun; Dec and Feb in Suriname; Dec in SE Brazil; up to three or four broods in Trinidad. Nest a bulky cup of plant matter and mud, covered with moss and lined with rootlets, placed up to 5 m above ground on trunk, stump, top of tree-fern or in niche in bank, often along track in forest or cacao plantation; nest reused for subsequent broods if previous one successful. Eggs 2–4 (1–3 in E Caribbean), pale greenish-blue with pale reddish-brown markings; incubation period 12·5–13·5 days; nestling period 13–15 days; post-fledging dependence up to 32 days. Of 57 nests in Trinidad, 33% were successful, those in forest less so than those in cacao plantations.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Uncommon to locally common. In Venezuela, uncommon to locally fairly common N of R Orinoco, and fairly numerous in E Bolívar in tall *várzea* on upper R Cuyuní. Common in Trinidad. Fairly common on St Vincent and Grenada.
Bibliography. Anon. (1998b), Bond (1956b, 1979), Clement & Hathway (2000), Evans (1990), ffrench (1991), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Junge & Mees (1958), Lack (1976), Phelps & Phelps (1950), Raffaele *et al.* (1998), Ridgely & Tudor (1989), Sick (1985, 1993), Snow (1985c), Snow & Snow (1963), Tostain *et al.* (1992).

77. Hauxwell's Thrush

Turdus hauxwelli

French: Merle de Hauxwell **German**: Hauxwelldrossel **Spanish**: Zorzal de Hauxwell

Taxonomy. *Turdus hauxwelli* Lawrence, 1869, Pebas, Peru.
Forms a superspecies with *T. obsoletus* and *T. fumigatus*, and all three possibly better treated as conspecific; present species probably closer to latter. Monotypic.
Distribution. Upper Amazonia in SE Colombia, E Ecuador, E Peru, W Brazil and N Bolivia.



Descriptive notes. 23 cm; 69 g. Rich rufous-brown above, slightly stronger rufous on rump, mid-brown below, with dark-streaked whitish throat, whitish belly and vent, latter with brown tips; underwing-coverts pale orange; bill and legs brownish-grey. Sexes similar. Juvenile is like juvenile *T. fumigatus*. Voice. Song a leisurely, long-lasting series of simple but melodious phrases, with cadence reminiscent of *T. albicollis*; some individuals use mimicry, and in response to playback one gave a subsong ("whisper song") comprising imitations of at least ten bird species found in habitat. Calls include upslurred "drrii" and querulous upslurred "kwiiiiow".
Habitat. Lower strata and subcanopy of humid lowland forest and woodland, including *terra firme* and, especially, *várzea*, river-island forest and other stands near water; to c. 800 m, but in Ecuador mainly below 300 m.

On following page: 78. Clay-coloured Thrush (*Turdus grayi*).

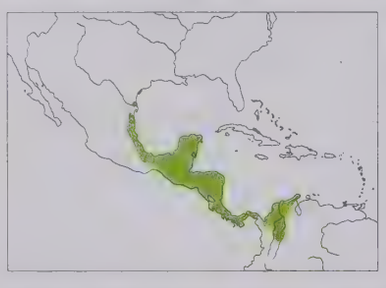
Food and Feeding. Invertebrates and fruits. Comes to fruiting trees. Also forages on ground at edges and in clearings.
Breeding. No information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Uncommon to fairly common, and locally common; scarce in Ecuador. Shy and elusive; easily overlooked. Its habitat at present remains pristine over large areas. Present in Manu National Park and Biosphere Reserve (Peru).
Bibliography. Bond (1956a), Clement & Hathway (2000), Hardy & Parker (1997), O'Neill & Pearson (1974), Phelps & Phelps (1950), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Snow (1985c).

78. Clay-coloured Thrush

Turdus grayi

French: Merle fauve **German**: Gilbdrossel **Spanish**: Zorzal Pardo
Other common names: Clay-coloured Robin, Gray Robin, Garden Thrush, Gray's Thrush

Taxonomy. *Turdus Grayi* Bonaparte, 1838, Alta Vera Paz, Guatemala.
Has in the past been thought to form a superspecies, or even to be conspecific, with *T. nudigenis*, but differences between the two considered too great to warrant such treatment. Geographical variation for the most part very slight; some races perhaps better merged. Proposed race *umbrinus* (from Guatemala) apparently based on fresh nominate specimens. Nine subspecies currently recognized.
Subspecies and Distribution.
T. g. tamaulipensis (Nelson, 1897) – extreme S USA (S Texas) and E Mexico (E Nuevo León, Tamaulipas, N Veracruz).
T. g. microrhynchus Lowery & Newman, 1949 – EC Mexico (SC San Luis Potosí).
T. g. lanyoni Dickerman, 1981 – Caribbean drainage of S Mexico, N Guatemala and S Belize.
T. g. yucatanensis A. R. Phillips, 1991 – N Yucatán Peninsula (SE Mexico and N Belize).
T. g. linnaei A. R. Phillips, 1966 – S Mexico (Pacific Oaxaca and lowland S Chiapas) E to Guatemala border.
T. g. grayi Bonaparte, 1838 – S Mexico (Pacific slope of S Chiapas) E to W Guatemala.
T. g. megas W. deW. Miller & Griscom, 1925 – Pacific slope of W Guatemala S to Honduras and Nicaragua.
T. g. casius (Bonaparte, 1855) – Costa Rica S to NW Colombia.
T. g. incomptus (Bangs, 1898) – Sierra Nevada de Santa Marta, in N Colombia.



Descriptive notes. 23–26·5 cm; 65–86 g. Nominate race is dull mid-brown above; whitish throat with diffuse mid-brown streaks, shading into pale brownish breast and flanks, becoming more ochraceous from mid-belly to vent; underwing-coverts orange-buff; bill olive-yellow; legs pinkish-grey, iris brownish. Sexes similar. Juvenile is vaguely spotted and streaked dull orange-buff above, marbled brownish across cheeks and breast, iris brown. Race *tamaulipensis* is slightly more olive above and more creamy-buff below than nominate, iris brick-red; *microrhynchus* differs from previous mainly in shorter bill and legs; *lanyoni* is slightly browner above and on throat streaks; *yucatanensis* is like nominate above, rich creamy-buff below, particularly on vent; *linnaei* is slightly greyer above, slightly paler below; *megas* is olive-tinged above, dark buffish below, slightly darker and buffier ventrally than previous; *casius* is smaller than nominate, slightly browner above, more uniform brownish-ochre below; *incomptus* is notably smaller and more grey-brown (lacking ochraceous tones) below. VOICE. Song, apparently only by male, just before and during breeding (intensely in pre-nesting stage, weakly by incubation stage), an excellent musical caroling very like that of *T. migratorius* but smoother, clearer, mellower and more melodious, with slurred whistles, warbles, short trills and occasional dry piercing notes (including repeated notes such as a mellow slurred "churry-churro toowiip-toowiip"), often delivered before first light, and at dusk, also through heat of day. Call a rich querulous, nasal upslurred mewing, "hoouree", "reeeur-ee", "jerereee", "teeweeooip" or "wee-ee-gwa", a rattling cackle, throaty "tock", barking nasal "kyuh-kyuh" or "ung-ung", sibilant "sreer" and high thin buzzy flight note, "szzp".

Habitat. Open forest and forest edge, lighter thinned woodland, clearings and semi-open areas, field margins, gardens, suburban lawns, pastures, coconut groves, mango orchards, coffee plantations and cultivated areas of all types, with hedges or scattered trees, around habitations, mainly in more arid areas. Lowlands to c. 300 m in South America; sea-level to 2100 m in N Middle America (to 2450 m in Costa Rica, 1950 m in Panama), where outside breeding season penetrates well into heavier forest, canebrakes and dense second growth.
Food and Feeding. Earthworms, slugs, larval and adult insects, occasionally lizards, also many types of fruit. Many gather at fruiting trees, taking *Ficus*, *Miconia* and other melastomes, *Hamelia patens*, *Cecropia*, *Myrciara floribunda*, *Virola koschnyi*, *Dipterodendron elegans*, *Alchornea latifolia*, *Davilla kunthii*, *Souroubea guianensis*, *Lacistema aggregatum* and *Clusia*. When breeding, adults feed almost exclusively on fruit while raising young on invertebrates (insects, earthworms), which are usually at maximum abundance at time of fledging, although substantial amount of fruit sometimes given to nestlings; in one study in Panama, animal food varied with site, chiefly crabs and homopteran bugs, with 44% fruit at first site, and termites, ants and lizards and only 17·5% fruit at second site, but with broad range of taxa. In Middle America commonly seen on ground, flipping leaf litter with bill, and attending army-ant swarms, occasionally even flycatching during ant or termite mating swarms; also forages in low to middle strata of trees. In South America reported infrequently on ground.
Breeding. Coincident with advent of rainy season, and highly synchronized locally (mean of 25% of females fertile on given day), so that duration of reproductive capacity of population short, c. 3 months in Panama study; breeds Apr–May in Mexico, May–Jul in Belize, Mar–Jul (occasionally Feb and Aug) in Costa Rica and Panama, and Mar–May in Colombia; brood-feeding Aug in Guatemala; up to three broods in a season. Males display-sing in groups. In one study, proportion of females mothering young from extra-pair copulations 53%, and 38% of all nestlings were product of extra-pair copulation. Nest a large broad cup of plant matter, with epiphytes such as *Peperomia* (often) inserted on outer layer, much mud in middle layer, lined with rootlets, grasses and fibres, placed 1–30 m up (generally at 1·5–3·5 m) in well-screened position in tree, amid palm or banana fronds (but often on topmost upturned "fingers" of clump of banana fruit), inside epiphyte or broad leaves of herbaceous plant, on stump or post, sometimes in tree cavity or open shed or on windowsill; in one study, nests placed in isolated trees or bushes, usually in more conspicuous positions (apparently as anti-predator device), on flexible horizontal branches off main trunk. Eggs usually 3, rarely 4, greenish-blue to pale bluish with heavy reddish-brown and lilac-grey markings; incubation period 12–13 days; nestling period 13 days; post-fledging dependence 2 weeks, but in any case interval between loss of eggs or nestlings and start of fresh breeding attempt still 14–18 days in four cases. Of 61 nests in one study, 22 produced at least one fledgling, giving success rate 36% (slightly lower, 34%, for subset of eleven nests monitored from or before first egg) in another study, of 56 nests, 18 (32%) successful, and success higher when laying began before rainy season started than when laying began after rainy season started; in Panama, birds nesting in wet season (when food more abundant) suffered 42% nest predation, whereas those in dry season (food scarce) suffered 15% nest predation; in another Panama study, nest predation 45%. Nest predators include American Swallow-tailed Kite (*Elanoides forficatus*), Fiery-billed Araçari (*Pteroglossus frantzii*), Yellow-throated Toucan (*Ramphastos ambiguus*), White-tipped Brown Jay (*Psilorhinus morio*), tree-squirrels and snakes.
Movements. Presumably sedentary. Some local wandering apparent; in Guatemala, most individuals of nominate race disappear between Sept and Feb.
Status and Conservation. Not globally threatened. Fairly common to common throughout range in Middle America. Very common in disturbed habitats in Belize, and especially numerous in low valleys along coast; one of most widespread bird species in Honduras, but common only in humid patches below 1000 m; generally abundant throughout Costa Rica, particularly in Meseta Central and Guanacaste, but less numerous in dry NW and at upper elevations. Very common on both slopes in Panama, but most numerous in Canal area, profiting from extensive lawns there; density in one small area of gardens 5 pairs/ha, although only 1·6 pairs/ha in another; likely to spread into Darién with Pan-American Highway. Uncommon to fairly common in Colombia, where considerably less numerous than in Panama. Scarce resident in S USA (S Texas). Capable of adapting to anthropogenically altered landscapes, e.g. increasing its numbers at Tikal, in Guatemala, in response to increase in human dwellings and habitat alterations. In Costa Rica, highly esteemed for its song and therefore captured in some numbers.
Bibliography. Anon. (1998b), Binford (1989), Brush (2000), Carriker (1910), Clement & Hathway (2000), Dickerman (1981), Dyrcz (1983), Friedmann *et al.* (1957), Griscom (1932b), Hilty & Brown (1986), Howell & Webb (1995), Lee Jones (2004), Lowery & Dalquest (1951), Monroe (1968), Morton (1971, 1973, 1983), Phillips (1991), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Rowley (1984), Russell (1964), Sibley (2000), Skutch (1960, 1981), Slud (1964), Smithe (1966), Stiles & Skutch (1989), Stutchbury & Morton (1995, 2001), Stutchbury *et al.* (1998), Wetmore *et al.* (1984), Wikelski, Hau *et al.* (2003).

PLATE 59 ➤

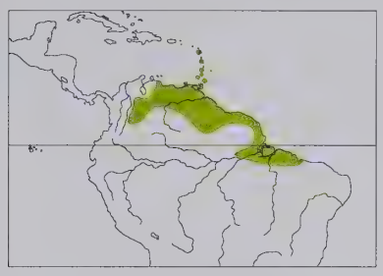

PLATE 59
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80
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ssp *polionota*
ssp *xanthoscela*
ssp *serranus*
86
87
ssp *cumanensis*
ssp *atrosericeus*

79. Spectacled Thrush

Turdus nudigenis

French: Merle à lunettes **German**: Nacktaugendrossel **Spanish**: Zorzal Caripelado
Other common names: Yellow-eyed Thrush, Bare-eyed Thrush, Bare-eyed Robin

Taxonomy. *Turdus nudigenis* Lafresnaye, 1848, Caracas, Venezuela.
May form a superspecies with *T. maculirostris*, and often considered conspecific. Has in the past been thought to form a superspecies, or even to be conspecific, with *T. grayi*, but differences between the two considered too great to warrant such treatment. Two subspecies recognized.
Subspecies and Distribution.
T. n. nudigenis Lafresnaye, 1848 – Lesser Antilles (Guadeloupe, Martinique, St Lucia, St Vincent, Grenada), Trinidad and Tobago, and from Venezuela and E Andes of Colombia E to the Guianas.
T. n. extimus Todd, 1931 – N Brazil.



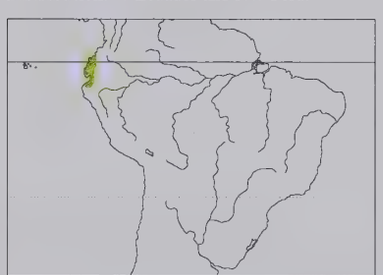
Descriptive notes. 23–24 cm; 50–75 g. Nominate race is olive-brown above, paler below, with dark-streaked white throat, whitish belly and vent, latter with pale brown tips; broad orange-yellow eyering; bill yellow; legs olive-brownish. Sexes similar. Juvenile is like adult above, but with narrow eyering, narrow buff streaks and double orangey-spotted wingbars, orange-buff with dark brown mottling below, whitish chin and whitish belly to vent. Race *extimus* is darker above and below than nominate. Voice. Song a series of short, quiet, monotonous but melodious phrases, more musical than that of many congeners but more halting than *T. fumigatus*, and mixed with many high notes, "clee-er… weer-o…wureer, wureer…". Calls include distinctive querulous, nasal, cat-like "queeow" or (sharply upslurred) "cue-erree" or "miter-ee"; also "tak-tak-tak".
Habitat. Secondary forest, semi-open and dry scrubby areas with scattered groves, clearings, shade coffee and citrus plantations, borders of forest (including gallery forest) and woodland, copses, bamboo clumps, parks, gardens and wooded urban areas; mostly below 1000 m, but to 1600 m in Colombia, 1800 m (mostly below 800 m) in Venezuela.
Food and Feeding. Berries and fruit, including (Trinidad) paw-paw, guava and avocado pear; also invertebrates, including caterpillars, beetles, moths and earthworms. Mainly arboreal, often foraging in flowering and fruiting trees, but readily visits ground and forages on lawns and borders in residential areas, etc.; even takes scraps from birdtables.
Breeding. Mar–Jul in Lesser Antilles; May and Aug in Colombia, May–Sept in Venezuela, Apr–Sept in Trinidad and May–Aug on Tobago; Nov–Aug (perhaps all year) in Suriname and Dec–Apr in French Guiana; May–Jun in Brazil; sometimes double-brooded in Trinidad. Nest a cup of plant material and mud (with or without decoration of moss), lined with rootlets, placed 2–8 m up in fork of large branch or shrub, sometimes on ground; nest occasionally reused for second brood. Eggs 3–4, rarely 2, deep blue to pale greenish-blue with brown, reddish and lilac speckles and blotches. Of 21 nests in Trinidad, 33% were successful.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Common to uncommon generally. Seldom numerous in Colombia; common in Venezuela and in coastal French Guiana. Possibly spreading in N Brazil. Perhaps density highest in Trinidad and Tobago, where occurs also on offshore islets. Fairly common in Lesser Antilles and spreading N there, having colonized Martinique (where relatively rare) in or shortly before 1951, but attempt to introduce this species in Barbados failed; first bred Guadeloupe in 1997.
Bibliography. Anon. (1998b), Bond (1956b, 1979), Cherrie (1916), Clement & Hathway (2000), Diamond (1973), Evans (1990), ffrench (1991), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Junge & Mees (1958), Lack (1976), Levesque (1997), Olivares (1963), Phelps & Phelps (1950), Raffaele *et al.* (1998), Ridgely & Tudor (1989), Sick (1985, 1993), Snethlage (1927–1928), Snow & Snow (1963), Thomas (1979), Tostain *et al.* (1992).

80. Ecuadorian Thrush

Turdus maculirostris

French: Merle d'Équateur **German**: Berlepschdrossel **Spanish**: Zorzal Ecuatoriano

Taxonomy. *Turdus ignobilis maculirostris* Berlepsch and Taczanowski, 1884, Cimbo, western Ecuador.
May form a superspecies with *T. nudigenis*, and often considered conspecific. Monotypic.
Distribution. W Ecuador and NW Peru.



Descriptive notes. 21·5–23 cm; 62–76 g. Olive-brown above, paler and warmer brown below, with dark-streaked white throat, whitish centre of belly and vent; faint yellow eyering; bill dusky yellow; legs olive-brownish. Differs from very similar *T. nudigenis* in having narrower yellow eyering, paler upperparts. Sexes similar. Juvenile is like juvenile *T. nudigenis*. Voice. Song a musical caroling; main call a whining cat-like upslurred "queeoww", similar to that of *T. nudigenis*, also "chuk".
Habitat. Humid lowland and subtropical forest, deciduous forest, forest borders, secondary woodland, lightly wooded habitats and clearings with scattered trees; from sea-level to 1900 m, but in Ecuador reaching 2200 m near Ibarra.
Food and Feeding. Little information. Forages mostly in trees.
Breeding. Nests found in mid-Feb: one a cup of small fine twigs and a few leaves, placed c. 60 cm off ground in low vegetation beside a trail, a second 1·5 m up in cut tree stump amid thickly regenerating shoots. Eggs 3. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tumbesian Region EBA. Uncommon to fairly common. The most numerous and widespread *Turdus* within its range in Ecuador, where, since 1980, has begun to spread into C valley. Fairly common at Campo Verde and El Caucho, in NW Peru.
Bibliography. Best (1992), Chapman (1926), Clement & Hathway (2000), Parker *et al.* (1995), Pople *et al.* (1997), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Wiedenfeld *et al.* (1985).

81. Unicoloured Thrush

Turdus haplochrous

French: Merle de Bolivie **German**: Palmaritodrossel **Spanish**: Zorzal Boliviano

Taxonomy. *Turdus haplochrous* Todd, 1931, Palmarito, San Julián River, Chiquitos, Bolivia.
Monotypic.
Distribution. N Bolivia (SE Beni, W Santa Cruz).



Descriptive notes. 23–24 cm; 84 g. Plumage is olive-brown above, slightly paler below, with dark-streaked whitish throat; bill pale brownish-yellow; legs brown. Sexes similar. Juvenile undescribed. Voice. Little information. Song a series of whistled phrases, similar to that of *T. hauxwelli*; rattles and squawking calls.
Habitat. Semi-deciduous woodland, semi-open forest and seasonally flooded riverine forest (*várzea*), at 250–350 m. Seen to perch in uppermost branches of youngest trees in riverine forest, but trapped in dense undergrowth 3–4 m tall.
Food and Feeding. No information.
Breeding. No information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Poorly known; apparently rare. Range appears to be very small and distribution patchy, although habitat extensive and under little threat. Present in Beni Biosphere Reserve and Isiboro Sécure National Park.
Bibliography. Clement & Hathway (2000), Collar *et al.* (1992), Ergueta & de Morales (1996), Ridgely & Tudor (1989), Stattersfield & Capper (2000), White *et al.* (1995).

82. American Mountain Thrush

Turdus plebejus

French: Merle de montagne **German**: Cabanisdrossel **Spanish**: Zorzal Plebeyo
Other common names: Mountain Robin, Mountain Thrush

Taxonomy. *Turdus plebejus* Cabanis, 1861, Costa Rica.
Has been treated as conspecific with *T. ignobilis*. Geographical variation minimal and probably clinal; possibly better treated as monotypic. Three subspecies tentatively recognized.
Subspecies and Distribution.
T. p. differens (Nelson, 1901) – SE Mexico and Guatemala.
T. p. rafaelensis W. deW. Miller & Griscom, 1925 – Honduras, Nicaragua, El Salvador and NW Costa Rica.
T. p. plebejus Cabanis, 1861 – Costa Rica and W Panama.



Descriptive notes. 23–25·5 cm; 86 g. Nominate race is dull darkish olive-brown above, paler drab-brown below, with slightly darker face, slightly paler throat with vague brown streaks; bill and legs blackish. Sexes similar. Juvenile is spotted and streaked buff above, mottled dark brown below. Race *differens* has stronger olive wash above and below, throat streaks obsolete; *rafaelensis* is intermediate between previous and nominate. Voice. Song (relatively infrequently given) a rapid, sustained, monotonous, mechanical and unmusical warbling, "cher-chip-chip-cher-chip-chi-chu-chee-tsup-chip…", sounding as if from a smaller bird. Calls include clucking disturbed-sounding cackling, "kwek-kwek-kwek" or "whip-whip-whip", deeper "tock-tock-tock" in alarm at nest, low questioning "toc", mournful "ooooreee", and high thin flight note, "siip" or "peeent".
Habitat. Humid evergreen forest and edge, open oak woodland, second growth, tall epiphyte-burdened mountain forests and adjacent tree-dotted clearings, forest patches, park-like pastures with scattered moss-clad trees. At 1800–3500 m, locally lower; from 1300 m to tree-line in Honduras and Costa Rica; in Panama, from 1200 m in W Chiriquí and from 900 m in E Chiriquí and Bocas del Toro. In Costa Rica, replaces *T. grayi* at higher elevations, but itself replaced by *T. nigrescens* above 2400 m.
Food and Feeding. Arillate seeds and many kinds of berries, including small red berries of "pisco" (Myrtaceae) and seeds of "largartillo" (*Xanthoxylum*); also invertebrates. Forages usually well up in trees for fruit, but also along large branches and on ground for insects, fallen fruit, etc.; in cloudy or rainy weather feeds on mountain pastures. Usually in small groups when feeding. Outside breeding season, flocks visit small individual fruiting trees and low second growth. Seen to fly far down and up valley on daily sorties, evidently to some fruiting source well out of territory.
Breeding. Mar–Jun in Costa Rica. Nest a large cup of green moss with middle layer of dry bamboo leaves, thin lining of black rootlets, hidden amid epiphytes 3–12 m up in isolated tree near forest or in forest canopy. Eggs 2–3, blue-green; incubation period unrecorded; nestling period apparently c. 20 days.

On following pages: 83. Sooty Thrush (*Turdus nigrescens*); 84. Yellow-legged Thrush (*Turdus flavipes*); 85. Pale-eyed Thrush (*Turdus leucops*); 86. Glossy-black Thrush (*Turdus serranus*); 87. Black Thrush (*Turdus infuscatus*).

Movements. Apparently sedentary or minor altitudinal migrant; in Costa Rica at height of rains, makes post-breeding descent to 900 m, usually in small flocks, returning Jan–Feb.
Status and Conservation. Not globally threatened. Fairly common to common in N of range, but very uncommon in Oaxaca (Mexico). Abundant in C highlands of Costa Rica. Fairly common to common in Panama.
Bibliography. Anon. (1998b), Binford (1989), Carriker (1910), Clement & Hathway (2000), Friedmann *et al.* (1957), Green (1983), Howell & Webb (1995), Land (1970), Monroe (1968), Phillips (1991), Ridgely & Tudor (1989), Skutch (1967), Slud (1964), Stiles & Skutch (1989), Wetmore (1944), Wetmore *et al.* (1984).

83. Sooty Thrush

Turdus nigrescens

French: Merle fuligineux **German**: Rußdrossel **Spanish**: Mirlo Negruzco
Other common names: Sooty Robin

Taxonomy. *Turdus nigrescens* Cabanis, 1861, Volcán de Irazú, Costa Rica.
Considered biologically very similar to *T. migratorius*. Monotypic.
Distribution. Costa Rica and W Panama.



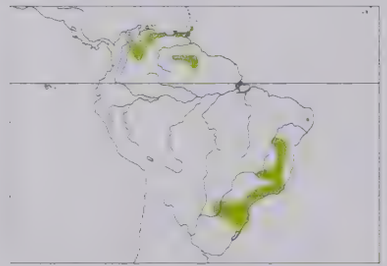
Descriptive notes. 24–25·5 cm; 96 g. Male is brownish-black, with sooty-black lores, orbital area, wings and tail; yellow-orange bill, orange eyering and legs, white iris. Female is similar to male but browner, sometimes with darker streaking on throat. Juvenile is dark brown with buff streaks above, buff with dark brown spotting below, has white chin, pale eye and brownish-yellow bare parts. VOICE. Song relatively poor, a series of short phrases each repeated 3–6 times with a few seconds' pause, and consisting of gurgling, buzzy or squeaky *Vireo*-like notes, "chuweek chuweek chuweek... seechrrrzit seechrrrzit seechrrrzit... tseeur tseeu tseeur tseeur". Calls include distinctive low grating "grrrek" or "trrrr", often repeated, thin rolling "prrreee", and harsh "tchweerp, tchweerp".
Habitat. Open areas at high elevations, including *páramo*, bushy scrub around volcanic cones, open bogs, pastures, low second growth, edges and openings of oak forest; from 2500 m upwards, in Panama from 2250 m.
Food and Feeding. Insects and spiders, many kinds of berry, especially Ericaceae, *Solanum*, and melastomes, blackberries and arillate seeds. Forages mainly on open ground, poking into grass tussocks and low herb cushions, flipping over leaves with bill. Usually in small loose groups at good foraging sites.
Breeding. Mar–May in Costa Rica. Nest a bulky cup of twigs, rootlets, lichen and moss, with tightly woven lining of soft fine grasses, sometimes reinforced with mud, placed 2–8 m up in tall shrub or tree; unusually for the family, in present species male recorded (photographed) collecting material for nest-building. Eggs 2, plain greenish-blue. No other information.
Movements. In Costa Rica, some occasionally descend to 2150 m, mainly after breeding season; in Panama, likewise reported from as low as 1830 m on Llanos del Volcán.
Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. Common to abundant in Costa Rica in Cordillera Central and Talamanca Cordillera. Uncommon to fairly common in Panama (W Chiriquí), with greater numbers at higher elevations.
Bibliography. Anon. (1998b), Carriker (1910), Clement & Hathway (2000), Phillips (1991), Ridgely & Gwynne (1989), Slud (1964), Stiles & Skutch (1989), Wetmore *et al.* (1984).

84. Yellow-legged Thrush

Turdus flavipes

French: Merle à pattes jaunes **German**: Köhlerdrossel **Spanish**: Mirlo Azulado

Taxonomy. *Turdus flavipes* Vieillot, 1818, Rio de Janeiro, Brazil.
Normally placed in genus *Platycichla*, but basis for generic separation not supported by molecular studies. Five subspecies recognized.
Subspecies and Distribution.
T. f. venezuelensis (Sharpe, 1902) – N & E Colombia and N & W Venezuela.
T. f. melanopleura (Sharpe, 1902) – NE Venezuela and Trinidad.
T. f. xanthoscela Jardine, 1847 – Tobago.
T. f. polionota (Sharpe, 1902) – S Venezuela, Guyana and NE Brazil.
T. f. flavipes Vieillot, 1818 – SE Brazil, SE Paraguay and NE Argentina.



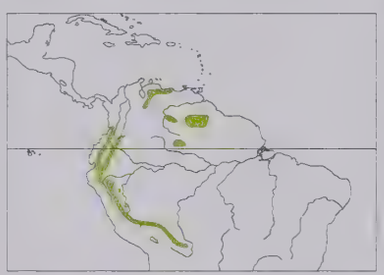
Descriptive notes. 22 cm; 55–72 g. Male nominate race has black hood to breast (variably lower), black wings and tail, dull slate-grey on rest of plumage; yellow bill, eyering and legs. Female is warm darkish brown above, paler and slightly orangey below, with dull bill, yellowish eyering and yellow legs. Juvenile male is slate-brown, with black wings and tail, juvenile female like adult female, both with buffy-orange spotting from crown to back, spotting and barring below. Race *venezuelensis* male is duller, paler grey on mantle and belly, whitish chin, female more olive above; *polionota* resembles previous, but female greyer from crown to tail; *melanopleura* male is variable, mostly blacker (more extensive over belly), female duller below; *xanthoscela* male is entirely black when fresh, female as nominate. VOICE. Song, from treetop, highly variable within and among individuals, sometimes very musical and pleasant, sometimes quite squeaky, consists of a loud, rambling series of variable but severally repeated phrases, e.g. "sweet to-weeea-speet"; mimicry of other birds frequent, albeit often of poor quality in SE Brazil and Trinidad; may continue for hour or more with only short breaks. Calls include "tsrip", typical turdine cluck, also strange "seeeet" in alarm.
Habitat. Most strata (including lower middle levels and canopy) and borders of humid forest and secondary woodland, and in adjacent clearings and shade coffee plantations. Lowlands to c. 2000 m, mainly 500–1500 m; in Venezuela, 480–2500 m N of R Orinoco and 1000–1800 m S of river, but only 100–900 m on Margarita I.
Food and Feeding. Mainly fruit, e.g. on Trinidad those of *Myrcia*, *Sloanea* and matchwood (*Didymopanax*); also insects. In Brazil, fruit of *Rapanea acuminata*, *R. ferruginea*, *R. gardneriana* and *R. lineata* recorded as food. Sometimes gathers in fruiting trees and shrubs; only infrequently forages on ground.
Breeding. Jun, and juveniles in Sept and Dec, in Colombia; Mar–Jul in Trinidad; Nov–Jan in S Brazil; song mainly during first half of year in Venezuela. Nest is a shallow cup made of roots mixed with mud, coated with moss, lined with fine roots, and placed in niche in bank or rock face in ravine. Eggs 2, pale blue to greenish-blue with reddish-brown markings. No further information available.
Movements. Apparently sedentary in Andean part of range, but speculated to be partial migrant at least in Colombia (reasons for this unstated); in Venezuela, fewer records late Jul to Nov, and a migratory flock of 24 seen moving N through Portachuelo Pass in mid-Aug, suggesting some kind of general movement. Atlantic Forest populations move N in austral autumn; waves of birds passing through Rio de Janeiro (Brazil) from end Apr to start May, returning Jul (dates and numbers varying with weather). Spring transient in Paraguay; summer breeder in SE Brazil (Rio Grande do Sul) and possibly also NE Argentina.
Status and Conservation. Not globally threatened. Fairly common. Fairly common in Venezuela, Trinidad and Tobago, although endemic race *xanthoscela* in Tobago inevitably has extremely restricted range. In Brazil, common in Rio de Janeiro and Espírito Santo, but uncommon in Rio Grande do Sul.
Bibliography. Belton (1985), Canevari *et al.* (1991), Clement & Hathway (2000), ffrench (1991), Fjeldså & Krabbe (1990), Gonzaga *et al.* (1995), Guix (2004), Hayes (1995), Hilty (2003), Hilty & Brown (1986), Junge & Mees (1958), Navas & Bó (1993), Phelps & Phelps (1950), Pineschi (1990), Ridgely & Tudor (1989), do Rosário (1996), Scott & Brooke (1985), Sick (1985, 1993).

85. Pale-eyed Thrush

Turdus leucops

French: Merle à oeil clair **German**: Taczanowskidrossel **Spanish**: Mirlo Ojiblanco

Taxonomy. *Turdus leucops* Taczanowski, 1877, Ropaybamba, Peru.
Normally placed in genus *Platycichla*, but basis for generic separation not supported by molecular studies. Monotypic.
Distribution. N, W & SE Venezuela, W Guyana and N Brazil (N Roraima, N Amazonas), W & E Andes of S Colombia and Ecuador, and from Peru S to Bolivia (La Paz, Cochabamba, C Santa Cruz).



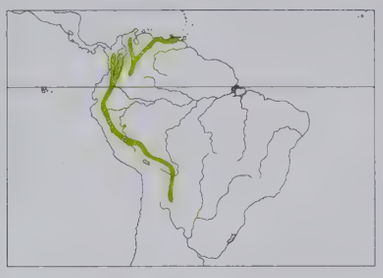
Descriptive notes. 18–21 cm; 66 g. Male is all black, with bluish-white iris, yellow bill and legs. Female is warm darkish grey-brown above, slightly paler below, with pale grey-brown eye, yellowish bill (darker when not breeding), dull yellow legs. Juvenile is like female, but flecked and streaked buff-orange above, mottled brownish-black from breast to flanks, palish eye, dark bill, dull yellowish legs. VOICE. Song (from canopy or subcanopy) a disjointed, choppy but fine series of short phrases, some musical, many high and thin, usually with long pauses, "wheero-weet, chup-e, ez-t, e-ta, ti't, eez, cheur-ez-weet, éèskee, weewee...", unusually variable and complex, and often mimicking other bird species; one phrase recalls song of *Catharus ustulatus*.
Habitat. Most strata (lower and middle storeys, less often subcanopy and canopy) and borders of humid and wet montane forest, especially mossy forest and old second-growth woodland; mostly at 900–2000 m, occasionally wandering to adjacent lowlands, and reportedly up to 3100 m.
Food and Feeding. Mainly fruit and berries. Forages arboreally in furtive manner, but sometimes gathers in small flocks in fruiting trees; also feeds on ground amid leaf litter inside forest, and seen to follow army ants.
Breeding. Food-carrying adults and recently fledged young in Jun in Colombia; song mainly May-Jun in Venezuela. Nest of moss with some vegetable fibres, placed up to 3 m above ground in tree. No other information.
Movements. Apparently sedentary in most of range; records below and above main elevational range may refer to seasonal vertical movements, and possibly nomadism. Some seasonal movements possible in Venezuela, where all specimen records are dated late Nov to late Jun.
Status and Conservation. Not globally threatened. Not well known; seemingly uncommon and local, but notably shy and reclusive, so that true assessment of status proves difficult; species may be more numerous than normal encounter rates tend to indicate. In W Colombia (Chocó), uncommon and local; rare to uncommon in Venezuela. Fairly common in Podocarpus National Park, in Ecuador.
Bibliography. Chapman (1917, 1926), Clement & Hathway (2000), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Parker *et al.* (1985), Phelps & Phelps (1950), Rasmussen *et al.* (1994), Renjifo (1999), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Salaman (1994), Walker (2001), Willis (1988).

86. Glossy-black Thrush

Turdus serranus

French: Merle lustré **German**: Samtdrossel **Spanish**: Mirlo Serrano
Other common names: Black Ouzel

Taxonomy. *Turdus serranus* Tschudi, 1844, Peru.
Formerly included *T. infuscatus* as a race, but that species rather smaller and with different song and female has distinctive underwing-coverts. Birds from Argentina (Jujuy) described as race *unicolor*, but that name invalid, as preoccupied, and no replacement proposed; included in race *serranus*. Four subspecies recognized.
Subspecies and Distribution.
T. s. atrosericeus (Lafresnaye, 1848) – NE Colombia and N Venezuela.
T. s. cumanensis (Hellmayr, 1919) – NE Venezuela.
T. s. fuscobrunneus (Chapman, 1912) – C & S Colombia and Ecuador.
T. s. serranus Tschudi, 1844 – Peru, W Bolivia and NW Argentina.



Descriptive notes. 23–25 cm; 70–90 g. Male nominate race is all glossy black, with yellow bill, eyering and legs. Female is dark olive-brown above, slightly paler and redder below, with brownish bill, yellow eyering and legs. Juvenile male is deep sooty-brown above, female warm brown, both with buff spots and streaks above, mottled buff and dark below. Race *cumanensis* male is dark chocolate-brown with rufous-brown wing edgings, while female is mid-brown above, deep sooty-grey below; *atrosericeus* female is pale olive-brown above, greyish-brown below; *fuscobrunneus* female is darker above. Voice. Song, often from exposed perch in canopy (sometimes from within epiphyte), usually given for c. 30 minutes before sunrise, uninspiring, tirelessly repeated with short intervals, a series of a standard, very rapid phrase, "tii-do-do-iit" or "tii-do-didi-do-diit" or "sriigli sirrieglegi", shrill, wiry and usually slightly rising. Calls include "tjick tjick tji-tji-tji" in flight, rasping "rrrrrt-rrrrrt" in agitation at dusk, and "kip-kip" or "cop-cop-kip-kip" in alarm.

Habitat. Middle and upper strata of primary humid and wet subtropical and temperate montane forest, tall cloudforest, forest borders, advanced secondary woodland and remnant woodlots (also dry forest in NW Peru); never venturing far from forest edge, but enters gardens and clearings in Venezuela. Mainly 1400–2800 m, occasionally higher (to 3350 m, once 3750 m) in Ecuador; also lower on Pacific slope in Colombia and Ecuador, also in Venezuela (range 900–2900 m) and Argentina.

Food and Feeding. Fruits and berries. Forages arboreally, seldom visiting ground, but sometimes hopping into open along roads in twilight. Regularly gathers at fruiting trees. Rarely in mixed-species flocks.

Breeding. Mar–Aug in Colombia (song period Feb–Jul in W Andes), but fledglings seen also in Oct and Nov; fledglings in Feb and Jun in Ecuador, Jul–Aug in Peru and Sept in Bolivia. No data on territory size, but songposts in forest c. 300 m apart. Nest in one case a mossy, mudless cup placed low in vine tangle on mossy tree trunk. Eggs 2, pale blue with light brown and purple spots. No other information.

Movements. Presumably mainly sedentary. Some seasonal altitudinal and other movements indicated by records in Colombia at 1000 m (Sept–Oct in Anchicayá Valley), and in Ecuador at 3100–3350 m on E slope of Andes; in Venezuela, flock of 10–12 in open area of forest on Cerro Negro, late Aug.

Status and Conservation. Not globally threatened. Fairly common. Locally common in Venezuela. Fairly common in Podocarpus National Park, in Ecuador. Present in several other protected areas, including Macarao National Park (Venezuela), Munchique National Park (Colombia) and Calilegua National Park (Argentina).

Bibliography. Best *et al.* (1993), Canevari *et al.* (1991), Chapman (1917, 1926), Clement & Hathway (2000), Escalona & Peterson (1997), Fjeldså & Krabbe (1990), Fjeldså & Maijer (1996), Hilty (2003), Hilty & Brown (1986), Krabbe *et al.* (1997), Miller (1963), Phelps & Phelps (1950), Rasmussen *et al.* (1994), Renjifo (1999), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Walker (2001), Willis (1988).

87. Black Thrush

Turdus infuscatus

French: Merle enfumé **German**: Guatemaladrossel **Spanish**: Mirlo Guatemalteco
Other common names: Black Robin

Taxonomy. *Mer.(ula) infuscata* Lafresnaye, 1844, Mexico.

Formerly treated as race of *T. serranus*, but rather smaller, with different song, and female has distinctive underwing-coverts. Monotypic.

Distribution. E & S Mexico S to Honduras and N El Salvador.



Descriptive notes. 21·5–24 cm; 71–81 g. Male is all black, with bright yellow bill, eyering and legs, dark iris. Female is dark brown, paler below, with buff preocular line above dark loral line, buff throat lightly streaked dark, pale orange underwing-coverts, darkish bill, yellowish eyering and legs. Juvenile is dark brown above, with orange-buff spots and streaks on shoulder, orange-buff with very vague dark brown spots below, spots densest on breast; first-year male (can breed) blackish with grey-brown feather tips, dark-streaked buff-white throat. Voice. Song a series of rich warbling phrases, each repeated 2–3 times, smooth and mellow but with hesitant quality and, depending on singer, interspersed with trivial and harsh sounds and mimicry of other birds; some sing very beautiful songs, others deliver chattery garbled mediocre performances. Calls include dry clucking "chuh-chuh-chuh-chuh-chuh", harder "chehk-chehk", and high thin "sii" flight note; alarm calls at nest same as those of *T. migratorius*.

Habitat. Mainly middle and upper strata of humid evergreen to pine–evergreen forest, cloudforest and edge, at 1200–3500 m; above 1800 m in Honduras.

Food and Feeding. Insects and fruits, especially small berries. Occasionally forages on ground in clearings, but mainly arboreal feeder; gathers in loose flocks in fruiting trees.

Breeding. May–Jul in Mexico. Nest a cup made of green mosses, lined with rootlets and rhizomes; three in Mexico were placed c. 4 m, 15 m and more than 20 m above ground on mossy limb of oak. Eggs 1–2, plain blue. No other information.

Movements. Minor movements downslope in winter; in Sierra de Tecpam, in Guatemala, apparently present only Feb–Jun for breeding, presumably moving to lower, warmer regions for rest of year.

Status and Conservation. Not globally threatened. Fairly common to common. Fairly common in all parts of Oaxaca, in S Mexico. In Honduras uncommon except in department of Ocotepeque, where common.

Bibliography. Anon. (1998b), Binford (1989), Clement & Hathway (2000), Escalona & Peterson (1997), Friedmann *et al.* (1957), Greenberg *et al.* (1997), Howell & Webb (1995), Land (1970), Monroe (1968), Phillips (1991), Rowley (1984), Skutch (1967), Wilson & Ceballos-Lascurain (1986), Winker *et al.* (1999).


ssp fuscater
ssp ockendeni
88
ssp anthracinus
♂
89
♀
ssp cacozelus
♀
90
♂
ssp chiguanco
♂
PLATE 60
inches 4
cm 10
ssp dodae
91
ssp swalesi
92
ssp plumbeus
ssp ardosiaceus
ssp albiventris
ssp rubripes
93
♀
ssp olivater
♂
ssp kemptoni
♀
94
♂
95
♂
ssp ptaritepui
♂
ssp falcklandii
97
96
♀
ssp magellanicus
♂
98
ssp simensis
ssp litsitsirupa

88. Great Thrush

Turdus fuscater

French: Merle géant **German**: Riesendrossel **Spanish**: Mirlo Grande
Other common names: Giant Thrush (*gigas*)

Taxonomy. *Turdus Fuscater* Lafresnaye and d'Orbigny, 1837, La Paz, Bolivia.
Distinctive race *ockendeni* merits further investigation; possibly a separate species. Geographical variation otherwise appears somewhat clinal. Seven subspecies recognized.
Subspecies and Distribution.
T. f. cacozelus (Bangs, 1898) – Sierra Nevada de Santa Marta, in N Colombia.
T. f. clarus Phelps, Sr & Phelps, Jr, 1953 – Perijá Mts, on NE Colombia–W Venezuela border.
T. f. quindio Chapman, 1925 – S & W Colombia and N Ecuador.
T. f. gigas Fraser, 1841 – E Andes of Venezuela and Colombia.
T. f. gigantodes Cabanis, 1873 – S Ecuador S to C Peru.
T. f. ockendeni Hellmayr, 1906 – SE Peru.
T. f. fuscater d'Orbigny & Lafresnaye, 1837 – W Bolivia.



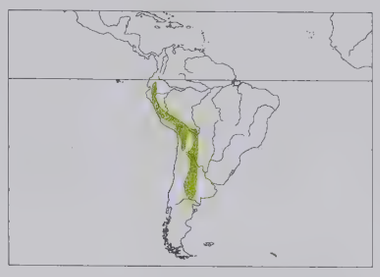
Descriptive notes. 28–33 cm; 128–175 g. Large, long-tailed thrush. Nominate race is olive-tinged grey-brown, darker above, paler below, with darker lores, dark streaking on pale greyish chin and throat, yellow-orange bill and eyering; legs brownish-yellow. Distinguished from very similar *T. chiguanco* mainly by larger size, presence of eyering, paler than Bolivian race *anthracinus* of latter. Sexes similar. Juvenile is paler with buff spots and streaks above, mottled buff and dark below. Races differ mainly in colour tone and size: *cacozelus* is palest, brownish-ochre tinge throughout, with relatively pale, buffy-olive underparts; *clarus* is larger and darker than previous; *quindio* is like nominate but marginally larger and darker, and more uniform below; *gigas* is like last but much larger; *gigantodes* resembles previous, but slightly smaller; *ockendeni* is darkest, male blackish above and below, very uniform from chin to vent, female marginally browner and paler. Voice. Song, from branch in middle level, infrequent (mostly in darkness before dawn, only in breeding season), melodious but weak, a series of rather varied, rapid, musical phrases each ending with high, nearly inaudible note, similar to songs of *T. chiguanco* and *T. migratorius*; in Venezuela apparently not weak but consists of loud thick whistles, "so clear-e, so clear-e, so clear-e", often mixed with nasal "nwee-nwee", high notes and dry trills, and after a few phrases drifting slowly and fluidly to new phrases. Calls include loud "keeyert!" and "kurt!-kurt!-kurt!-kurt!" in flight or when flushed; also incessant rising "kweep" or *Bombycilla*-like "eeeee".
Habitat. Cleared and partially opened areas, including fields, farmyards and gardens with hedges and patches of low woodland, borders of temperate and humid montane forest, elfin forest and secondary woodland, ranging up to tree-line, lower slopes of *páramo*, brushy slopes and montane scrub; sometimes in patches of *Polylepis* far above tree-line. At 1500–4250 m, mainly 1800–4100 m; in Colombia seldom below 2000 m, and in Ecuador mostly above 2500 m; in Venezuela 1600–4200 m. Recorded as roosting in flock in bulrushes (tules) in marshes.
Food and Feeding. Fruits and berries, also insects and earthworms. Forages on ground, especially on short-grass pastures and roadsides, but also regularly visits fruiting trees and shrubs.
Breeding. Mar–Apr in Venezuela; Jan–Aug, with fledglings Jan and food-carrying Sept, in Colombia; Oct in Ecuador, and Feb and Jun in Peru. Nest a very large bulky cup made of coarse twigs and leaves, lined with grass, placed low in shrub, in one case 4 m up in dense cluster of leaves at end of lateral limb of 9-m *Oreopanax* tree by small creek. Eggs 2, pale greenish-blue with reddish-brown spotting and underlying lilac blotches. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Common to very common; in many areas one of the most frequently seen bird species, particularly in N of range (S to Ecuador). In Colombia very common throughout highlands; present in Puracé National Park. In Venezuela very common, and evidently expanding in numbers and range. Very common even in cities, as in Quito (Ecuador) and La Paz (Bolivia). Quick to colonize new clearings in forest; has doubtless greatly increased in numbers in response to widespread deforestation within range. Alleged presence in Argentina erroneous, due to confusion with *T. chiguanco* of race *anthracinus*.
Bibliography. Borrero (1955), Chapman (1917, 1926), Clement & Hathway (2000), Fjeldså & Krabbe (1989, 1990), Hilty (2003), Hilty & Brown (1986), Kiff *et al.* (1989), Parker *et al.* (1985), Phelps & Phelps (1950), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Sclater & Salvin (1879), Vuilleumier & Ewert (1978), Walker (2001).

89. Chiguanco Thrush

Turdus chiguanco

French: Merle chiguanco **German**: Chiguancodrossel **Spanish**: Mirlo Chiguanco
Other common names: Dark Thrush (*anthracinus*)

Taxonomy. *T.(urdus) chiguanco* d'Orbigny and Lafresnaye, 1837, Tacua, Peru.
Race *anthracinus* distinctive, to extent that species status may be appropriate, but situation complicated, and its relationship to *T. fuscater* needs exploration. Race *conradi* often subsumed in nominate. Three subspecies recognized.
Subspecies and Distribution.
T. c. conradi Salvadori & Festa, 1899 – C Ecuador S to C Peru.
T. c. chiguanco d'Orbigny & Lafresnaye, 1837 – coastal Peru, W Bolivia and extreme N Chile.
T. c. anthracinus Burmeister, 1858 – S Bolivia and NE Chile S to WC Argentina.
Descriptive notes. 27–28 cm; 107 g. Nominate race is plain olive grey-brown, slightly paler below, with vague buffy throat streaks; bill and legs yellow; iris red to chestnut. Sexes similar. Juvenile is olive grey-brown above, with buff flecking on crown and wing-coverts, buffy supercilium and underparts with brown mottling. Race *conradi* is larger and paler than nominate; *anthracinus* is



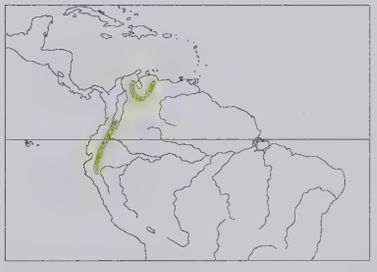
more sooty-black, with yellow eyering, female dark brown. Voice. Song, mainly at dawn and dusk and only in breeding season, from high branch, telephone line or rooftop, weak and relatively unmusical, a series of short and simple melodic phrases that end in jumble or twitter, each phrase repeated 2–3 times, "siblisirrilé seblesierrilli…", although also described (Argentina) as very beautiful and melancholy; similar to song of *T. fuscater*. Calls include typical clucking "duck-duck", sharp "tchok-kiek" for contact, loud rapid "tsi-tsi-tsi" in flight, and long-drawn, high-pitched "wheen" or "kiiiu" in alarm.
Habitat. Agricultural and semi-open areas with scattered trees, thickets and hedges, gardens, parks and light scrubby deciduous woodland with cacti, mainly in arid regions but usually near watercourses or in irrigated areas; also in bushy gorges in puna zone, *Polylepis* woodland, montane scrub, being most arboreal in far S of range. Will colonize roads through humid montane forest. Mostly 1500–4000 m, sometimes to 4300 m, but only to 3200 m in Ecuador and reaching lower, almost to sea-level, in Peru and Chile.
Food and Feeding. Earthworms, insects (including noctuid moth caterpillars), spiders; fruits of cultivated trees, also berries of *Condalia lineata*. Forages on ground in short grass in semi-open country.
Breeding. Breeding-condition bird in Dec and fledglings Jan and May–Jul in Peru; Jan and Mar–Apr, with fledglings Jun, in N Chile; fledglings Jan–Feb and Apr in Bolivia; eggs in Nov and Feb, a chick in Jan, fledglings Mar–Apr, in Argentina. Nest a solid cup of grass and slender twigs, placed low down (once 3 m) in small tree. Eggs 2–3, pale greenish-blue, with chestnut and grey spots and blotches. No other information.
Movements. Presumably sedentary; in Ecuador has been known to wander as far N as Volcán Pichincha.
Status and Conservation. Not globally threatened. Fairly common to common, and a rather familiar species. Possibly expanding its range N in Ecuador, since all records from Cotopaxi and Pichincha are post-1980. In Argentina, at least formerly (to 1950s), was taken for cagebird trade owing to fine singing voice.
Bibliography. Acerbo (1999), Canevari *et al.* (1991), Chapman (1926), Clement & Hathway (2000), Dorst (1955–1956), Fjeldså & Krabbe (1989, 1990), Krabbe (1992), Partridge (1953), Peña (1961), de la Peña (1987), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Salvador (1988), Schubart *et al.* (1965), Wetmore (1926).

90. Chestnut-bellied Thrush

Turdus fulviventris

French: Merle à ventre fauve **German**: Ockerbauchdrossel **Spanish**: Zorzal Ventricastaño

Taxonomy. *Turdus fulviventris* P. L. Sclater, 1858, Nova Grenada [= Bogotá].
Monotypic.
Distribution. NE Colombia and NW Venezuela, and from SC Colombia S to Ecuador and NW Peru.



Descriptive notes. 23–25 cm ; 69–71 g. Has black head and throat, brownish slate-grey upperparts merging with pure mid-grey breast, orange-chestnut lower underparts, olive-grey undertail-coverts; bill and eyering yellowish-orange; legs yellowish-brown. Sexes similar, female duller than male. Juvenile undescribed. Voice. Song (from canopy) infrequent and relatively mediocre for *Turdus*, a rather fast series of clipped, choppy phrases reminiscent of a mockingbird (Mimidae), with interspersed harsh trills and buzzy notes, "che'e'e'-chert chee-rt-ee e'r'r', chuwurt, titi, t't't, eet…"; sometimes mimics other species. Call a wooden "peent".
Habitat. All strata in humid subtropical montane forest, including stunted mossy cloudforest with many ericads, forest borders, tall second growth and shrubby disturbed areas, often on steep hillsides, and adjacent small clearings and roadsides; 1300–2700 m (mainly 1400–2600 m), but 1700–2300 m in Colombia.
Food and Feeding. Fruit, including berries. Usually forages in trees, but rarely seen in fruiting trees with other species; sometimes feeds amid leaf litter on ground in semi-open areas, such as roadsides and clearings.
Breeding. Apr–Aug in Colombia; fledgling in Feb in Peru; song mainly May–Jul in Venezuela. No other information.
Movements. Presumably mainly sedentary. Several records of individuals as low as 1000–1100 m in S Ecuador, Jul–Nov, may refer to post-breeding altitudinal movement; unaccountably erratic in abundance in Venezuela, generally easier to find in early part of rainy season, May–Jul.
Status and Conservation. Not globally threatened. Uncommon and nowhere numerous in Venezuela. Uncommon and rather local in Colombia, with puzzling apparent absence between known areas of occurrence to N & S; but common in W Putumayo. In Ecuador, appears more numerous in S than in N, and most numerous on outlying ridges of E Andes, e.g. Cordilleras de Huacamayos, de Cutucú and del Cóndor; fairly common across border in Peruvian sector of Cóndor (NE Cajamarca). Recorded as uncommon to fairly common in Podocarpus National Park, in Ecuador.
Bibliography. Clement & Hathway (2000), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Phelps & Phelps (1950), Rasmussen *et al.* (1994), Ridgely & Greenfield (2001), Ridgely & Tudor (1989).

91. La Selle Thrush

Turdus swalesi

French: Merle de La Selle **German**: Haitidrossel **Spanish**: Zorzal de la Española
Other common names: Swales's Thrush

On following pages: 92. Red-legged Thrush (*Turdus plumbeus*); 93. White-chinned Thrush (*Turdus aurantius*); 94. Rufous-collared Robin (*Turdus rufitorques*); 95. Black-hooded Thrush (*Turdus olivater*); 96. Rufous-bellied Thrush (*Turdus rufiventris*); 97. Austral Thrush (*Turdus falcklandii*); 98. Groundscraper Thrush (*Psophocichla litsitsirupa*).

Taxonomy. *Haplocichla swalesi* Wetmore, 1927, Massif de la Selle, 6000 feet [c. 1830 m], La Selle ridge, Haiti.
Two subspecies recognized.
Subspecies and Distribution.
T. s. swalesi (Wetmore, 1927) – S Haiti and SW Dominican Republic.
T. s. dodae Graves & Olson, 1986 – C Dominican Republic.



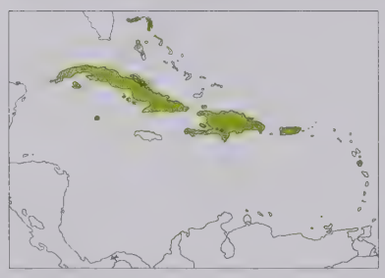
Descriptive notes. 26–27 cm; 88–110 g. Nominate race is blackish above, including soft-edged hood, shading to deep rufous-chestnut mid-belly and flanks, blackish thighs, white lower belly, white-tipped blackish vent; white throat streaks, yellow eyering; bill orange; legs blackish. Sexes similar. Juvenile undescribed. Race *dodae* has mantle, back and scapulars tinged grey-olive. VOICE. Song a long-sustained, slow and deliberately spaced series of loud, low, fluty phrases, e.g. "tu-re-oo" and "cho-ho-ho", followed by a "zeek", but also described as "bubbling, rollicking"; similar to that of *T. plumbeus*. Calls include loud "wheury-wheury-wheury" in alarm, and various gurgling notes.
Habitat. Dense shrubby understorey of subtropical moist montane broadleaf forest, also planted clearings within this, occasionally also pine forest with well-developed broadleaf ground layer; above 1300 m. In one study in La Visite National Park, in Haiti, more than 75% of records were from areas of "bwa raje" and "rak bwa" (disturbed or mesic patches of broadleaf forest unsuitable for cultivation, e.g. around sinkholes, in steep ravines, at steep rock faces and near limestone blocks).
Food and Feeding. Earthworms, insects and fruit, including *Persea anomala*; seen to take wild strawberries in grass at edge of trail. Forages mostly on ground, visiting open cultivated gardens adjacent to forest patches.
Breeding. May–Jul. Nest a bulky cup made mainly of moss, placed at low to middle height in shrub or tree. Eggs 2–3, greenish-blue with spots. No other information.
Movements. Apparently sedentary.
Status and Conservation. ENDANGERED. Restricted-range species: present in Hispaniola EBA. Population placed in range 2500–10,000 individuals, and considered declining. Formerly common in La Visite National Park, in Haiti, but may now be extinct in entire country owing to clearance of broadleaf forest; suggestion that partial clearance for gardens may have allowed a population increase considered very unlikely. Elsewhere, fairly common within very limited, patchy range. Chronic, extensive habitat loss throughout Hispaniola continues in montane regions, and suitable habitat in Dominican Republic remains only in Sierra de Baoruco (nominate race) and Cordillera Central and Sierra de Neiba (race *dodae*); population appears to be at fairly high density in latter, at least above Vuelta de Quince. Present in Sierra de Bahoruco and Armando Bermúdez National Parks, in Dominican Republic. These reserves need stronger support, and other areas where the species occurs require formal protection. Status survey also an urgent priority in both countries.
Bibliography. Anon. (1998b), Bond (1956b, 1979), Clement & Hathway (2000), Collar *et al.* (1992), Raffaele *et al.* (1998), Rimmer *et al.* (2003), Stattersfield & Capper (2000), Stockton (1987, 1992), Wetmore & Swales (1931), Woods & Ottenwalder (1986).

92. **Red-legged Thrush**

Turdus plumbeus

French: Merle vantard **German**: Rotfußdrossel **Spanish**: Zorzal Patirrojo
Other common names: Eastern Red-legged Thrush (*ardosiaceus*, *albiventris*); Western Red-legged Thrush (other races)

Taxonomy. *Turdus plumbeus* Linnaeus, 1758, America [= Islands of Andros and Ilathera (Bahamas)].
Frequently placed in a separate genus, *Mimocichla*. Has been suggested that E races *ardosiaceus* and *albiventris* warrant treatment as a separate species. Six subspecies recognized.
Subspecies and Distribution.
T. p. plumbeus Linnaeus, 1758 – N Bahama Is.
T. p. rubripes Temminck, 1826 – W & C Cuba and I of Pines.
T. p. schistaceus (S. F. Baird, 1864) – E Cuba.
T. p. coryi (Sharpe, 1902) – Cayman Is (Cayman Brac).
T. p. ardosiaceus Vieillot, 1822 – Hispaniola (including I de la Tortue, I de la Gonâve) and Puerto Rico.
T. p. albiventris (P. L. Sclater, 1889) – Dominica.



Descriptive notes. 25–28 cm; 50–82 g. Nominate race is slate-grey above, with black throat, short white submoustachial and chin, black tail, wing feathers with pale grey outer vanes and blackish inner ones; underparts mid-grey; bill blackish; eyering and legs orange-red. Sexes similar. Juvenile is lightly mottled blackish above, buffier with black spotting below, bill pale yellowish. Race *schistaceus* is like nominate but with more white at base of bill, red bill; *rubripes* has still more white at base of bill, orange-buff belly to vent, coral-red bill; *coryi* resembles previous but smaller, with white malar; *ardosiaceus* has chin and throat boldly striped black and white, coral-red bill; *albiventris* is like last, but with shorter wing, longer legs, whiter belly, and yellow bill, eyering and legs. VOICE. Song a melodious but laboured and monotonous series of phrases of 1–3 syllables, "chirruit, chirruit eeyu biyuyu pert, squeer squit, seeer cheweap, screeet chirri", recalling Pearly-eyed Thrasher (*Margarops fuscatus*); song of race *ardosiaceus* includes regular sharp "pit" note between phrases; mimics other birds. Calls include rapid high-pitched "weecha weecha weecha" or "cha-cha-cha" or "chu-week chu-week chu-week", also weak sibilant "slee", and loud high "wiit-wiit" or "wet-wet" in alarm.
Habitat. Woodlands and forests at all elevations and of all types (semi-deciduous, pine), casuarinas, coppice, scrub, cactus brush, thick undergrowth, groves in cultivated terrain, wooded gardens and shade coffee plantations; favours riparian habitats and vicinity of permanent water, especially in drier areas. Occurs in urban areas in Cuba and Hispaniola and on Caymans.
Food and Feeding. Invertebrates, small vertebrates and fruits. Invertebrates include roaches (in one case *Epilampra saublosa*), snails, millipedes, cutworms, spiders, ants, wasps, grasshoppers, crickets, bugs, earwigs, mole-crickets, caterpillars and beetles (in one case *Lachnosterna hogradi*). Vertebrates taken are small snakes, frogs and lizards; bird eggs also eaten. Fruits include those of royal palm (*Roystonea borinquena*), bourbon palm (*Livistona chinensis*), wild fig (*Ficus*), laurel (*Phoebe elongata*) and moral (*Cordia sulcata*), drupes (*Vitex*), small red peppers (*Capsicum frutescens*); berries and seeds also taken. Of 22 stomachs from Puerto Rico, all months except Jun–Jul, three held only animal matter, eleven only vegetable matter, and eight both; of 36 stomachs from Puerto Rico, Jan–Aug, 63% held vegetable matter and 37% animal matter. Food brought to nestlings in Puerto Rico mainly drupes, small insects, tree-frogs and lizards. Forages mainly on ground among leaf litter, coming out on to shady mountain roads in twilight. Takes fruit in trees, sometimes by means of hover-gleaning; seen to take flies and ants from small red *Capsicum* peppers.
Breeding. Jan–Sept (peak Apr–Jul) throughout range, but extending to Nov in Cuba; Apr–May on I of Pines, Mar–Sept on Cayman Brac and May–Aug in Bahamas. Territory in Puerto Rico as small as 0·1 ha, with smallest inter-nest distance 8 m. Nest a bulky mass of leaves, rootlets, bark, banana fibres and mud, lined with grass, pine needles and other material, usually 2–9 m up in tree, e.g. casuarina or palm, on stump or under house eaves, often in guttering; once placed in mass of orchids 3·5 m up on branch, once on ground. Eggs 2–4, in Cuba 3–5, pale greenish-white to greenish-blue with heavy reddish-brown speckles; incubation period at least 11 days; nestling period 11–12 days.
Movements. Apparently sedentary. In Cayman Is, race *coryi* occasionally visits Little Cayman to forage.
Status and Conservation. Not globally threatened. Common and widespread within range. In Cuba, familiar around human settlements, and considered probably the commonest bird of terrestrial ecosystems; common on I of Pines. Fairly common on Cayman Brac when breeding, but rarely seen at other times of year; total population of this race (race *coryi*) in Apr 1996 estimated at 28,000 individuals. Race *rubripes* formerly occurred also in Swan Is (N of Honduras), but now extinct there; evidently common in 1887, and disappearance unexplained, but possibly related to forest disturbance.
Bibliography. Anon. (1998b), Barbour (1923), Bond (1956b, 1979), Bradley (1985, 2000), Brudenell-Bruce (1975), Clement & Hathway (2000), Evans (1990), Garrido & Kirkconnell (2000b), González (2002), Johnston (1969), Lack (1976), Monroe (1968), Oberle (2000), Phillips (1991), Raffaele (1989), Raffaele *et al.* (1998), Rolle (1963), Todd (1916), Vaurie (1957), Wetmore & Swales (1931), Woods & Ottenwalder (1986).

93. **White-chinned Thrush**

Turdus aurantius

French: Merle à miroir **German**: Weißkinndrossel **Spanish**: Zorzal Gorgiblanco
Other common names: Roadside Thrush

Taxonomy. (*Turdus*) *aurantius* J. F. Gmelin, 1789, "in Jamaicae montibus" = mountains of Jamaica.
Monotypic.
Distribution. Jamaica.



Descriptive notes. 24–26·5 cm; 82 g. Plumage is glossy dark brownish-grey above, shading to mid-grey below, palest on belly and flanks, with white wing patch, chin, mid-belly and vent tips; orange bill and legs. Sexes similar. Juvenile like adult but has reddish-brown crown to upper back, reddish-brown breast and flanks, white on chin absent or reduced. VOICE. Song, given late Feb to Aug, a musical lullaby-like "turé-too-too", repeated indefinitely, recalling that of *T. migratorius* but much richer in tone and more mournful. Calls include shrill whistling "p'liss, p'liss" and prolonged chicken-like clucking.
Habitat. Forests, woodland, road edges, citrus and banana plantations, pastures, cultivated areas and gardens in mountains, at middle and high elevations; less frequent in lowlands, but down to sea-level on N & SW coasts. More tolerant of disturbed vegetation than is *T. jamaicensis*. Comes out on to roadsides in twilight and after rain.
Food and Feeding. Slugs, snails, insects and their larvae (including moths), earthworms, berries, frogs, tree-toads, small mice, fledgling birds and lizards; lizards form substantial part of diet. Fruits (41% and 44% of diet in separate studies) include *Nectandra antillana* (Lauraceae), *Bursera simaruba* (Burseraceae), *Bumelia salicifolia* (Sapotaceae), *Fagara martinicensis* and *F. elephantiasis* (Rutaceae), *Cupania glabra* (Sapindaceae), *Oreopanax capitatus* (Araliaceae) and *Dunalia arborescens* (Solanaceae); also *Cecropia peltata*, and bitterwood, pimento, coffee and citrus seeds. Food given to nestlings includes masticated lizards and worms, small bugs, crickets. Forages mainly on ground amid leaf litter; once seen to search in cow dung.
Breeding. Mainly May–Jul, second brood extending into Aug. Nest a coarse untidy cup of leaves, fibrous roots, twigs and interwoven bits of bamboo and banana, lined with fine material, placed in shrub, tree (e.g. mango), bromeliad or base of palm frond; nest reused for second brood. Eggs 2–3, occasionally 4, dull whitish to pale greenish with reddish-brown blotches; incubation period 16 days; second brood starts 11 days after first brood fledges.
Movements. Sedentary; claimed that some move to lower elevations in non-breeding season, but this may be a function of greater detectability of lowland populations after breeding.
Status and Conservation. Not globally threatened. Restricted-range species: present in Jamaica EBA. Very common and widespread. Formerly, at least, was regarded as good eating, and frequently taken in ground traps set for doves (Columbidae), but no evidence of adverse impact from human activity.
Bibliography. Anon. (1998b), Bond (1956b, 1979), Clement & Hathway (2000), Downer & Sutton (1990), Lack (1976), Levy & Downer (1992), Raffaele *et al.* (1998).

94. **Rufous-collared Robin**

Turdus rufitorques

French: Merle à col roux **German**: Rotnackendrossel **Spanish**: Zorzal Cuellirrufo

Taxonomy. *Turdus* (*Merula*) *rufitorques* Hartlaub, 1844, Guatemala.
Has in the past been thought to form a superspecies with *T. migratorius* on account of behavioural and vocal similarities, but plumages rather different. Monotypic.
Distribution. SE Mexico, Guatemala, El Salvador and SW Honduras.



Descriptive notes. 23–25·5 cm; 70–74 g. Male is black, with clear-cut broad rufous-orange collar extending to (dark-streaked) chin and mid-belly; bill and legs yellow. Female is greyish-brown, with soft-edged orange-buff collar extending onto breast and belly, shading olive on flanks and belly, with streaked throat and buff-tipped vent; bill and legs yellow. Both sexes occasionally blackish-brown with faint suggestion of collar. Juvenile is dark-spotted orange-buff on head and underparts, whitish throat, blackish on upperparts, with orange-buff chevrons and teardrops on mantle to scapulars; immature male dark slaty-olive above, dull cinnamon-rufous collar, white chin, cinnamon-buff to cinnamon-rufous breast with variably darker underparts, rusty axillaries, whitish shaft streaks on undertail-coverts, immature female similar but duller. Voice. Song, from prominent high perch, a hesitant rich repetitive caroling, "cheer chrri-chrri chree-ip chree-ip chee cheer…", similar to that of *T. migratorius*. Calls include clucking "cheik-chuk-chuk" and "kweh-kweh-kweh", sharper "wheuk" and high "ssir".
Habitat. All strata in cloudforest, pine and pine–oak woodland and edge, brush, field edges, grassy clearings, villages; 1500–3500 m.
Food and Feeding. Dietary details not recorded. Often forages on ground. Frequently in flocks outside breeding season, and roosts socially.
Breeding. Eggs plain blue. No other information.
Movements. Apparently sedentary; some displacements noted in El Salvador.
Status and Conservation. Not globally threatened. Restricted-range species: present in the North Central American Highlands EBA. Fairly common to common. In Guatemala, reported as abundant at 2000–3300 m.
Bibliography. Anon. (1998b), Clement & Hathway (2000), Friedmann *et al.* (1957), Gómez de Silva *et al.* (1999), Griscom (1932b), Howell & Webb (1995), Land (1970), Marshall (1943), Phillips (1991).

95. **Black-hooded Thrush**

Turdus olivater

French: Merle à froc noir **German**: Kapuzendrossel **Spanish**: Zorzal Cabecinegro
Other common names: Olive-backed Thrush; Cauca Thrush (*caucae*)

Taxonomy. *Merula olivatra* Lafresnaye, 1848, Caracas, Venezuela.
Has been suggested that race *caucae* merits elevation to species rank, but it is morphologically only moderately distinct. Eight subspecies recognized.
Subspecies and Distribution.
T. o. sanctaemartae (Todd, 1913) – N Colombia (Santa Marta).
T. o. caucae (Chapman, 1914) – SW Colombia.
T. o. olivater (Lafresnaye, 1848) – mountains of N & W Venezuela and adjacent Colombia.
T. o. paraquensis Phelps, Sr & Phelps, Jr, 1946 – Cerro Paraque (S Venezuela).
T. o. kemptoni Phelps, Sr & Phelps, Jr, 1955 – Cerro de la Neblina (S Venezuela).
T. o. duidae Chapman, 1929 – S Venezuela (NW Bolívar, N Amazonas).
T. o. ptaritepui Phelps, Sr & Phelps, Jr, 1946 – SE Venezuela (SE Bolívar).
T. o. roraimae Salvin & Godman, 1884 – SE Venezuela, W Guyana and adjacent extreme N Brazil.



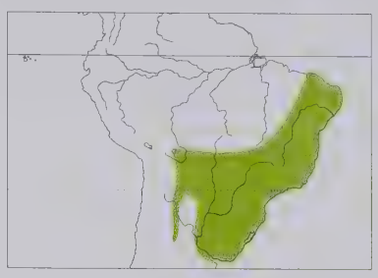
Descriptive notes. 23–24 cm; 70–85 g. Male nominate race has black hood, dark olive-brown upperparts, sandy-orange underparts; yellow bill, narrow eyering and legs. Female is similar, but has brown hood only vaguely defined below and flecked buff on face and throat, paler belly with darker-tipped vent. Juvenile is like female, but with double orange-spotted wingbars, dark-mottled throat and breast. Race *caucae* male lacks hood, is dark (but not black) on head, with smudgily dark-streaked off-white throat and upper breast; *sanctaemartae* is like nominate, but breast pale brown, lower breast with olive-brown edges; *paraquensis* has buff and black throat streaks, rufous-buff underparts; *kemptoni* is similar to previous, but belly darker; *duidae* is also similar, but with less contrast between upperside and underside; *roraimae* has less clear-cut hood above, black-streaked olive-brown throat; *ptaritepui* is very like last, but somewhat warmer and browner above and below. Voice. Song, from perch in middle strata or in canopy, a series of loud, rather slow, musical phrases, "tee-urr turee tuu-duu tuu-dii churdur turee" and "chur-dii", sometimes interpolated with higher, thinner "ee'ee" notes.
Habitat. Lower storey to canopy and borders of humid montane forest and secondary woodland, and in shade coffee; 600–2600 m, but 1200–2300 m in Colombia.
Food and Feeding. Dietary details not recorded. Forages on ground, flipping over leaf litter; sometimes attends army-ant swarms. Forages also in fruiting trees, especially melastomes, when may join with other species.
Breeding. Jan–Jul. Nest made of mud and moss, placed low down. Eggs 2–3, pale blue with purple and light brown spotting. No other information.
Movements. Presumably sedentary. Possibly short-distance migrant in Venezuela, where sharp seasonal and/or local swings in numbers. Recorded once in Suriname.
Status and Conservation. Not globally threatened. Fairly common to common; numerous in tepuis of SE Venezuela, but uncommon elsewhere in this country. Race *caucae* of SW Colombia may be threatened by widespread deforestation in upper Cauca Valley; not reported in recent decades, and may be extinct. Occurs in several protected areas, e.g. Isla de Salamanca National Park (Colombia), and Macarao and Canaíma National Parks (Venezuela).
Bibliography. Chapman (1917), Clement & Hathway (2000), Donahue (1939), Hilty (2003), Hilty & Brown (1986), Phelps & Phelps (1950), Ridgely & Tudor (1989), Todd & Carriker (1922).

96. **Rufous-bellied Thrush**

Turdus rufiventris

French: Merle à ventre roux **German**: Rotbauchdrossel **Spanish**: Zorzal Colorado
Other common names: Red-bellied Thrush

Taxonomy. *Turdus rufiventris* Vieillot, 1818, Brazil.
Two subspecies recognized.
Subspecies and Distribution.
T. r. juensis (Cory, 1916) – NE Brazil.
T. r. rufiventris Vieillot, 1818 – E Bolivia, S Brazil, Paraguay, N Argentina and Uruguay.



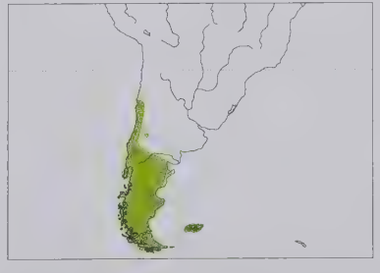
Descriptive notes. 23–25 cm; 68–82 g. Nominate race has olive-brown upperparts with browner wings and tail, brown-streaked whitish throat, buff-brown breast, pale orange on remaining underparts; orange-yellow eyering; bill dull yellow, darker base to upper mandible; legs dull greyish. Sexes similar. Juvenile is like adult above, but with buff streaks from crown to scapulars, orangey tips of wing-coverts, orange-buff with extensive brown mottling from chin to mid-belly, plainer and buffier from mid-belly to vent; immature loses streaks above, buffier lower underparts replaced with rufous, but breast spotting retained. Race *juensis* is smaller but longer-billed than nominate, paler above, creamier on breast. Voice. Song, from cover in tops of low trees, a fast rich caroling, loud, continuous and usually varied (locally, simple and monotonous), in quality among the best turdid songsters in South America, "tü tie tütü tie juiet juiet" or "peur peeáy peur peeáy peur peeáy peur peeáy". Calls include low clucking "pup-pup", "djok", warning "tsri", resonant "juh-jóéit, drew-wip"; descending sequence of c. 10 "drewuh" notes used in non-breeding territorial defence.
Habitat. Light woodland, second growth, semi-open forest thickets, savannas, *chaco*, *pampas*, brush, forest borders, agricultural land with groves of trees and patches of bushes, villages, clearings, parks and gardens, even in urban areas, coming on to lawns when habituated; in dry regions more or less restricted to areas near water. Sea-level to 2200 m; to 2600 m in Bolivia (Cochabamba).
Food and Feeding. Invertebrates and fruit, with more of latter. Invertebrates include especially earthworms, but also woodlice, spiders and insects (notably beetles, flies, ants). Wild fruits include berries of *Syagrus romanzoffiana*, *Rapanea laetevirens*, *Miconia cinerascens*, *Psychotria* and Solanaceae; in S Brazil 28 different fruit species reported, including *Rapanea acuminata*, *R. ferruginea*, *R. gardneriana*, *R. guyanensis*, *R. lineata* and *R. schwackeana*. Forages on ground close to cover, occasionally along open borders of lagoons and pools.
Breeding. Fledglings Jan–Feb in Bolivia, mainly Aug–Nov but extending to Jan in Brazil, and Oct–Feb in Argentina; typically double-brooded in Argentina. Nest in one instance a cup of dried stalks and some fresh green material, lined with rootlets, rimmed with cow dung and placed 1·3 m up in tree close to trunk, another had solid cup of hardened earth, a third was mostly of green moss and sited c. 2·4 m up in crotch of small tree in dense low wood, a fourth 1·8 m above ground in *Astronium urundeuva*. Eggs 2–6, usually 3, greenish or bluish with brick-red, chestnut or brownish spots and blotches; incubation period 13–15 days; nestling period 13–14 days; post-fledging dependence 14 days. Brood parasitism by Shiny Cowbird (*Molothrus bonariensis*) occurs, and reduces productivity.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common and adaptable. In Brazil, occurs in gardens in Rio de Janeiro city, and abundant in Rio Grande do Sul, but seemingly much less numerous in much of NE of the country. Mostly common in Paraguay, and very common in Uruguay. In 1920s concern was expressed that hunting in Argentina needed to be curbed in order for this species to maintain numbers, but it seems to have suffered little from this pressure, and currently judged the commonest thrush within its range in the country.
Bibliography. de Andrade (1992), Antas & Cavalcanti (1988), Belton (1985), Canevari *et al.* (1991), Clement & Hathway (2000), Di Giacomo & López (1998), Fjeldså & Krabbe (1990), Gore & Gepp (1978), Gridi-Papp *et al.* (2004), Guix & Ruiz (1995), Hayes (1995), Lichtenstein (1998, 2001), de la Peña (1987, 1996), Pineschi (1990), Ridgely & Tudor (1989), do Rosário (1996), Rougés & Blake (2001), Sackmann & Reboreda (2003), Short (1975), Sick (1985, 1993), Snethlage (1927–1928), Voss & Sander (1980, 1981), Wetmore (1926).

97. **Austral Thrush**

Turdus falcklandii

French: Merle austral **German**: Magellandrossel **Spanish**: Zorzal Patagón
Other common names: Falkland Thrush (nominate); Magellan Thrush (*magellanicus*)

Taxonomy. *Turdus falcklandii* Quoy and Gaimard, 1824, Falkland Islands.
Birds from Mocha I (S Chile) described as race *mochae*, supposedly somewhat paler and with bill on average longer than *magellanicus*, but considered insufficiently differentiated. Two subspecies recognized.
Subspecies and Distribution.
T. f. magellanicus P. P. King, 1831 – C & S Chile (including Juan Fernández Is) and S Argentina.
T. f. falcklandii Quoy & Gaimard, 1824 – Falkland Is.



Descriptive notes. 23–26·5 cm; 95–113 g. Nominate race is warm brownish-olive above, with head blackish-brown to below eye, chin and throat stippled buffy and blackish, merging into ochre underparts; bill, narrow eyering and legs orange-yellow. Sexes similar. Juvenile is similar to adult, but with heavy buff streaking above, buffy-yellow with dark brown spots below. Race *magellanicus* is smaller than nominate, colder olive-brown above with blacker head, paler below, more distinct throat pattern, female somewhat paler. Voice. Song, from treetop well into night, variously considered "weak" and "rich", a sustained series of measured, muted caroling phrases, each repeated several times, "juiep tiele chuii juiep chie"; occasional mimicry. On Falklands (nominate race), where also delivered from bush, clump, roof and even ground, varies in quality but usually a plaintive, slow succession of whistles and harsh chuckles, with loud "piiuu" or "tii" often repeated and alternating with low churring; given in spring and autumn. Subsong (Falklands) resembles muted version of full song of *T. merula*. Calls include low "huit", harsh "wreet" and "trrrt trrrt"; in Falklands a "purr" in agitation, "chirrrp" at nest, strong

"choyz-choyz-choyz" in alarm, low buzzing "chiz-chiz" in courtship, deep harsh "skwuk" at intruders.

Habitat. Open understorey of dark *Nothofagus* forest to open forest, plantations, second growth, lighter open woodland, forest borders, riparian willows, brushy country, agricultural areas with scattered trees and hedges, and gardens; sea-level to 2150 m. In Falklands occupies variety of habitats, particularly on tussac islands and in human settlements where bushes, trees and sheds offer shelter, but also among rocky outcrops and open slopes with ferns and diddle-dee (*Empetrum rubrum*); greatest population density in mature tussac adjoining boulder beach with accumulated dead kelp.

Food and Feeding. Worms, snails, and arthropods (including insect larvae and pupae and, in Falklands, sandhoppers); also much fruit, and in Chiloé (Chile) the main agent of seed dispersal of macho macho (*Podocarpus nubigena*). In winter months, Falklands, recorded as taking berries, especially of pigvine (*Gunnera magellanica*), also diddle-dee berries, cultivated currants and strawberries; also, especially in frosty weather, readily takes household scraps (bread, mutton fat). Two stomachs from Tierra del Fuego, winter, held beetles, larvae, hemipteran bugs and a blade of grass. Feeds mostly on ground, hopping about on grassy lawns and pastures, but preferring soft soil in shady places; in Falklands forages among sea-wrack. Also takes much fruit in trees. Has been seen to kill Blackish Cinclodes (*Cinclodes antarcticus*) and Grey-backed Storm-petrels (*Garrodia nereis*).

Breeding. Sept–Feb in Chile; at least Oct–Nov in Argentina, where also a nest with 1 egg in Jan; Aug–Dec in Falkland Is; up to three broods, occasionally four in Falklands. Nest (Falklands) a large, deep cup of dry grass stems and root fibres, sometimes with wool or string, usually internally walled with mud or dung and lined with grass or horsehair, placed in sheltered crevice among rocks, atop herb-sheltered bank or large tussac pedestal, in cypress or gorse bush, or on beam in wool shed. Eggs 2–3, blue-green with brown and purple markings; incubation period 14–16 days; nestling period 16–18 days; interval between fledging and start of new brood as little as 12–14 days. Of 200 ringed individuals studied over 6 years, greatest longevity was only 4·5 years.

Movements. Sedentary or with partial displacements. Disperses short distances in winter on mainland; in marked population of 200 individuals in Falklands, longest movement recorded was 3·6 km in just over 6 months.

Status and Conservation. Not globally threatened. Common to abundant in Chile and Argentina. In Falklands, expanded range dramatically in period 1930–1960; total population probably now c. 6000 pairs (estimate 4000–8000 pairs), highest density 4 males/ha (in mature coastal tussac). Subject to considerable predation by introduced predators, especially cats; in comparable habitats (paddocks of replanted tussac and short turf), density 2·6 males/ha where cats, rats and mice absent, but only 0·38/ha where they were present. High reproductive output appears, however, to counterbalance elevated predation effects.

Bibliography. Canevari *et al.* (1991), Cawkell & Hamilton (1961), Clement & Hathway (2000), Estades & Tomasevic (2000), Fjeldså & Krabbe (1990), Humphrey *et al.* (1970), Parmelee & Rasmussen (1994), de la Peña (1987), Ridgely & Tudor (1989), Wetmore (1926), Willson *et al.* (1996), Woods (1970, 1975, 1984, 1988), Woods & Woods (1997).

Genus *PSOPHOCICHLA* Cabanis, 1860

98. Groundscraper Thrush

Psophocichla litsitsirupa

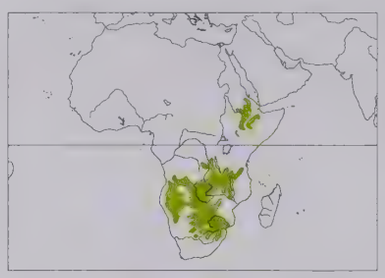
French: Grive litsitsirupa **German**: Akaziendrossel **Spanish**: Zorzal Litsitsirupa
Other common names: Ethiopian Thrush (*simensis*)

Taxonomy. *Merula litsitsirupa* A. Smith, 1836, between the Orange River and the Tropic of Capricorn, southern Africa.

Often placed in genus *Turdus*, but perhaps more closely related to *Zoothera*. Races *stierlingi* and *pauciguttata* considered of doubtful validity. Four subspecies recognized.

Subspecies and Distribution.

P. l. simensis (Rüppell, 1840) – Eritrea and Ethiopia.
P. l. stierlingi (Reichenow, 1900) – C & E Angola E to Tanzania.
P. l. pauciguttata Clancey, 1956 – S Angola, N Namibia, NW Botswana and W Zimbabwe.
P. l. litsitsirupa (A. Smith, 1836) – C Namibia and S Zambia S and E to N South Africa, Swaziland and S Mozambique.



Descriptive notes. 20–22 cm; 67–84 g. Mid-sized, broad-winged, short-tailed thrush with *Zoothera* face pattern and *Turdus* wing pattern; sometimes flicks one wing at a time. Nominate race is pale grey-brown from crown to tail, darker flight-feathers with broad orange-buff patches on inner webs (invisible when perched, forming bold wing area in flight and when wings flicked); face and underparts buffy-white, broad black vertical subocular stripe, broad black auricular stripe and narrow black malar, lines of blackish spots radiating from breast to lower belly; bill blackish, orange lower mandible; legs yellowish. Sexes similar, female generally less heavily spotted than male. Immature is like adult, but browner with buff spotting above, stronger buffy tinge below. Race *simensis* is warmer brown above, suffused buff below; *stierlingi* is darker-marked above, notably on crown, whiter below; *pauciguttata* is relatively pale, with fewer spots. Voice. Song a variety of loud, slow, short phrases of 4–8 notes combining rather unmelodious whistles and grating clicks, "tsiiiuu-tsitsu-choi choi-chichi-choi whiii-pu-chichichichit pachau chii-puchewi pachau chacha-whiiu-pu-chii-cho", etc. Call "tsi-tsi-tsi-rufa", and several hollow-sounding clicks and chuckles in alarm. Sometimes mimics other species.

Habitat. Moorland, grassland, open woodland, secondary growth, cultivated or grazed land, gardens; rarely in denser woodland, where replaced by *Turdus libonyanus* or *T. olivaceus*. In Eritrea and Ethiopia mainly in montane *Hagenia* and bamboo, and moorlands with *Hypericum*, heath and grass, at 1800–4100 m. In DRCongo, occurs to c. 2000 m. In SC Africa in open or secondary miombo, acacia and mopane woodlands, in Tanzania at 900–1900 m, Angola c. 500–1800 m, Malawi 900–1520 m, Zimbabwe below 1600 m. In S Africa, occurs in any open woodland (*Acacia* and broadleaf, especially miombo, but absent from latter in parts of Zimbabwe and Mozambique) with sparse understorey and patches of bare ground, e.g. overgrazed woodland, gardens in dry regions, alien plantations (e.g. *Eucalyptus* in highland grasslands), orchards, playing fields, and around small-scale agricultural clearings.

Food and Feeding. Insects and their larvae, e.g. flies, termites, grasshoppers, beetles; also spiders, isopods, slugs, earthworms, skinks and fruit. Forages on open ground, scraping in leaf litter; sometimes arrives at burnt ground within 24 hours of a fire, and may even hawk prey in flight above fires.

Breeding. Jun–Aug in Eritrea and Mar–Jul in Ethiopia; Jul–Sept in DRCongo, Aug and Oct–Dec in Tanzania, and Sept–Oct in Malawi and Angola; Aug–Oct and Jan in Zambia; Oct–Mar in Namibia, Aug–Mar in Botswana, and Aug–Jan (peak Sept–Nov) in Zimbabwe; mainly Aug–Jan (peak Sept/Oct–Nov) in South Africa; two broods. Sometimes breeds co-operatively; up to four adults seen to feed young. Nest a bulky open cup of roots, tendrils, twigs and long stems (especially of *Helichrysum*) with wool and dung added, sometimes lined with rootlets and grass, placed 1·5–7 m up usually in tree fork, often against main trunk or in horizontal fork, often over water and/or in association with Fork-tailed Drongo (*Dicrurus adsimilis*). Eggs 1–4, usually 3, pale creamy-blue to greenish-blue blotched with lilac, grey and reddish-brown; incubation period 14–15 days, by both sexes; nestling period 16 days, with parental care for up to further 6 weeks; second brood may begin before independence of first. One record of parasitism by Red-chested Cuckoo (*Cuculus solitarius*).

Movements. Mainly resident. Perhaps a migrant through SW Tanzania, where all records Aug–Nov. In Zambia some move S in Dec–Feb (rains), returning Mar–Jul, while others appear to be absent Aug–Oct, but this not supported by patterns from S Africa, where some evidence of dry-season movement from arid areas in SW to more mesic N & E, as well as movement away from some mesic sites. Rapidly appears at newly burnt areas or fire outbreaks.

Status and Conservation. Not globally threatened. Generally frequent to common throughout rang; uncommon in SW Tanzania, Malawi, SW Mozambique, and Free State (South Africa). In S Africa, has probably expanded its range in response to tree-planting in open arid and grassland areas, but also must have lost habitat through clearing of miombo.

Bibliography. Anon. (1971), Aspinwall (1981), Barbour (1968), Benson (1946a), Benson & Benson (1977), Britton (1980), Broadley (1974), Brown & Britton (1980), Cackett (1970), Chapin (1953), Cheesman & Sclater (1935), Clancey (1956), Clement & Hathway (2000), Cole (1984), Craib (1970), Day (1987), Dean (1987, 2000), van Dijk (1997), Fraser (1985), Harrison *et al.* (1997), Hezekia (1987b), Irwin (1981, 1983b, 1984), Irwin & Benson (1966), Koen (1988), Lippens & Wille (1976), Maclean (1993), McKibbin (1991), Milstein (1968), Parker (1999), Sinclair (1984), Sinclair & Ryan (2003), Skinner (1995), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Tarboton & Clinning (1977), Tarboton *et al.* (1987), Traylor (1965), Urban *et al.* (1997).

PLATE 61 ➤



PLATE 61

inches 4

cm 10

Genus *NESOCICHLA* Gould, 1855

99. Tristan Thrush

Nesocichla eremita

French: Grive de Tristan da Cunha **German**: Tristandrossel **Spanish**: Zorzal de Tristán da Cunha
Other common names: Hermit Thrush(!)

Taxonomy. *Nesocichla eremita* Gould, 1855, Tristan da Cunha Island.
Presumably derived from South American *Turdus* (resembles immature *T. falcklandii*), but adaptation to insular life includes modified tongue, and maintenance of separate genus appears appropriate. Three subspecies recognized.
Subspecies and Distribution.
N. e. eremita Gould, 1855 – Tristan da Cunha.
N. e. gordoni Stenhouse, 1924 – Inaccessible I.
N. e. procax Elliott, 1954 – Nightingale I and satellites (Middle I, Stoltenhoff I).



Descriptive notes. 22–23 cm; 72–110 g. Nominate race is dull brown above with double orangey-spotted wingbars; below, orange-buff with lines of dark brown blotchy streaks, mid-buff vent; bill blackish; legs dusky-flesh. Sexes similar. Juvenile has pale buff spotting and streaking on upperparts. Race *gordoni* is larger than nominate, more spotted than streaked below, face paler and more flecked; *procax* is larger, darker, with darker orange underwing. Voice. Song a twittering combination of calls, "chissik, chissik, swee, swee, swee". Calls include short hissing wheezy "swee" and soft chirping "chissik".
Habitat. Occupies wet heath, fern-bush, tussock grassland, gardens, and boulder-strewn shorelines.
Food and Feeding. Opportunistic generalist and omnivore. Takes beetles, flies and maggots, caterpillars, spiders, mites, woodlice and earthworms; particularly fond of seabird eggs (tongue modified to extract contents), and plunders nestlings and fledglings of other landbirds, e.g. buntings (*Neospiza*) and Inaccessible Rail (*Atlantisia rogersi*); also dead seabirds, fish offal and kitchen scraps; seeds of *Empetrum* and *Nertera*, leaves of *Phylica*, marine algae; will even attack and kill adult White-bellied Storm-petrels (*Fregetta grallaria*). Forages on ground and on every available substrate within range, including close to surf zone on seashore.
Breeding. Sept–Feb. Nest a rough cup of woven tussock fronds and grass stalks with a few green leaves and pieces of moss, placed on or just above ground at base of thick clump of *Spartina*, occasionally on cliff ledge. Eggs 2–3, sometimes 4 (race *gordoni*), pale turquoise with ginger-brown speckles and mauve blotches; no information on incubation period; fledging period c. 20 days.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Tristan Islands EBA. In 1972–1974, numbers estimated as 40–60 individuals on Tristan da Cunha, 100–500 on Inaccessible I, 300–500 on Nightingale I, 20–40 on Middle I and 10–20 on Stoltenhoff I; global total thus 470–1120. More recently, population on Tristan has been reckoned to number several hundred, that on Inaccessible 850 pairs, and global total c. 6000 individuals. Predation by black rat (*Rattus rattus*) may be a threat on Tristan da Cunha, where feral cats were a major problem before being eradicated. Nightingale I race *procax* was earlier introduced (illegally) on to Tristan when local population (nominate) had dropped to a just a few individuals.
Bibliography. Broekhuysen & Macnae (1949), Clement & Hathway (2000), Elliott (1957), Flint (1967), Fraser *et al.* (1994), Hagen (1952), Richardson (1984), Ryan & Moloney (1991), Stattersfield & Capper (2000), Voisin (1979).

Genus *CICHLHERMINIA* Bonaparte, 1854

100. Forest Thrush

Cichlherminia lherminieri

French: Grive à pieds jaunes **German**: Antillendrossel **Spanish**: Zorzal Antillano
Other common names: Yellow-legged Thrush(!)

Taxonomy. *Turdus L'Herminieri* Lafresnaye, 1844, Guadeloupe.
Four subspecies recognized.
Subspecies and Distribution.
C. l. lawrencii Cory, 1891 – Montserrat.
C. l. lherminieri (Lafresnaye, 1844) – Guadeloupe.
C. l. dominicensis (Lawrence, 1880) – Dominica.
C. l. sanctaeluciae (P. L. Sclater, 1880) – St Lucia.
Descriptive notes. 25–30 cm; 100 g. Nominate race is warm brown above, including side of head (cheeks and ear-coverts with thin white lines), with broad yellow eyering and postocular flange; below, whitish with buff-bordered dark brown scalloping; iris yellow; bill and legs yellow. Sexes similar. Juvenile is slightly paler, with vague thin pale streaks above, more mottled effect below. Race *lawrencii* has rufous-edged throat feathers, and longer, more pointed white centres of breast feathers; *dominicensis* is smaller than nominate, darker above and on breast; *sanctaeluciae* is also smaller than nominate, paler above, spots on breast larger, buffish. Voice. Song, from concealed perch, a musical cadence of clear notes, fairly loud and far-carrying, resembling a melodious *T. migratorius*. Calls include sharp "chuk" or "chuk-chuk".



Habitat. All strata in moist mountain primary and secondary forest and edge, at middle and high elevations.
Food and Feeding. Insects and berries. Forages from ground to canopy. Formerly, when more numerous, gathered in large numbers in autumn to take berries on St Lucia.
Breeding. Apr–Jul. Nest a bulky cup made externally of moss, usually built close to ground in bush, tree-fern or tree. Eggs 2–3, greenish-blue. No other information.
Movements. Apparently sedentary; records of large numbers at fruiting trees on St Lucia suggest collective wandering outside breeding season.
Status and Conservation. VULNERABLE. Restricted-range species: present in the Lesser Antilles EBA. Total numbers considered greater than 10,000 mature individuals, but loss and degradation of habitat are chronic, and on Montserrat (the only island where ever judged reasonably common) have recently accelerated. Uncommon on Montserrat, Guadeloupe (no records from Grande Terre since 1993) and Dominica; rare on St Lucia. Has probably declined owing to habitat loss, competition from *Turdus nudigenis*, brood parasitism by Shiny Cowbird (*Molothrus bonariensis*), and human exploitation for food (still legally hunted on Guadeloupe, illegally so elsewhere, but once widely considered a delicacy); possibly also predation by introduced mongoose (*Herpestes*). Range on Montserrat was reduced by two-thirds following a series of volcanic eruptions, but population estimated to have recovered by 50% in two years from Dec 1997 to Dec 1999, to c. 3100 individuals. On Dominica, may have been affected by damage to canopy trees from hurricanes in 1979 and 1980, reducing area of open leaf litter. Occurs within Centre Hills Protected Area, on Montserrat; Morne Diablotin National Park, on Dominica; Guadeloupe National Park, on Guadeloupe; and, at least formerly, various forest reserves, including Edmond, on St Lucia, but no confirmed records on this island since 1980. New surveys needed, along with hunting bans and public-awareness campaigns.
Bibliography. Anon. (1998b), Arendt *et al.* (1999), Bond (1956b, 1979), Clement & Hathway (2000), Diamond (1973), Evans (1990), Keith (1997), Lack (1976), Raffaele *et al.* (1998), Stattersfield & Capper (2000).

Genus *ZOOTHERA* Vigors, 1832

101. Slaty-backed Thrush

Zoothera schistacea

French: Grive schistacée **German**: Weißohrdrossel **Spanish**: Zorzal Pizarroso

Taxonomy. *Geocichla schistacea* A. B. Meyer, 1884, Tanimbar.
Monotypic.
Distribution. Tanimbar Is (Larat, Yamdena).



Descriptive notes. 16–17 cm. Boldly but complexly marked black, white and grey thrush. Male has black forecrown merging to dark grey on nape, mantle, scapulars and back, also flight-feathers, with broad double white wingbar on black wing patch; long white supercilium and white cheek patch separated by black eyeline continuous with black chin to lower breast; white belly to undertail, with bold black spots on upper belly and greyish flanks; bill black; legs flesh-pink to yellowish. Female is similar, but less black on crown and fewer spots below. Juvenile undescribed. Voice. Song a series of phrases with variable intervals, each phrase an exquisite melody of 8 clear, sweet whistled notes (duration 3·4 seconds), first note drawn out and upslurred, then 6 short notes that alternate up and down scale, and a concluding long, upslurred high-pitched whistle. Calls include thin high "tsee" of variable length, apparently in alarm.
Habitat. Undergrowth and subcanopy of lowland forest.
Food and Feeding. Forages mainly on forest floor. Sometimes seen in small groups.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Banda Sea Islands EBA. Generally common. Significant logging activity in S Yamdena must be reducing habitat within its very small range.
Bibliography. Clement & Hathway (2000), Coates & Bishop (1997), Johnson & Stattersfield (1990), Stattersfield & Capper (2000), White & Bruce (1986).

102. Buru Thrush

Zoothera dumasi

French: Grive de Dumas **German**: Burudrossel **Spanish**: Zorzal de Buru
Other common names: Moluccan Thrush (when merged with *Z. joiceyi*)

On following pages: 103. Seram Thrush (*Zoothera joiceyi*); 104. Chestnut-capped Thrush (*Zoothera interpres*); 105. Enggano Thrush (*Zoothera leucolaema*); 106. Red-backed Thrush (*Zoothera erythronota*); 107. Red-and-black Thrush (*Zoothera mendeni*); 108. Chestnut-backed Thrush (*Zoothera dohertyi*); 109. Pied Thrush (*Zoothera wardii*); 110. Siberian Thrush (*Zoothera sibirica*); 111. Ashy Thrush (*Zoothera cinerea*); 112. Orange-banded Thrush (*Zoothera peronii*).

Taxonomy. *Geocichla dumasi* Rothschild, 1899, Mount Mada, 3000 feet [c. 915 m], Buru.
Closely related to *Z. joiceyi*; often regarded as conspecific, but considerable plumage differences. Monotypic.
Distribution. Buru, W of Seram.



Descriptive notes. 17 cm. Plumage is rich rufous-brown above, with incomplete pale eyering and whitish lores, darker wings with two broken (spotted) white wingbars, rusty-brown edges of flight-feathers, tail blackish with rufous-brown edging; black from face to mid-belly, breaking down into black spotting on white and then white from lower belly to (ochre-tinged) undertail-coverts; bill black; legs greyish-flesh to yellowish-brown. Sexes similar. Juvenile is as adult, but with pale shaft streaks and rufous-tinged wing-spotting above, buffy-white below, including vague submoustachial and throat, with irregular blackish, buff and rufous mottling across breast and on flanks. Voice. Song undocumented. Call a high "pthhhhhhh".
Habitat. Primary montane rainforest, at 700–1500 m; one sighting on moderately sloping ground.
Food and Feeding. No information.
Breeding. Eggs in early Feb and juveniles in Apr and May. Eggs very pale bluish with small reddish-brown spots. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened (this assessment made when *Z. joiceyi* was included as a race). Restricted-range species: present in Buru EBA. Described as not rare in 1922, and probably uncommon to locally moderately common. Montane forest on Buru relatively secure and intact.
Bibliography. Bowler & Taylor (1989), Clement & Hathway (2000), Coates & Bishop (1997), Collar (2004b), Siebers (1930), Stattersfield & Capper (2000), White & Bruce (1986).

103. Seram Thrush

Zoothera joiceyi

French: Grive de Céram **German**: Ceramdrossel **Spanish**: Zorzal de Seram
Other common names: Moluccan Thrush (when merged with *Z. dumasi*)

Taxonomy. *Turdus joicey* Rothschild and Hartert, 1921, high mountains of Seram.
Closely related to *Z. dumasi*; often regarded as conspecific, but considerable plumage differences. Suggestion of a supposed additional taxon on Seram erroneous, based on confusion over undertail-covert coloration. Monotypic.
Distribution. Lower mountain areas of Seram.



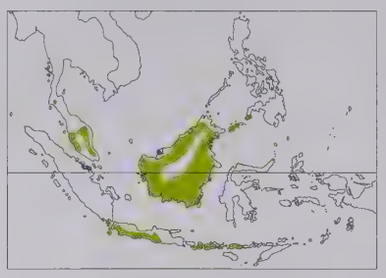
Descriptive notes. 17 cm. Rufous-brown crown shading to dull olive-brown on mantle and to sooty-greyish olive-brown from back to tail; darker wings with broken (spotted) white wingbar, perhaps often reduced to just a single spot; lores, eyering and ear-coverts black; underparts black with white scaling on upper belly giving way to whitish lower belly and undertail-coverts, flanks greyish-black; bill black; legs greyish-flesh to yellowish-brown. Voice. Song undescribed. Calls include very thin "tseep", audible at 50 m; flight or alarm call of flushed bird (assumed this species) a high-pitched "tsree-tsree".
Habitat. Montane rainforest, at 800–1280 m; recorded in flat areas of forest.
Food and Feeding. No information, except that birds observed on forest floor, whence flushed.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened (this assessment made when species treated as a race of *Z. dumasi*). Restricted-range species: present in Seram EBA. Appears to be much rarer than *Z. dumasi*, and its global conservation categorization may require upgrading, particularly in view of speculation that the species prefers, or is possibly confined to, those few areas of forest in Seram where level ground has allowed good leaf litter to accumulate. Against this, these areas lie within remote and relatively secure forest, and seven records of different individuals in five days, in Aug 1996, suggest a relatively healthy population in lower montane forest; moreover, recorded also from fairly high in Manusela National Park.
Bibliography. Bowler & Taylor (1993b), Clement & Hathway (2000), Coates & Bishop (1997), Collar (2004b), Isherwood *et al.* (1997), LeCroy (2003), Stattersfield & Capper (2000).

104. Chestnut-capped Thrush

Zoothera interpres

French: Grive de Kuhl **German**: Rostkappendrossel **Spanish**: Zorzal Coronicastaño

Taxonomy. *Turdus interpres* Temminck, 1828, Java and Sumatra.
Usually treated as conspecific with *Z. leucolaema*, but the two differ distinctly in plumage and moderately so in proportions. Monotypic.
Distribution. S Thailand and Peninsular Malaysia, Borneo, SW Philippines (Malamaui, Jolo and Tawi-Tawi, in Sulu Is), Java (including Krakatau, Deli, Tinjil) and Lesser Sundas (Lombok, Sumbawa, Flores).
Descriptive notes. 16–18 cm. Has dark chestnut crown and nape, shading to slaty blue-black upperparts with two very broad white wingbars (median coverts all white); whitish lores and incomplete eyering; black auriculars (enclosing white cheek patch) continuous with upper underbody, changing to black spotting on white belly and flanks, white lower belly to undertail-coverts, vague tinge of buff on lower flanks; some individuals (perhaps younger adults) show black-dappled white mesial stripe on throat; bill black; legs yellow to yellowish-pink. Sexes similar. Juvenile has chestnut of crown extending vaguely onto mantle and rump, with paler shaft streaks, chin to mid-belly rusty-buff with darker facial and throat stripes, irregular large black spots on breast and belly, dirty white below. Voice. Song (on Flores locally delivered from roofs of village houses and in middle storey of forest around villages, in Thailand from perch 2 m up in understorey) a series of phrases consisting of short rising fluty challenging whistles interspersed with chirrups and occasional harsh notes, phrases at intervals of 6–10 seconds; rich, recalling *Copsychus malabaricus* but with more high notes, sweet but not loud, "see-it-tu-tu-tyuu", rising on first 2 notes, then falling. Calls include harsh hard "tac", thin high falling "tsi-i-i-i" and harsh ringing "turrrr-turrrr".



Habitat. Lower to middle storey of primary, tall secondary and logged forest, woodland and woodlots; occasionally recorded in tree plantations (e.g. *Albizia*). To 760 m in SE Asia, but probably mainly in lowlands, at least in Thailand (breeding birds found at 80–200 m); in Borneo from sea-level to 400 m (record from 1300 m of apparently of dispersing individual); in Lesser Sundas recorded from lowlands to 1000 m, on Lombok to 1300 m. Thought to favour forest gulleys in Philippines.
Food and Feeding. Invertebrates, including earthworms, insects and snails, also fruit. Earthworms seen passed by male to presumed mate, and black seed 1 cm long seen regurgitated by fledgling. Forages both on ground and in trees, sometimes gathering in fruiting trees. Occasionally feeds in company with *Z. dohertyi* in canopy of fruiting trees.
Breeding. Jun–Jul (wet season) in Thailand, but fledgling in Dec; Apr and Sept in N Borneo, with breeding-condition birds May–Jun and juvenile Apr; Apr–May in C Java; breeding-condition birds Apr–May in Philippines. Cup-nest placed in one instance 1·6 m up in fork of slender sapling, another a cup of moss and bamboo leaves, lined with plant fibres, and placed 3 m up in *Schizostachyum zollingeri* bamboo, while others were in similar positions 2–4 m off ground. Eggs 2–3 (3–4 reported from Java), whitish to pale grey with heavy reddish-brown blotches. No other information.
Movements. Resident. Unclear dispersive pattern, has been suggested as nomadism; in Borneo, several records of individuals outside normal elevational range and habitat at night, Apr–May. Ability to move over water demonstrated by recent colonization of Krakatau. In Thailand, seemingly anomalous breeding late in year (in 1990) may be related to masting cycle of dipterocarps, individuals possibly moving into usually unoccupied areas in response to environmental changes.
Status and Conservation. Not globally threatened. Rare in Thailand and Philippines; scarce and local in Peninsular Malaysia. In Thailand, 11 territories dispersed over c. 4 km² of forest, and 3–4 singers also found in area of 3–4 ha (although they were evidently highly clumped). Only two records from Sumatra. In Borneo, fairly common in Sabah, but few recent records from all Kalimantan, where probably negatively affected by extensive replacement of lowland forest with oil palm and other plantations. Reported as locally fairly common in Lesser Sundas in mid-1990s; in late 1990s, however, inhabitants of a village on Sumbawa devoted themselves to the capture, to virtual extinction, of Lesser Sundas population of this species for trade, some being exported to Singapore. Recent colonization of Krakatau indicates resilience, but population there cannot be large.
Bibliography. Clement & Hathway (2000), Coates & Bishop (1997), Collar (2004b), Collar *et al.* (2001), Danielsen & Heegaard (1995), Dickinson *et al.* (1991), Glenister (1971), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Medway & Wells (1976), Robson (2000), Round & Treesucon (1997), Sheldon *et al.* (2001), Smythies (1999), Stattersfield & Capper (2000), White & Bruce (1986).

105. Enggano Thrush

Zoothera leucolaema

French: Grive d'Enggano **German**: Engganodrossel **Spanish**: Zorzal de Enggano

Taxonomy. *Geocichla leucolaema* Salvadori, 1892, Bua-Bua, Enggano Island.
Usually treated as conspecific with *Z. interpres*, but the two differ distinctly in plumage and moderately so in proportions. Monotypic.
Distribution. Enggano I, off SW Sumatra.



Descriptive notes. c. 16–18·5 cm. Crown to mantle rusty-ochre, mantle to rump olive-ochre, flight-feathers mid-brown, median wing-coverts slaty-brown with white tips; lores and face black, chin and throat white; black upper breast, giving way to black and white scaling on lower breast and flanks; white belly and undertail-coverts, dark rufous lower flanks; bill black; legs yellow or pale brownish-flesh. Juvenile is like adult, but more chestnut on crown and back, with pale shaft streaks, wing spots rusty-buff, underparts rusty-buff with rusty and blackish spotting forming partial breastband, centre of belly whitish. Voice. Song resembles a juvenile begging call.
Habitat. Rainforest.
Food and Feeding. No information.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Reportedly common within very restricted range, which supports relatively intact forest. Behaviour and ecology virtually unknown.
Bibliography. Clement & Hathway (2000), Collar (2004b), Junge (1938), van Marle & Voous (1988), Ripley (1944).

106. Red-backed Thrush

Zoothera erythronota

French: Grive à dos roux **German**: Rotrückendrossel **Spanish**: Zorzal Dorsirrojo
Other common names: Rusty-backed Thrush

Taxonomy. *Geocichla erythronota* P. L. Sclater, 1859, Makassar, north-west Sulawesi.
Formerly treated as conspecific with *Z. mendeni*. Two subspecies recognized.

Subspecies and Distribution.
Z. e. erythronota (P. L. Sclater, 1859) – Sulawesi (except E peninsula) and Buton I.
Z. e. kabaena Robinson-Dean *et al.*, 2002 – Kabaena I, SE Sulawesi.



Descriptive notes. 20 cm; 52–61 g. Nominate race has rufous or rufous-chestnut crown to rump, black wings with two broad white wingbars and white edges of flight-feathers, black tail with white tips of outer feathers; black supercilium; white lores and face, black subocular downward stripe connecting to black chin to mid-breast; broad white lower breast-band, whitish belly to flanks with broad black half-spots (looking like bars), white undertail-coverts; bill pale bluish-green; legs flesh. Sexes similar. Immature has pale buff streaks on scapulars, buffier face and throat, and rusty-buff wash on underparts. Race *kabaena* is black on crown to upper back (condition noted at least once in nominate). VOICE. Song apparently a liquid, typically thrush-like series of notes. Calls include single, very thin, very high-pitched upslurred whistle (on Kabaena, preceded by high and then low note), and harsh "chak-chak-chak-chak-chak" in alarm.
Habitat. Deep shade of tropical lowland and mid-elevation broadleaf evergreen forest, mainly primary, below 1000 m. On Kabaena, found in undisturbed closed-canopy secondary forest with largely clear ground, highly disturbed secondary forest by streams, secondary growth in ravines, cashew-nut plantations, bamboo stands and extensive areas of scrub, at 380–600 m.
Food and Feeding. Insects, including hymenopterans (almost entirely ants), heteropteran bugs, coleopterans and lepidopterans. Highly terrestrial, usually seen below 0·5 m, moving rapidly over the ground when foraging. On Kabaena, noted once following party of Sulawesi Babblers (*Trichastoma celebense*).
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Sulawesi EBA. Nominate race widespread on Sulawesi, but generally uncommon. Forest destruction within its elevational range has been extensive in recent decades, and the species may also have suffered from trade pressure; likely now to be encountered only towards upper reaches of elevational range. Race *kabaena* has tiny range and may be at elevated risk from fire, owing to extended dry season and widespread deforestation; nevertheless, it seems to tolerate wide range of highly degraded and modified wooded habitats.
Bibliography. Clement & Hathway (2000), Coates & Bishop (1997), Davidson et al. (1995), Robinson-Dean *et al.* (2002), Stattersfield & Capper (2000), Stresemann & Heinrich (1940), Watling (1983a), White & Bruce (1986).

107. **Red-and-black Thrush**

Zoothera mendeni

French: Grive de Menden **German**: Pelengdrossel **Spanish**: Zorzal de Peleng

Taxonomy. *Turdus* (*Geokichla*) *mendeni* Neumann, 1939, Peleng, Banggai Islands.
Formerly treated as conspecific with *Z. erythronota*. Population on Taliabu apparently represents an undescribed race, but details in need of clarification. Currently treated as monotypic.
Distribution. Peleng I, in Banggai Archipelago, and Taliabu, in Sula Archipelago.



Descriptive notes. 20 cm. Entire upperparts, including wings and tail, are rufous-cinnamon; face, including lores, black, white patches above eye and on ear-coverts, underparts black; bill slaty; legs pinkish-flesh. Birds of Taliabu have blackish wings and tail, black face with white postocular patch, chestnut undertail-coverts; more precise details of plumage and morphology require clarification. Sexes probably similar. Juvenile undescribed. VOICE. No information.
Habitat. Selectively logged forest (Taliabu).
Food and Feeding. Individual on Taliabu seen to feed on snail, first beating shell against bamboo stem.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Not assessed, as hitherto treated as a race of *Z. erythronota* (which currently considered Near-threatened). Restricted-range species: present in Banggai and Sula Islands EBA. Present species certainly merits re-evaluation; in view of very small range and apparent rarity, should probably be listed as, at least, Vulnerable. Known from Peleng on basis only of a single specimen, taken in 1938. A few sightings in 1991 on Taliabu, where habitat was then fairly extensive but secondary. Much further fieldwork required.
Bibliography. Clement & Hathway (2000), Collar (2004b), Davidson *et al.* (1995), Neumann (1939), Stones *et al.* (1997).

108. **Chestnut-backed Thrush**

Zoothera dohertyi

French: Grive de Doherty **German**: Sumbawadrossel **Spanish**: Zorzal de Doherty

Taxonomy. *Geocichla dohertyi* Hartert, 1896, Lombok (type) and Sumbawa, Lesser Sundas.
Monotypic.
Distribution. Lesser Sundas: Lombok, Sumbawa, Flores, Sumba and Timor.
Descriptive notes. 16–18 cm. Similar to *Z. erythronota*, but crown all blackish, face more extensively white; underparts different, with black of breast smudging with broad disorganized spots onto white central belly, and dull rust along breast side and flanks; bill blackish; legs whitish or flesh-pink. Sexes similar. Immature has chestnut streaks on crown and mantle, buffy-white face and throat, black breast spots on rusty-buff background, off-white lower underparts. VOICE. Song, usually from mid-canopy, a series of phrases separated by c. 1 second, each consisting of 3–7 clear sweet mellow whistles with more complex interwoven phrases. Calls include scratchy note, single flat whistle and very high squeaky whistle.



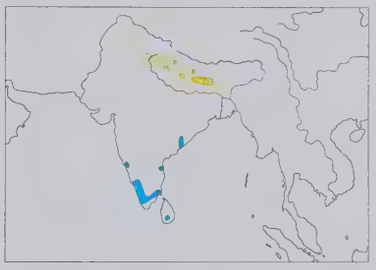
Habitat. Closed-canopy semi-evergreen lower montane and montane forest, occasionally penetrating degraded habitats such as village scrub adjacent to forest. Key habitat variables on Sumba include high tree density, tall trees, dense canopy cover and higher elevations, thus preferring high-altitude primary forest. Recorded at 460–1650 m on Lombok, 400–1700 m on Sumbawa, 350–1550 m on Flores, 200–1200 m on Sumba, and 1050–2300 m on W Timor.
Food and Feeding. Forages on ground, but also in trees, and most frequently observed in middle storey. Occasionally in groups of up to five in fruiting trees, when sometimes feeds in company with *Z. interpres*.
Breeding. Recently fledged birds late Jul to early Aug on Sumba, but singing also at that time, indicating extended season; juveniles on Sumbawa and Flores Aug–Sept. In captivity: 3 eggs, incubation period 15 days, nestling period 14 days.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Northern Nusa Tenggara EBA, Sumba EBA and Timor and Wetar EBA. At least formerly, locally common at 750–1000 m on Sumbawa and 750–950 m on Flores, and common above 500 m on Sumba. Density on Sumba estimated at 22·8 birds/km², yielding estimated total population size of 24,624, but with "likely true estimate" of 47,300. The species has, however, been traded in very high volume within Indonesia in recent years, such that it is probably already extinct on Lombok and close to extinction on Sumbawa. Moreover, apparent preference for lower elevations on Flores and Sumbawa renders main populations more vulnerable to deforestation and degradation. Conservation status perhaps merits re-assessment and upgrading.
Bibliography. Bralsford (2003), Butchart et al. (1996), Clement & Hathway (2000), Coates & Bishop (1997), Eck (1976), Jones et al. (1995), Stattersfield & Capper (2000), White & Bruce (1986).

109. **Pied Thrush**

Zoothera wardii

French: Grive de Ward **German**: Elsterdrossel **Spanish**: Zorzal de Ward
Other common names: Pied Blackbird/Ground-thrush, Ward's Thrush

Taxonomy. *T.(urdus) Wardii* Blyth, 1843, Mysore, India.
Monotypic.
Distribution. Himalayas of N India (Himachal) and Nepal; non-breeding S India and Sri Lanka.



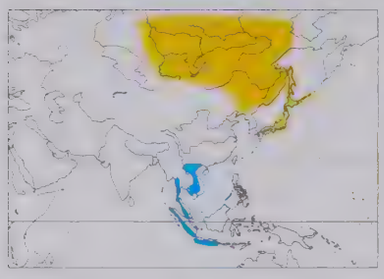
Descriptive notes. 18–20 cm; 52–72 g. Male is black above and to mid-breast, white from mid-breast to undertail-coverts, with black chevrons on flanks; white lores to supercilium, lesser and median wing-coverts, wingbar, and tips of flight-feathers and rump; bill and legs yellow. Female is greyish olive-brown above and on face, with buffy lores to supercilium and two spotted wingbars, brownish-olive malar dividing broad buffy-white, slightly scaled submoustachial and chin, shading to whitish and brown spotting and scaling below, with olive-brown wash on breast, white undertail-coverts; bill and legs dusky-yellowish. Immature is like female but darker; young male like adult but with whitish throat and breast spots. VOICE. Song a protracted unmusical sequence of spaced whistled phrases, each consisting of 2–4 short, sweet, high notes, last often a rattled "tsrrrii" or "tzit". Alarm call a spitting "ptz-ptz-ptz-ptz".
Habitat. Breeds in damp areas near water in open broadleaf forest, secondary areas and fragments, often close to rivers, at 1500–2400 m. Wintering in sholas (isolated forest patches in valleys), copses, jungly ravines, forest edge, coffee plantations, scrubland, parks and well-wooded gardens, at 750–1800 m.
Food and Feeding. Two species of beetle, a fly and a centipede found in one stomach. Partial to mulberries but also other fruit, including guava and wild fig. Forages in litter in undergrowth, turning over leaves; also in taller berry-bearing trees. Visits dungheaps in winter.
Breeding. May–Jul. Nest a compact cup of moss and dead leaves, braced with a little mud and lined with roots, placed up to 5 m from ground in fork of tall tree or low on stump. Eggs 4, pale sea-green with brownish-red markings and purple clouding. No other information.
Movements. Migratory. Winters mainly, possibly exclusively, in Sri Lanka, arriving Nov and departing end Mar or early Apr; recorded on passage in S India.
Status and Conservation. Not globally threatened. Formerly considered Near-threatened. Local and uncommon; sparsely distributed in breeding range. Reports of breeding E of known range, in Sikkim, Bhutan and NE India (Arunachal Pradesh, Assam), unconfirmed. Variable numbers in non-breeding season in Sri Lanka; annual fluctuations possibly due to the species using different sites in different years. At least in 19th century, sometimes caused damage to cultivated fruit crops in winter.
Bibliography. Ali & Ripley (1987b), Clement & Hathway (2000), Grimmett *et al.* (1998), Harrison (1999), Henry (1998b), Inskipp & Inskipp (1991), Karthikeyan (1994), Kazmierczak (1991), Legge (1983), Martens & Eck (1995), Rasmussen & Anderton (2005), Wunderlich (1988c).

110. **Siberian Thrush**

Zoothera sibirica

French: Grive de Sibérie **German**: Schieferdrossel **Spanish**: Zorzal Siberiano

Taxonomy. *Turdus sibiricus* Pallas, 1776, Siberia = Konda River, Transbaikalia.
Two subspecies recognized.
Subspecies and Distribution.
Z. s. sibirica (Pallas, 1776) – C & E Siberia S to N Mongolia, N Manchuria and Russian Far East; non-breeding SE Asia S to Greater Sundas.
Z. s. davisoni (Hume, 1877) – Sakhalin, S Kuril Is and Japan; non-breeding SE China S to S Sundaic region.



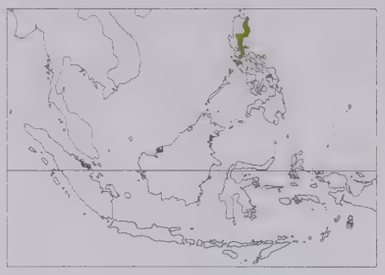
Descriptive notes. 20·5–23 cm; 60–72 g. Male nominate race is bluish-slaty, darker on face and shoulders, with long white supercilium, white belly, and white tips of undertail-coverts and outer tail; bill blackish; legs yellow. Female is olive-tinged mid-brown above, with mid-brown crown and wings, buffy-tipped wing-coverts, buff-and-brown face pattern, buff-and-brown scaling below, with white tips of undertail-coverts and outer tail. Immature male resembles adult male, but whitish on submoustachial and throat, pale buff tips of greater coverts, paler with whitish spotting below; immature female very like adult female, but wing spots stronger, face definition weaker, markings below heavier. Race *davisoni* is larger than nominate, male blacker, with vestigial white tips of undertail-coverts and tail, female darker olive-brown. Voice. Song, typically by male from high in tree, a prolonged series of spaced-out, languid, rich but also rather hesitant, short phrases, "tvee-tring tvee-tryu tvee-kvee tvee-kwi-tring yui'i-tss" and so on; race *davisoni* less musical, more squawky and abrupt, "feep-tss tweet-tss kleep-tsss". Calls include thin quiet "tsit" and "tsip" for contact, stronger "seep" or "tseee" when flushed and on migration, and soft dry rattling "chrssss" in alarm.
Habitat. Thick undergrowth of dense moist broadleaf evergreen and deciduous forest (including *Populus*), conifer forest (especially *Picea*) and mixed conifer–evergreen forest; prefers shady valley slopes, moist-bottomed floodplains and vicinity of water. In Japan breeds at 700–1800 m, occasionally up to tree-line. On passage in Thailand from sea-level to 2500 m. In China, migrants generally follow mountain ranges, with little use of lowland areas. In winter in montane forest in Vietnam, but often near human settlements and even in gardens.
Food and Feeding. Invertebrates, chiefly worms, and fruit, including fallen figs. Commonly terrestrial, but sometimes visits fruiting trees; usually in parties.
Breeding. May–Jul in China and Japan. Nest a cup of small twigs, tendrils and bark, lined with moss, leaves and rootlets, bound with some mud, placed above 1 m from ground (rarely higher than 4·5 m) in concealed position in small tree or crotch of shrub in undergrowth. Eggs 4–5 (3–4 in Japan), bluish with brown spotting; incubation period 11 days; no information available on nestling period.
Movements. Migratory. Departs from breeding areas early Sept to mid-Oct, with extensive passage through E China early Sept, but around Beidaihe (NE China) commoner in spring and very few records in autumn (mainly Sept); similar situation in N Korea, where records mid-Sept to late Oct. Scarce passage migrant and winter visitor in Hong Kong, commoner in autumn (late Sept to late Nov) than in spring (late Mar to late Apr), but this pattern reversed in 1995. Only on passage in Thailand, unless wintering in mountains in S. In Peninsular Malaysia a passage migrant and winter visitor mid-Oct to late Apr (autumn passage extending to early Dec). Regular in winter in Sumatra and W Java, but rare in Borneo and Bali. Occasional winterer in NE India. Spring return starts late Mar, with flocks of 60 in Apr in Myanmar; arrival in N Japan (race *davisoni*) late Apr to early May, but continuing passage through NE China and N Korea mid-Apr to late May, and arrival in Mongolia late May to early Jun. Vagrants recorded annually in Europe, rarely in small flocks.
Status and Conservation. Not globally threatened. Rare to locally abundant in Russia; fairly common in China. Locally common in Japan on Hokkaido and N & C Honshu; rare breeder in Kuril Is. Numbers in Japan severely reduced by trapping in first half of 20th century. Uncommon migrant in Thailand, but common in montane Peninsular Malaysia on passage and in winter.
Bibliography. Ali & Ripley (1987b), Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Beaman & Madge (1998), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), Cramp (1988), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dornberger & Barthel (1997), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Glenister (1971), Glutz von Blotzheim & Bauer (1988), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Herklots (1967), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Medway & Wells (1976), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986, 1999), Sowerby (1943), Stahl (2002), Tomek (2002), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

111. Ashy Thrush

Zoothera cinerea

French: Grive cendrée **German**: Mindorodrossel **Spanish**: Zorzal Cenizo

Taxonomy. *Geocichla cinerea* Bourns and Worcester, 1894, Mindoro, Philippines.
Monotypic.
Distribution. N & C Luzon and N Mindoro, in Philippines.
Descriptive notes. 18–20 cm. Plumage is dull slaty-grey above, with two white wingbars separated by black bases of greater wing-coverts; lores, moustachial area and auriculars white, black broad postocular bar and downward subocular stripe, narrow black submoustachial; dense black spotting on white underside, becoming much sparser on belly, undertail-coverts all white; bill darkish; legs dull yellowish. Sexes similar. Juvenile apparently undescribed. Voice. Song a series of wheezy, almost slurred notes spiralling upwards then downwards, "wheeezizizizizi zizizizizi".
Habitat. Primary forest, selectively logged and secondary forest, also forest with jagged limestone outcrops, remnant ridgetop patches, mossy forest and forest with open understorey dominated by



rattans. Recorded from near sea-level up to 1100 m, and up to 360 m on Mindoro; migrants up to 1560 m.
Food and Feeding. Insects and figs recorded in stomachs. Forages on forest floor, especially in open patches.
Breeding. Breeding-condition bird in Feb, two juveniles May, full-grown juvenile Oct and immature female Dec; season apparently roughly Feb–Aug. No other information.
Movements. Intra-island migrant on Luzon. Ringing studies at Dalton Pass (C Luzon) resulted in trapping of 130 birds, 1964–1970, presumably representing post-breeding dispersal or regular movement between Cordillera Central and Sierra Madre (or between areas N of the pass and those S of it) in response to differing rainfall regimes.
Status and Conservation. VULNERABLE. Restricted-range species: present in Mindoro EBA and Luzon EBA. Population judged to be larger than 10,000 mature individuals, but declining rapidly after extensive deforestation in the recent past; further habitat loss is expected, owing to known logging concessions and road-building plans, in near future. Species generally considered uncommon, although its reclusive behaviour may mask its true abundance; total of 130 individuals ringed over seven years at Dalton Pass (Luzon) suggests higher numbers than has otherwise been imagined, but this site is a migration bottleneck. In a recent review, 25 localities mapped, of which only 15 are known to involve post-1980 records. Trapping of migrant birds at Dalton Pass for food and as pets may also adversely affect population; a new study of the situation there is called for, with appropriate controls to be implemented depending on findings. Recent conservation initiatives in Sierra Madre have resulted in formal protection for extensive areas of forest where the species is known to occur, including Northern Sierra Madre Natural Park. Also present in Quezon National Park, which suffers from illegal logging, and occurs (at least seasonally) in Mount Makiling National Park.
Bibliography. Amadon & duPont (1970), Clement & Hathway (2000), Collar, Andreev *et al.* (2001), Collar, Mallari & Tabaranza (1999), Danielsen *et al.* (1994), Dickinson *et al.* (1991), Dutson *et al.* (1992), Evans, Dutson & Brooks (1993), Gonzalez (1993), Hachisuka (1938), Kennedy *et al.* (2000), McClure & Leelavit (1972), McGregor (1905, 1909–1910), Poulsen (1995), Stattersfield & Capper (2000).

112. Orange-banded Thrush

Zoothera peronii

French: Grive de Péron **German**: Timordrossel **Spanish**: Zorzal de Timor
Other common names: Orange-sided Thrush

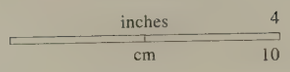
Taxonomy. *Turdus peronii* Vieillot, 1818, New Holland; error = Kupang, Timor.
Two subspecies recognized.
Subspecies and Distribution.
Z. p. peronii (Vieillot, 1818) – Roti and W Timor.
Z. p. audacis (Hartert, 1899) – Timor Leste (E Timor), and Wetar and Romang E to Babar.



Descriptive notes. 19·5–21·5 cm. Nominate race is deep orange-brown above, connecting to orange-chestnut below on breast and flanks, with white face to upper breast and white belly to undertail-coverts; broad black postocular bar and downward subocular stripe, vague orange-brown submoustachial, white lesser and median wing-coverts and tips of greater coverts, blackish flight-feathers with white outer edges of primaries; bill brownish-black; legs lavender-grey to pale brownish-flesh. Sexes similar. Juvenile has pale shaft streaks and rusty-edged wing spots above, breastband of blackish-and-buff mottling, blackish-spotted rusty flanks. Race *audacis* is darker above and below than nominate. Voice. Song, in most months of year, a series of phrases each consisting of three loud, ringing, upslurred whistles followed by a variable set of shorter staccato or chattering notes.
Habitat. Forest, including monsoon forest, favouring areas with closed canopy, although present in degraded patches. Lowlands to 1200 m.
Food and Feeding. Forages at various levels, on ground, in middle storey and in canopy. Occasionally encountered in groups of up to five individuals in fruiting trees.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Timor and Wetar EBA and Banda Sea Islands EBA. Generally common, but areas of closed-canopy forest are forever diminishing within its range. Moreover, it is feared that trade in this fine songster will increase as numbers of other Lesser Sundaic thrushes are depleted to extinction or near-extinction by trappers.
Bibliography. Clement & Hathway (2000), Coates & Bishop (1997), Johnson & Stattersfield (1990), Johnstone & Jepson (1996), Stattersfield & Capper (2000), White & Bruce (1986).

PLATE 62 ➤

PLATE 62


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cm
10

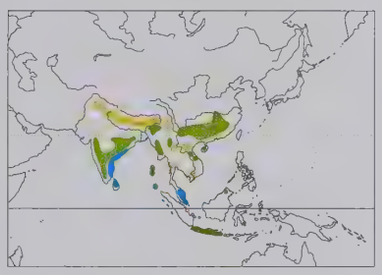
♂
ssp cyanota
♂
ssp melli
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ssp citrina ♀
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♂
ssp rubecula
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115
ssp tanganjicae
ssp piaggiae
ssp pilettei
116
ssp crossleyi
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118
ssp camaronensis
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ssp graueri
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ssp guttata
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ssp lippensi
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113. Orange-headed Thrush

Zoothera citrina

French: Grive à tête orange **German**: Damadrossel **Spanish**: Zorzal Citrino
Other common names: Orange-headed Ground Thrush; White-throated Thrush (*andamanensis*, *albogularis*)

Taxonomy. *Turdus citrinus* Latham, 1790, Cachar, India.
Geographical variation difficult to interpret, as both migratory and resident populations occur. Strong contrast in India between nominate race and *cyanota* suggests separate species, but overlap and "leapfrog pattern" of key characters between races renders new arrangement problematic; dark-barred face pattern of some races appears to be present in all juvenile plumages. Proposed race *orientis* (from E Java) based on longer wing, but not considered distinct from *rubecula*; putative race *amadoni* (from Chanda, in C India) appears indistinguishable from *cyanota*. Eleven subspecies recognized.
Subspecies and Distribution.
Z. c. citrina (Latham, 1790) – Himalayas E to NE India and W & N Myanmar; non-breeding S India and Sri Lanka.
Z. c. cyanota (Jardine & Selby, 1828) – C & S India.
Z. c. gibsonhilli (Deignan, 1950) – C & SE Myanmar, SW Thailand; non-breeding Peninsular Malaysia and Singapore.
Z. c. innotata (Blyth, 1846) – S China (S Yunnan), E Myanmar, N & SE Thailand, NW & S Indochina; non-breeding Peninsular Malaysia.
Z. c. melli (Stresemann, 1923) – S China.
Z. c. courtoisi (Hartert, 1919) – Anhui (E China).
Z. c. aurimacula (Hartert, 1910) – C Indochina and Hainan I.
Z. c. andamanensis (Walden, 1874) – Andaman Is.
Z. c. albogularis (Blyth, 1847) – Nicobar Is.
Z. c. aurata (Sharpe, 1888) – N Borneo (Mt Kinabalu and Mt Trus Madi, Crocker Range).
Z. c. rubecula (Gould, 1836) – Java and Bali.



Descriptive notes. 20–23 cm; 47–67 g. Shy, crepuscular. Male nominate race is dull pale orange with vaguely mottled matt and glossy grey mantle to wings and tail (glossy parts appearing dark at certain angles); white median wing-coverts, white lower belly to undertail-coverts; bill blackish, paler base; legs dull flesh. Female is similar, but slaty-grey of mantle and back replaced by dull matt and glossy greenish-brown, wings and tail also brown. Juvenile is dull orange-brown from head to mantle with vague buff flecking, dark facial bars (as in adult *cyanota*), buff-tinged double wingbar, dull brownish with dull buff-orange flecking and spotting below, most intense around breast, plain chin and throat; underparts quickly assume adult orange, with browner breast and buffier throat. Race *gibsonhilli* is slightly brighter and heavier-billed than nominate; *innotata* is richer orange, no white wingbar; *cyanota* is like nominate, but has white face with broad olive-brown vertical subocular stripe ("running mascara") and parallel broad auricular stripe, narrow orange malar stripe, white chin to upper breast; *melli* has face pattern as previous, but face and throat pale buffy-orange (not white); *courtoisi* resembles last, but larger and longer-winged; *aurimacula* is very like previous, perhaps slightly smaller; *andamanensis* resembles nominate, but more whitish throat, sometimes traces of face bars, lacks white wingbar; *albogularis* is very like previous, but slightly more clear-cut white throat and more intense orange; *aurata* has head to breast slightly deeper orange than nominate, juvenile and immature much darker overall than equivalents; *rubecula* is like nominate but much richer, darker and uniform orange on head and underparts, with clear-cut white lower belly to vent. Voice. Song (nominate) loud, rich, melodious, varied series of short, cohesive phrases involving slurred notes and rich trills, with some mimicry of wide range of species, including Common Hawk-cuckoo (*Cuculus varius*), "wheeur-tee-lee wheeper-pree-pree-pelee, wheeper, pree-pree-pelee rhi-ti-li-tili-wheeper-wo-wheeper-wo kwir-loo-twi-lili, kwir-loo-twi-lili"; race *innotata* has a sweet rich series, "wiipa-prii-priitiilii wiiuu-piiirpa-wiichii-liit-wiiichii-liit pir-wuu-piirrte"; *cyanota* also very musical and rich, but shriller, rollicking. Calls include thin "tzzeet", subdued "tjuck", and shrill screeching "kreeee" or "teer-teer-teerrr" in alarm.
Habitat. Understorey of moist deciduous forest and evergreen forest, mixed secondary and bamboo thickets, plantations and shady village groves, often or mainly near running water and in lower-elevation ravines, reaching 2300 m in Himalayas. Race *cyanota* favours overgrown ravines and nullahs, *aurimacula* thick montane forest. In Thailand to 1500 m. In Borneo bamboo possibly preferred; range 900–1800 m, with one lowland record (possibly of migrant or vagrant).
Food and Feeding. Insects (including termites), earthworms, leeches, slugs, snails, berries, fruit, grass seed; especially figs in winter in Peninsular Malaysia. Rummages quietly for food among leaf litter under shrubbery and dense undergrowth, mainly gleaning from substrate, actively tossing leaves aside; also probing in earth and in mossy crevices between stones. Takes fruit from high in trees.
Breeding. Breeds Apr–Jun (seemingly also Jul–Aug) in Himalayas, May–Sept elsewhere in India; generally May–Oct in SE Asia but May–Jun in Myanmar; fledged young in May and breeding-condition female in Nov in Borneo. Nest a shallow thick cup of stems, soft bark, roots and green moss mixed with mud, lined with moss, fern roots and fibres, placed 1–5 m up in bush, bamboo or tree at forest edge; nest bottom often has long dangling strands of material. Eggs 3–4, exceptionally 2 or 5, glossy bluish-white, greenish-white or creamy-white to pale olive and stone-grey, blotched and freckled pale reddish-brown; incubation period 13–14 days; nestling period 12 days. Occasionally parasitized by Jacobin Cuckoo (*Clamator jacobinus*).
Movements. Nominate race migratory except in S Assam hills, wintering over Indian Peninsula; passes through Pt Calimere (Tamil Nadu) in Oct, apparently en route to Sri Lanka (where small numbers regular); leaves Pakistan early Oct, returning May. Resident elsewhere in Indian Subcontinent, but moves locally, particularly during monsoon. Races in China mostly undertake some migration, but poorly understood: *melli* reportedly a migrant through Guizhou, Guangxi and Guangdong, and *courtoisi* a summer visitor to Anhui; minor passage in Hong Kong, Oct and Mar–Apr. Resident in parts of SE Asia, but breeding visitor N Myanmar and N Thailand, and winter visitor parts of Thailand, Peninsular Malaysia, S Vietnam and (few records) Sumatra. In Peninsular Malaysia, two races (*innotata* and *gibsonhilli*) represented in winter, with passage or arrival late Nov to late Dec and early to mid-Apr. Indochinese populations undertake vertical movements in winter, but essentially resident.
Status and Conservation. Not globally threatened. Very local and scarce in Pakistan, breeds only in Margalla Hills. Uncommon to rare in China, including Hainan. Fairly scarce resident throughout foothills and higher ranges in Myanmar, and uncommon both as resident and winter visitor in Thailand. Uncommon to rare resident in N Borneo. Has declined greatly in Java as a result of trapping for the cagebird trade.
Bibliography. Ali (1977, 1996), Ali & Ripley (1987b), Banerjee (1980), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), David & Gosselin (2002a), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Futehally (1964), Glenister (1971), Grimmett *et al.* (1998), Harrison (1999), Henry (1998b), Herklots (1967), Inglis (1899), Inskipp & Inskipp (1991), Jayawardene (1979), Jeyarajasingam & Pearson (1999), Kannan (1998), Kinloch (1922b), Legge (1983), Lekagul & Round (1991), Lewis & Inglis (1944), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Medway & Wells (1976), Mees (1996), Meyer de Schauensee (1984), Panday (1980), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Sheldon *et al.* (2001), Smythies (1986, 1999), Wildash (1968), Zheng Guangmei & Zhang Cizu (2002).

114. Everett's Thrush

Zoothera everetti

French: Grive d'Everett **German**: Everettdrossel **Spanish**: Zorzal de Everett

Taxonomy. *Geocichla everetti* Sharpe, 1892, Mount Dulit, north-west Borneo.
Monotypic.
Distribution. N Borneo (Sabah and NE Sarawak).



Descriptive notes. 19–20 cm. Plumage is deep olive-brown above, with vague olive tinge on neck side and rump; pale buff-white lores, submoustachial and chin to throat, dark brown malar, and buff-flecked ear-coverts; orange-chestnut below, becoming white on lower belly and pale orange on vent and undertail-coverts; bill dark; legs dull flesh to brownish. Sexes similar. Juvenile has orange-buff tips on wing-coverts, brown scaling on orange-buff underparts. Voice. Song apparently undescribed; subsong a very subdued scatter of musical notes. Call a sharp "tsak! tsak! tsak!" in alarm, and a quiet clicking or muttering noise in flight.
Habitat. Mossy montane forest, at 1200–2140 m. One observation in "jungle dense with creepers" and others along trails in stunted dense growth.
Food and Feeding. Small insects, including beetle larvae and termites; also worms, leeches. Forages singly or in small groups on ground amid damp leaves or in low vegetation.
Breeding. Nest found in May, placed low in undergrowth. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in the Bornean Mountains EBA. Highly secretive and very poorly known species; possibly genuinely rare, and probably declining through deforestation at lower elevations in its range. Known from only six montane areas: mountains of Kinabalu, Murud, Mulu, Dulit, Trus Madi and the Kelabit Uplands. Protected in Sabah under the Wildlife Conservation Enactment.
Bibliography. Clement & Hathway (2000), Davison (1992), Johnson & Stattersfield (1990), MacKinnon & Phillipps (1993), Sheldon *et al.* (2001), Smythies (1999), Stattersfield & Capper (2000).

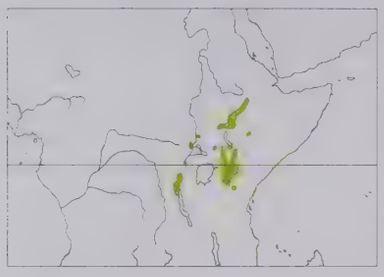
115. Abyssinian Ground-thrush

Zoothera piaggiae

French: Grive de Piaggia **German**: Orangedrossel **Spanish**: Zorzal Abisinio
Other common names: Kivu Ground-thrush (*tanganjicae*)

Taxonomy. *Turdus piaggiae* Bouvier, 1877, Uganda (M'Tésa's country) = Lake Tana, northern Ethiopia.
Status of races uncertain and greatly in need of clarification. Considerable individual variation throughout range, and greater sampling may reveal that several races are invalid; in addition, morphological differences appear to exist between populations at different elevations, raising possibility that several species (with relatively subtle plumage differences, but presumably rather more distinctive vocalizations) are involved. Race *tanganjicae* often treated as a separate species, and has been suggested as exhibiting some vocal differences from others. Traditional arrangement followed in list below, but should be regarded as provisional. Six subspecies recognized.
Subspecies and Distribution.
Z. p. hadii (Macdonald, 1940) – S Sudan (Imatong and Dongotona Mts).
Z. p. piaggiae (Bouvier, 1877) – SE Sudan (Boma Hills) and Ethiopia S to E DRCongo and N & W Kenya.
Z. p. ruwenzorii Prigogine, 1985 – Ruwenzori Mts (W Uganda).
Z. p. tanganjicae (Sassi, 1914) – E DRCongo, SW Uganda, Rwanda and N Burundi.
Z. p. kilimensis (Neumann, 1900) – C & S Kenya and N Tanzania.
Z. p. rowei (C. H. B. Grant & Mackworth-Praed, 1937) – N Tanzania.
Descriptive notes. 19–20 cm; 43–65 g. Nominate race is pale olive-brown from cheeks to hindcrown and upperparts, with darker wing-coverts, double white-spotted wingbars; dull rufous forehead and underparts, shading to whitish belly to undertail-coverts; white eyering; bill dark; legs flesh. Sexes similar. Juvenile is buff-streaked brown above, orange-buff with blackish scaling below, wingbars as adult, face with vague dark subocular smudge and blackish malar. Racial variation slight: *hadii* is

On following pages: 116. Crossley's Ground-thrush (*Zoothera crossleyi*); 117. Orange Ground-thrush (*Zoothera gurneyi*); 118. Oberländer's Ground-thrush (*Zoothera oberlaenderi*); 119. Black-eared Ground-thrush (*Zoothera camaronensis*); 120. Grey Ground-thrush (*Zoothera princei*); 121. Spotted Ground-thrush (*Zoothera guttata*); 122. Spot-winged Thrush (*Zoothera spiloptera*); 123. Sunda Thrush (*Zoothera andromedae*); 124. Plain-backed Thrush (*Zoothera mollissima*); 125. Long-tailed Thrush (*Zoothera dixoni*).



more brownish-olive above; *kilimensis* resembles previous, but deeper orange; *rowei* is like last, but more olive above, and paler orange; *ruwenzorii* is slightly larger than nominate, with more extensive rufous on crown, darker and more extensive orange below; *tanganjicae* has entire crown deep brownish-rufous, with brighter russet on rump, female slightly duller. Voice. Song, typically from low concealed perch in deep twilight, a series of well-spaced, tuneful phrases consisting of 3–12 whistled notes, usually (not always) each phrase repeated 2–4 times with minor variations, but each differing consideraby from preceding one, "wurr tiiu wiiu wur-wiiu-tiwii, (wichu-tsik) trrrrwiiiu, siisurrwiii, tiuwii (chikuchik) wurwiiiotuwiiii" and so on, similar to that of *Z. gurneyi* but richer and flutier; race *tanganjicae* slower, longer and more rambling. Call in alarm a shrill musical rattle or a high, thin "seep".

Habitat. Primary montane forest, normally at 2000–3000 m, but 1700–3600 m on Mt Kilimanjaro (Tanzania), to 3300 m on Mt Kenya, above 2130 m in S Sudan and, on smaller isolated mountains, generally lower (e.g. 1310–1560 m on Mt Marsabit, 1800–1860 m on Mt Kulal). Race *tanganjicae* reportedly occurs in lower montane forests at 1530–2040 m, with specimens from 2900 m and 2325 m, but in Nyungwe Forest (Rwanda) at 1750–2700 m. Found in range of forest conditions, from tall closed-canopy forest with open floor and extensive middle stratum to short, open-canopy woodland with extensive undergrowth and tracts of short grass; tends to avoid secondary and logged forest, and rare or exceptional in exotic conifer plantations. At higher elevations occupies mixed forest, bamboo, and moorland copses of *Hagenia*, *Erica* and *Philippia*; at lower ones in lush undergrowth with tree-ferns, balsams and brambles (*Rubus*). In Ethiopia found in olive–juniper–*Podocarpus* forest. Particularly favours bamboo zone on Mt Kenya. On Kilimanjaro, occurs especially where forest floor densely covered with moss and lichen.

Food and Feeding. Invertebrates and fruit. Diet includes insects and their eggs and larvae (grasshoppers, beetles, caterpillars, hymenopterans), earthworms, snails, other small molluscs, and millipedes; also berries, small fruits (including *Pauridintha paucinervis*), fruit pulp and seeds. Forages on ground among moss, lichen and leaf litter, usually in deep cover; at dusk, also on short-grass tracks in semi-open for worms; follows ant swarms. Seasonally, takes fruits in low bushes and trees, associating with bulbuls (Pycnonotidae).

Breeding. Mainly during rains: Feb–May and Sept in Ethiopia, May in Sudan; Apr and Oct in DRCongo, Apr–Jun and Oct–Jan in Rwanda, and Mar, Jul and Nov in Uganda; Mar–Jun and probably Nov–Dec in Kenya. Nest a cup of moss, lined with fern stems and rootlets, placed 1·5–5 m up in tree amid dense foliage or on mossy branch. Eggs 2, pale greenish-blue to bluish-green with chestnut to maroon spots and blotches. No other information.

Movements. Resident, with limited altitudinal movements; suggested that race *tanganjicae* moves from Bwindi Forest (down to 1600 m) to higher altitude (2500 m or higher) when not breeding.

Status and Conservation. Not globally threatened. Scarce to locally common; uncommon in Sudan. In Kenya, density in primary forest 0·6 birds/ha, in coniferous plantations 0·07 birds/ha. Race *tanganjicae*, when accorded species status, is considered Near-threatened; known from at least ten forest blocks, three of which are national parks, and lie within the Albertine Rift Mountains EBA; closed forest apparently optimum habitat for this race, which occurs at densities there of 0·4 pairs/ha. Race *rowei* of N Tanzania little known; observation in 1993 was apparently first since it was initially described, in 1931.

Bibliography. Benson (1946a), Britton (1980), Brown & Britton (1980), Carlson (1986), Cave & MacDonald (1955), Chapin (1953), Clement (1999b), Clement & Hathway (2000), Cordeiro (1994a), Demey (1999), Dowsett (1990), Keith & Twomey (1968), Lippens & Wille (1976), Moreau & Sclater (1935), Nikolaus (1987), Prigogine (1971, 1977, 1984b, 1985), Salempo (1994), Sinclair & Ryan (2003), van Someren & van Someren (1949), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Taylor & Taylor (1988), Urban *et al.* (1997), Zimmerman *et al.* (1996).

116. Crossley's Ground-thrush

Zoothera crossleyi

French: Grive de Crossley **German**: Crossleydrossel **Spanish**: Zorzal de Crossley

Taxonomy. *Turdus crossleyi* Sharpe, 1871, Cameroon Mountain Cameroon.

Frequently treated as a well-marked race of *Z. gurneyi*, in part owing to vocal similarity, but plumage differences militate in favour of full species status. Two subspecies recognized.

Subspecies and Distribution.

Z. c. crossleyi (Sharpe, 1871) – SE Nigeria, Cameroon and S PRCongo.

Z. c. pilettei (Schouteden, 1918) – NE DRCongo.



Descriptive notes. 21·5 cm; 63–82 g. Nominate race is pale olive-brown on crown, hindneck and rest of upperparts, brighter on upper lores and rump; much darker wing-coverts, with two white-blotched wingbars, outer tail with buffish tips; face smudgily blackish, with white half-eyering, and black-stippled chin; dull rufous underparts, shading to whitish from belly to undertail-coverts; bill blackish; legs whitish-flesh to pinkish. Sexes similar. Juvenile is like adult above with buffish shaft streaks, below rufous-buff with blackish throat, dark markings on breast and flanks. Race *pilettei* has more olive crown, mantle, rump and tail, latter with whitish tips. Voice. Song, sometimes from ground, a series of phrases consisting of 7–10 rich mellow whistles rising up scale, "hor-her-hiiwo-chichiwo-tsitsi", each phrase like preceding one but subtly varied. Calls include thin high "siiip" in alarm.

Habitat. Mid-elevation primary montane forest, at 1000–2300 m in Cameroon (seasonal records lower), 500–600 m in PRCongo, 960–1850 m in DRCongo. Occupies wetter parts of forest, favouring sites near water, including ravines, and keeps to understorey and ground.

Food and Feeding. Mainly insects; some seeds. Forages on ground in deep cover.

Breeding. Breeding-condition birds Apr–Jun in Nigeria, Apr, Jun and Aug in Cameroon and Aug–Nov in DRCongo, all of which suggests breeding in rains. No further information.

Movements. Individual in Cameroon trapped at 650 m in Dec and retrapped at 200 m in Jan, indicating vertical migration, but extent of phenomenon unknown.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Rare to locally fairly common. Generally rare but widely distributed in Cameroon; fairly common to very common in N Bakossi Mountains in 1998 and on Mt Nlonako in 1999, and with range extension to Mt Manenguba in 1999. Susceptible to forest loss within relatively small and increasingly fragmented range. Race *pilettei* very locally distributed, notably in a small patch of forest currently being encroached upon by banana plantations.

Bibliography. Ash & Gullick (1989), Bannerman (1953), Borrow & Demey (2001), Chapin (1953), Clement (1999b), Clement & Hathway (2000), Dowsett & Dowsett-Lemaire (1993), Elgood *et al.* (1994), Lippens & Wille (1976), Plumptre & Mutungire (1996), Prigogine (1965, 1980b, 1985), Serle (1950b, 1954), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stuart (1986), Stuart & Jensen (1986), Urban *et al.* (1997), White (1967).

117. Orange Ground-thrush

Zoothera gurneyi

French: Grive de Gurney **German**: Gurneydrossel **Spanish**: Zorzal de Gurney
Other common names: Gurney's Thrush/Ground-thrush

Taxonomy. *Turdus gurneyi* Hartlaub, 1864, near Pietermaritzburg, Natal, South Africa.

Frequently treated as conspecific with *Z. crossleyi*, in part owing to vocal similarity, but plumage differences favour treatment as two separate species. Proposed races *chyulu* (from Chyulu Mts, in SE Kenya) and *usambarae* (from Mlalo, near Wilhelmstal, in N Tanzania) considered synonyms of *raineyi*. Five subspecies recognized.

Subspecies and Distribution.

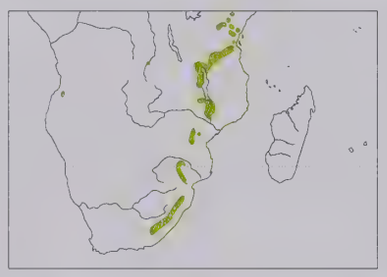
Z. g. chuka (van Someren, 1931) – Mt Kenya and Kikuyu escarpment.

Z. g. raineyi (Mearns, 1913) – SE Kenya and N Tanzania.

Z. g. otomitra (Reichenow, 1904) – W Angola, SE DRCongo, Tanzania and N Malawi.

Z. g. disruptans (Clancey, 1955) – C Malawi S to Mozambique, E Zimbabwe, NE South Africa (Northern Province) and N Swaziland.

Z. g. gurneyi (Hartlaub, 1864) – E South Africa (KwaZulu-Natal S to Eastern Cape).



Descriptive notes. 18–23 cm; 44–82 g. Nominate race is very like *Z. piaggiae*, including double white-spotted wingbars, but solid olive-brown from forehead to tail, with interrupted white eyering, smudged brown subocular vertical stripe on grey-brown cheek and rear of ear-coverts, rufous-orange lores and underparts, with white mid-belly to undertail-coverts; bill dark; legs pale flesh. Sexes similar. Juvenile is mid-brown with buff streaks above, russet-brown with dark scaling below, face pattern and wingbars much as adult but buffier. Racial variation slight: *chuka* is slightly larger, longer-billed and darker above, with greyer head; *raineyi* is like nominate but paler above and on ear-coverts, heavier subocular smudge; *otomitra* resembles previous, but slightly paler grey on crown and ear-coverts; *disruptans* is slightly smaller than nominate, with upperparts olive-brownish except for russet-tinged rump. Voice. Song (Kenya) varies from short, simple series of unrepeated phrases, "tu turii kiiu-turl" or "wurii tu-tu", to a series of very variable phrases of 5–18 rich fluting whistles, each phrase repeated 3–5 times before new one adopted, and usually finished with barely audible high "riii-iii turiii-tu, riii-iii turiii-tu, erriii tu-tu riiii, erriii tu-tu riiii"; mellower and slower than song of *Z. piaggiae*, but in S of range (nominate, *disruptans*) more rambling, repetitive song recalling that of *Erythropygia signata* and often given at dusk. Call is a hissing trill, "tsirrt" or "querk", a chuckling "curiik" or low "tseek" when flushed, buzzy "bzie-e-e-e-ie" when food-carrying; at dusk, gives a brief "ti-tue-tue-tuu-wii-to".

Habitat. Primary montane forest, even very small patches, generally avoiding second growth, edge habitats and exotic plantations where soils relatively dry; in South Africa mainly *Podocarpus* forests in mist belt, where favours moister parts near streams, often on steep slopes in deep, narrow kloofs, especially where relative open understorey and a carpet of dead leaves. Exceptional in riverine forest and streamside scrub. In Chyulu Hills, in Kenya, found in damp undergrowth, especially around *Connophyringia* trees, and in general requires thick leaf litter. Keeps mainly to ground and understorey. Altitudinal range variable: 1830–2300 m in C Kenya, but 1370–2140 m in Chyulu Hills; 1600–2500 m in Tanzania, but to 1900 m in Udzungwas, 1500–2000 m in North Pares and Ulugurus, 900–1200 in E Usambaras, down to 920 m on Ngurus, up to 2400 m on Mt Meru; in Malawi, 1450–2350 m in N and 1200–2200 m in S; 1590–2140 m in Zimbabwe, but below 1220 m in S; 1250–1750 m in SE DRCongo; 1800–2400 m on Mt Moco, in Angola; 500–1980 m in South Africa. On Mt Kenya, occurs mainly in wetter forest below 2000 m, being replaced by *Z. piaggiae* above 2300 m in drier areas.

Food and Feeding. Invertebrates and vegetable matter; some vertebrates. Chiefly earthworms, but also millipedes, molluscs, woodlice, insects (including beetles, crickets, flies and larvae), and small amphibians; berries, seeds, fruit, including fallen fruits such as figs. Takes larvae of flies in fallen fruit of *Connophyringia* trees. Vegetable matter accounts for 20% of diet in Kenya, but rare in diet in South Africa. Occasionally follows ant swarms, and associates with mole-rats (*Cryptomys*), which also flush litter-dwelling invertebrates. Forages on ground, scratching leaves with feet and tossing them with bill; investigates rotting logs. Partly crepuscular. Dominated by larger *Turdus olivaceus* in aggressive encounters when foraging.

Breeding. Jan and May in Kenya, Aug and Dec in Tanzania, Oct–Jan in Malawi, Nov–Dec in Mozambique and Sept-Jan (peak Dec) in Zimbabwe; in South Africa, Oct–Nov in N and Oct–Jan in KwaZulu-Natal; approaching breeding condition Sept in Angola. Nest a bulky cup of twigs, roots, leaves, fern fronds and especially dead and green moss (sometimes growing moss incorporated), lined with rootlets, moss, etc., placed 0·3–4 m up (usually below 2 m), most often in sapling, or on stump, in fold in trunk, in vine tangle, tree-fern crown, bush or mossy bank, sometimes near footpath or over stream; often conspicuous. Eggs 1–3 (usually 2), turquoise or blue with reddish to brownish spots and lilac blotches; incubation period 15 days; nestling period 14–19 days; post-fledging dependence several months. In sample of 12 eggs (in six clutches), fledging success 25%; may lay up to three replacements. Adult survival rate over two years was 86%.

Movements. Mainly sedentary, but partial altitudinal migrant. Very occasionally recorded on Kenyan and (once) Tanzanian coast, and at unusually low elevations in Zimbabwe (e.g. Haroni-Rusitu, 350 m, May–Jul), Malawi (Jun–Jul) and Mozambique; records at 260–280 m on Mrima Hill, in Kenya, 450 m in E Usambaras, in Tanzania, and 550 m at Yembe Hill, in Malawi. Wet-season records from coastal forest in Tanzania, however, suggest possibility of small resident populations at low altitudes. Nominate race and *disruptans* probably move altitudinally in S Africa, where former occurs in Eastern Cape coastal forests during winter.

Status and Conservation. Not globally threatened. Scarce to locally common. Classified as "Near-threatened" in South Africa; no evidence of decline during 1970s–1990s, but dependent on forest protection. Densities 46 pairs (or 138 individuals)/km² in Udzungwa Mts (Tanzania), 20–50 pairs/km² on Nyika Plateau (Malawi), but equivalent of 90 pairs/km² (4 pairs in 4·5 ha) in NE South Africa. Recorded from Arusha National Park, in Tanzania.

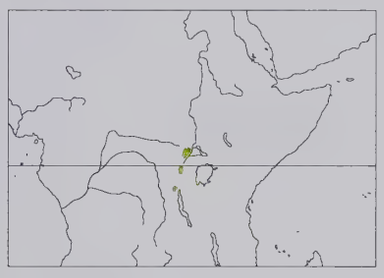
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118. Oberländer's Ground-thrush

Zoothera oberlaenderi

French: Grive d'Oberlaender **German**: Oberländerdrossel **Spanish**: Zorzal de Oberlaender
Other common names: Forest Ground-thrush

Taxonomy. *Geocichla gurneyi oberlaenderi* Sassi, 1914, between Beni and Mawambi, north-eastern DRCongo.
Has in the past been considered a race of *Z. piaggiae* or *Z. gurneyi*. Monotypic.
Distribution. NE DRCongo and W Uganda.



Descriptive notes. 19–20 cm; 41–48 g. Head rufous-brown, with broken white eyering and blackish subocular smudge; darkish olive-rufous upperparts, with darker wing-coverts, and two white-spotted wingbars; dull rufous underparts, shading to whitish from belly to undertail-coverts; bill blackish; legs fleshy-whitish. Sexes similar. Juvenile has darker crown, with dark subocular and auricular smudges, narrow dark submoustachial, pale dull orange breast and flanks with heavy blackish mottling, rest of underparts white. Voice. Song a rambling series of endlessly varied phrases of 2–12 sweet, fluty, mellow whistles, tone and quality recalling *Turdus merula* and race *tanganjicae* of *Z. piaggiae*. Call unreported.
Habitat. Primary lowland and transitional forest, 700–1300 m in north of range, 1080–1420 m in south, and reaching 1850 m in Bwindi and Mgahinga Forests, Uganda. In Bwamba Forest, Uganda, it inhabits (or inhabited) tall stands of ironwood *Cynometra alexandri* with fairly open floor, avoiding areas with dense undergrowth and luxuriant edges. At Ituri Forest, DRCongo, it is apparently restricted to "monodominant" forest, not being recorded from mixed-species or secondary forest.
Food and Feeding. Invertebrates, including slugs, and insect larvae such as caterpillars.
Breeding. Nest found in May–Jun and breeding-condition bird in Jul in Uganda, and fledglings seen in Mar and Sept in DRCongo; probably breeds during rains and at end of dry season. Nest was of dry grasses, strips of vegetation and plant fibres. No other information.
Movements. Probably sedentary; possible local movement suggested by fact that all Ugandan specimens were collected in Jul.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Eastern Zaïre Lowlands EBA. Known only from three areas in DRCongo (Ituri Forest, Semliki Valley and Itombwe Mts) and two in Uganda (Semliki/Bwamba Forest and Bwindi/Impenetrable Forest). Sensitive to forest degradation and loss, which are extensive within its small range, mainly for farmland and timber extraction, especially in Itombwe and Bwamba. May no longer exist in latter owing to destruction of habitat there, and habitat loss at Beni and Kamituga (Ituri), in DRCongo, is also a concern.

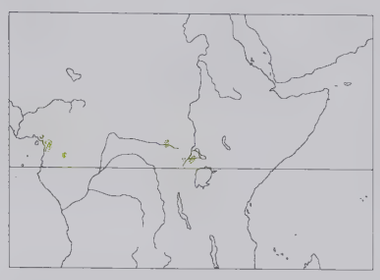
Bibliography. Butynski & Kalina (1993), Clement (1999b), Clement & Hathway (2000), Collar & Stuart (1985), Cramp (1988), Friedmann & Williams (1968), Keith, S. (1968), Keith, S. & Garrett (1994), Keith, S. & Twomey (1968), Lippens & Wille (1976), Plumptre & Mutungire (1996), Prigogine (1965, 1971, 1978, 1980b, 1985), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Urban *et al.* (1997).

119. Black-eared Ground-thrush

Zoothera camaronensis

French: Grive du Cameroun **German**: Kamerundrossel **Spanish**: Zorzal Camerunés
Other common names: Cameroon Ground-thrush (nominate); Grauer's Ground-thrush (*graueri*); Kibale Ground-thrush (*kibalensis*)

Taxonomy. *Geocichla camaronensis* Sharpe, 1905, Efulen, Cameroon.
Race *kibalensis* has been considered a separate species on basis of its higher-elevation habitat (also reportedly larger size, more rufous upperparts, more compressed bill), but *graueri* inhabits similar forest types at only slightly lower altitudes. Race *graueri* has been thought by various authors to be closely related to race *batesi* of *Z. princei*, to which it is very similar in plumage. Three subspecies recognized.
Subspecies and Distribution.
Z. c. camaronensis (Sharpe, 1905) – Cameroon and N Gabon.
Z. c. graueri (Sassi, 1914) – NE DRCongo and W Uganda.
Z. c. kibalensis Prigogine, 1978 – Kibale Forest, in W Uganda.
Descriptive notes. 16·5–18 cm; 42–57 g. Nominate race resembles a small, small-billed version of *Z. gurneyi*, but with distinctive broad dark double bar on paler face, no white eyering, dull orange extending onto neck. Male is dull chestnut-brown above, with brighter rump; bill dark, legs whitish-flesh. Female is paler and duller overall. Juvenile is like adult, but streaked buff on scapulars, mottled blackish below. Race *graueri* is greyer, with duller underparts, sometimes vague dark breast streaks (very similar to race *batesi* of *Z. gurneyi*); *kibalensis* is slightly larger, more rufous above, brighter below. Voice. Song undescribed; calls include thin high "ssreee", probably in alarm, and "tssrr".
Habitat. Lowland primary forest and transition forest, race *graueri* ranging up to 1370 m, *kibalensis* recorded at 1650–1700 m. Nominate race found near forest edge and once on a river island in low vine tangles. Race *graueri* captured in Ituri Forest, in DRCongo, where understorey very open, with



short (c. 40 cm) herb layer of Marantaceae and Zingiberaceae; in Budongo Forest, in Uganda, occurs mainly in tall forest dominated by ironwood (*Cynometra alexandri*) and with fairly clear understorey.
Food and Feeding. Invertebrates, including small snails and insects such as beetles, ants and cockroaches. Forages on ground, scratching at leaf-litter with feet.
Breeding. Nests found Sept–Oct, and breeding-condition bird and fledgling in May, in Uganda; breeding-condition bird in Jun and fledglings and immature in Oct in DRCongo; in W of range (nominate race), breeding in Jul in Cameroon and breeding-condition birds in Dec–Jan and immature in Jun in Gabon. Nest an open, loosely built cup of dead leaves and some twigs and dry bark, with hair-like fungal strands loosely woven to form cup, usually in clear fork of *Rinoria* or *Acalypha* shrub or in small tree (one in fork of fallen dead branch), 1·2–3·5 m above ground and mainly close to research trails. Eggs 2–3 (two clutches of 2 and two of 3 recorded), pale turquoise-blue with brown speckling of variable size and density. All four known clutches were predated.
Movements. Presumably resident.
Status and Conservation. Not globally threatened. Race *kibalensis* known only from two specimens collected in 1966, despite subsequent searches, and evidently very rare. Other races very poorly known and very limited in range, possibly genuinely rare but arguably not under great pressure at present. Nominate race present in Korup National Park, in Cameroon. Density in undisturbed habitat in Ituri Forest (DRCongo) higher than in adjacent Uganda, suggesting that it may be susceptible to forest degradation. In Uganda, occurs almostly exclusively in pristine ironwood forest in Budongo Forest, where at least three pairs found breeding in area of 50 ha.

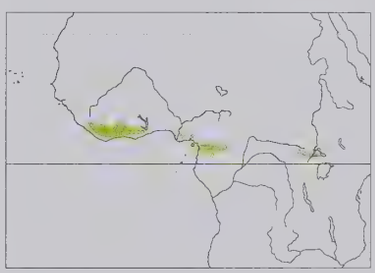
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120. Grey Ground-thrush

Zoothera princei

French: Grive olivâtre **German**: Ghanadrossel **Spanish**: Zorzal de Ghana

Taxonomy. *Chamaetylas princei* Sharpe, 1874, Denkera, in the interior of Fantee, Ghana.
Race *batesi* has been considered by various authors to be closely related to race *graueri* of *Z. camaronensis*, to which it is very similar in plumage. Two subspecies recognized.
Subspecies and Distribution.
Z. p. princei (Sharpe, 1874) – E Sierra Leone and Liberia E to Ghana.
Z. p. batesi (Sharpe, 1905) – SE Nigeria, W & S Cameroon and N Gabon; E DRCongo and W Uganda.



Descriptive notes. 21–22 cm; 59–83 g. Nominate race dark greyish-brown above, with rusty rump and uppertail-coverts; distinctive broad dark double bar on paler face; dark brown flight-feathers, with two well-marked white wingbars; dull twany-buff below, merging into white of belly; bill dark; legs pale pinkish-flesh. Resembles a large *Z. camaronensis*, but greyer and darker above. Sexes similar. Juvenile is as adult, but rustier with buff shaft streaks above, dark-spotted rufous-brown below. Race *batesi* is more olive-brown above, throat duller, flanks brown-tinged greyish; very similar to race *graueri* of *Z. camaronensis*. Voice. Song unknown. Call a long high rolling trill, "tsssrrr", used for contact, and thin high "siiip" in alarm.
Habitat. Lowland primary forest, riverine forest and moist secondary growth, to 550 m in Liberia and 610 m in Cameroon. Keeps to dense shrubby undergrowth and vine tangles, sometimes with herbaceous carpet such as Marantaceae, and often in vicinity of water.
Food and Feeding. Recorded food items to date only animals, mainly invertebrates such as earthworms, snails, millipedes and insects, including grasshoppers and beetles and their larvae; also occasionally small frogs. Forages on ground among leaf litter, digging in moss and debris on rotting wood. Sometimes joins mixed-species flocks or follows army ants. In DRCongo (Ituri Forest), captured where understorey very open, with short (c. 40 cm) herb layer of Marantaceae and Zingiberaceae.
Breeding. Jun and Aug in Liberia, Aug in Nigeria and Oct–Apr in Gabon; breeding-condition birds Mar–Apr in Cameroon; Jun and Oct in DRCongo. Nest a bulky open cup of twigs, plant stems and dead leaves, lined with rootlets and fibres, placed on mat of earthy debris and vegetation 1·5–3 m up in fork in crown of understorey tree. Eggs 1–3, turquoise-blue to emerald-green with lilac undermarkings to reddish-brown spotting and blotching; no information on incubation period; nestling period c. 12 days. In one study, eleven out of 13 nests found were destroyed by predators.
Movements. Sedentary in Gabon, and probably throughout range.
Status and Conservation. Not globally threatened. Considered rare in W Africa, but present in Comoé and Taï Forest National Parks, in Ivory Coast, and locally common in parts of Liberia, e.g. fairly common in Sapo National Park; rare in Korup National Park, in Cameroon. Density in Gabon 1 pair/12 ha (c. 8 pairs/km²). In DRCongo, density in undisturbed habitat in Ituri Forest higher than in adjacent Uganda, suggesting that it may be susceptible to disturbance; in Uganda restricted to Semliki Forest. Vulnerable to forest loss.

Bibliography. Allport (1991), Bannerman (1953), Borrow & Demey (2001), Brosset & Érard (1976, 1977, 1986), Chapin (1953), Clement (1999b), Clement & Hathway (2000), Colston & Curry-Lindahl (1986), Dickerman *et al.* (1994), Dranzoa (1994), Gartshore *et al.* (1995), Gatter (1997), Lindsell (2002), Lippens & Wille (1976), Plumptre & Mutungire (1996), Prigogine (1978, 1985), Rodewald *et al.* (1994), Sinclair & Ryan (2003), Thiollay (1985), Urban *et al.* (1997).

121. Spotted Ground-thrush

Zoothera guttata

French: Grive tachetée **German**: Nataldrossel **Spanish**: Zorzal Moteado

Other common names: Fischer's Ground-thrush (*fischeri*)

Taxonomy. *Turdus guttatus* Vigors, 1831, Algoa Bay, Agrica [= Durban, Natal].
Taxonomic history complex, as has frequently been referred to as *Turdus fischeri*. Birds in N of range of nominate race suggested as belonging to race *belcheri*, but recent reassessment supports current arrangement. Five subspecies recognized.
Subspecies and Distribution.
Z. g. maxis (Nikolaus, 1982) – Lotti Forest, in S Sudan.
Z. g. lippensi Prigogine & Louette, 1984 – SE DRCongo.
Z. g. fischeri (Hellmayr, 1901) – S Tanzania (probably also NE Mozambique); non-breeding N to coastal Kenya.
Z. g. belcheri (Benson, 1950) – Thyolo and Soche Mts, in S Malawi.
Z. g. guttata (Vigors, 1831) – E South Africa (KwaZulu-Natal S to Eastern Cape).



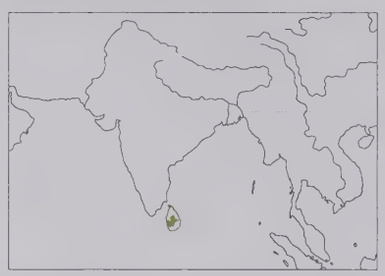
Descriptive notes. 19–23 cm; 45–78 g. Nominate race is fairly large, warm brown above from head to tail, with two white-spotted wingbars (upper bolder and with black basal markings); face and underparts whitish, white lores and half-eyering, smudged blackish subocular vertical stripe and parallel post-auricular stripe, speckled submoustachial area, narrow dark malar, slight buffish wash on breast, extensive blackish-brown spotting from breast and neck to belly; bill dark, yellowish base of lower mandible; legs dull flesh. Sexes similar. Juvenile is rather darker than adult, with buff spotting on head, buffier below. Racial variation very slight: *maxis* is darker above, heavier-spotted and shorter-winged than others, undertail-coverts orange-buff; *fischeri* is slightly smaller than nominate, more olive above, with smaller, sparser spots below; *lippensi* is olive-grey above; *belcheri* is whiter with blacker spots below. Voice. Song of nominate (when breeding) a series of loud phrases of 3–6 sweet melodic notes (first one stressed), "húú-ii-yer swíí-tuut-tuudl prííú-prii-prii-swii", phrases sometimes followed by coda of softer higher trill; song of race *fischeri* (in non-breeding area, not necessarily comparable) quiet, dry, chuckling in quality, rolling and so little phrased as to be almost continuous. Call a thin high "pssssss" or "sriiiii" lasting 0·5 seconds; scarcely audible "tsii-tsii" when foraging; also quiet "tswee".
Habitat. Forest of various types. Coastal lowland moist evergreen forest, especially closed-canopy coral-rag forest, including *Afzelia* forest and dry *Cynometra* thicket; evergreen forest only on Mt Soche and Mt Thyolo at 1370–1530 m in Malawi. In Kenya, non-breeding visitors prefer forest on coral rag and areas with deep shade, patchily sparse undergrowth (thicker patches needed for cover) and thick leaf litter; may occupy home ranges as small as 0·14 ha. In South Africa, breeds in large (more than 100 ha) patches of mature coastal, coastal scarp or valley forests with closed canopy and relatively open understorey, below 600 m; winters in mature coastal lowland thicket, coastal scarp, dune forest (often with *Isoglossa woodii* understorey) and secondary growth, sometimes suburban gardens. Migrants occur in moist bushland, thickets and sometimes gardens farther inland. Single individuals in intermediate forest at 1220 m in Sudan (*maxis*) and in gallery forest near streams at 1750 m in DRCongo (*lippensi*).
Food and Feeding. Earthworms, molluscs, small millipedes (*Prionopetalum*), also insects and their larvae, including termites and ants; also seeds and fruit, e.g. of snake lily (*Scadoxus membraneceus*). Nestlings fed mainly with earthworms. Forages on ground amid leaf-litter and on rotting wood.
Breeding. Nov in Malawi and Oct–Feb in South Africa. Nest a conspicuous, untidy, heavy cup of twigs, leaves, tendrils, roots and grasses, sometimes lined with feathers, fibres and leaf skeletons, usually placed 1·5–2·5 m up in low forest tree, often on horizontal branch adjacent to or at some distance from trunk (*Garcinia gerrardii* favoured in Ngoye Forest, in South Africa), or among lianas or creeper-festooned bush; sometimes in crown of a *Dracaena* plant. Eggs 1–3 (usually 2), greenish-blue to whitish with heavy reddish-brown and greenish-brown blotches; incubation period 14–16 days; nestling period 14–16 days. In South Africa (Dhlinza Forest), overall breeding success 10–20%, c. 50% of nests preyed on, mainly by snakes, raptors and domestic cats, up to five replacement clutches.
Movements. Resident and intra-African migrant. Malawi race (*belcheri*) sedentary. Race *fischeri* migrates N after breeding, using coastal forest patches farther N in Tanzania as migration stopover sites, winters in coastal E Africa late Mar to late Nov, once mid-Dec, mainly May–Oct. In South Africa, Eastern Cape population of nominate race moves NE to spend non-breeding season (Mar–May to Aug–Sept) in KwaZulu-Natal coastal forests, although some, possibly juveniles, remain in Eastern Cape during winter; in KwaZulu-Natal, some breeders are altitudinal migrants towards coast during non-breeding season, although others (e.g. at Dhlinza Forest) appear to be sedentary. Migrates nocturnally.
Status and Conservation. ENDANGERED. CMS Appendix II. Generally very rare, but moderately common at a few localities. Global population estimated at fewer than 2500 individuals. Density of non-breeding population at Gede Ruins (39 ha), in Kenya, estimated at 2·9 birds/ha, yielding 113 birds in total, but this probably the best-known site for the species. Threatened by steady diminution of forest patches in Tanzania and Kenya, although the two known breeding sites in Tanzania (Litipo and Rondo Plateau) are forest reserves, and main wintering site in Kenya (Arabuko–Sokoke, next to Gede) is subject of a long-term sustainable-management project. In Malawi, forest being cleared at all four known sites, despite their status as "forest reserves". In South Africa, mining has destroyed much winter habitat, and disturbance is rendering much of what remains suboptimal; current range in South Africa estimated at 260 km². Eastern Cape population relatively poorly known; population estimates for KwaZulu-Natal are 20–25 pairs at Dhlinza Forest Nature Reserve, 70–100 pairs at Ngoye Forest Reserve, 20–30 pairs at Entumeni Nature Reserve, and 3–5 pairs at Oribi Gorge Nature Reserve; total South African population estimated at 400–800 pairs. Has been suggested that protection of Crowned Hawk-eagle (*Stephanoaetus coronatus*) may improve this thrush's breeding success in KwaZulu-Natal by reducing monkey numbers. In South Africa threatened by low breeding success, poor availability of food, and mortality during migration (migrants often fly against buildings). Races *lippensi* and *maxis* known only from type specimens.
Bibliography. Anon. (1993, 2003), Backhurst & Pearson (1992), Baker & Baker (1992), Belcher (1930), Bennun (1985, 1987, 1992), Bennun & Ngoroje (1999), Benson (1950b, 1951, 1952, 1954), Benson & Benson (1977), Berruti *et al.* (1994), Brieschke (1989), Britton (1980), Brooke (1984b), Burrell & Abel (1976), Chiazzari (1952), Chittenden & Myburgh (1994), Clancey (1955a, 1957a, 1957b, 1985, 1991, 1992), Clement (1999b), Clement & Hathway (2000), Collar & Stuart (1985), Collar *et al.* (1994), Cyrus & Robson (1980), Ginn *et al.* (1989), Harebottle (1994), Harebottle & Barnes (2000), Harebottle *et al.* (1997), Harrison *et al.* (1997), Holsten *et al.* (1991), Irwin (1992), Keith & Twomey (1968), Kelsey & Langton (1984), Lewis & Pomeroy (1989), Lippens & Wille (1976), Liversidge (1957), Maclean (1993), Nikolaus (1982, 1987), Prigogine & Louette (1984), Quickelberge (1969), Sinclair (1984), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Tarboton (2001), Urban *et al.* (1997), Vernon (1983, 1990), Waiyaki & Bennun (2000), Zimmerman *et al.* (1996).

122. Spot-winged Thrush

Zoothera spiloptera

French: Grive à ailes tachetées **German**: Ceylondrossel **Spanish**: Zorzal Alimoteado

Taxonomy. *O.(reocincla) spiloptera* Blyth, 1847, Sri Lanka.
Monotypic.
Distribution. SW Sri Lanka.



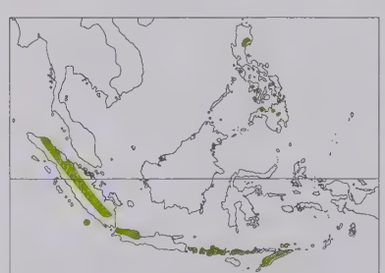
Descriptive notes. 21–23 cm; 70 g. Warm brown above from head to tail, with two white-spotted wingbars; face and underparts whitish, white lores and half-eyering, smudged blackish subocular vertical stripe and parallel post-auricular stripe, speckled submoustachial area, narrow dark malar, slight buffish wash on breast, extensive blackish-brown spotting from neck and breast to belly; bill black; legs dull bluish-flesh. Very similar to *Z. guttata*, but has browner upperparts, whiter face with heavier blackish markings, greyish wash on breast side and flanks, with smaller, more oblong and slightly denser spotting below. Sexes similar. Juvenile is like adult but tinged rustier, with buffy shaft streaks on scapulars, dull buff with less pronounced spotting below. Voice. Song, in early morning or just before dusk, involves loud, beautiful, slurring, melancholy whistles that wander the scale, variable in phrasing, "piii, piii-puu, piii, pip-piii, piii, piii-puu". Calls include quiet "chik-chik" for contact, thin high insect-like "tzsee" or "kriiis" in alarm or unease, often given prior to song in evening, or else "eee, wee eee" before song in morning or evening; also scolding calls.
Habitat. Primary moist evergreen forest, selectively logged areas, secondary regrowth, cardamom jungle, cacao plantations, bamboo thickets, forest edge close to tea plantations and tall scrub, also copses and gardens flanking forest in wet zone. From c. 300 m to 2200 m. At least formerly, also in riverine forest in dry zone.
Food and Feeding. Small invertebrates, including earthworms, spiders, moths, beetles, grasshoppers and other insects and their pupae; also small frogs; also berries and fruit, including wild breadfruit (*Artocarpus nobilis*). Largely terrestrial, up to 90% of time spent on ground during day. Forages mainly in damp leaf litter, vigorously turning over leaves, using three main techniques: probing in soil for earthworms, pecking at ground for surface invertebrates, and gleaning invertebrates from leaves. Sometimes sallies for insects in air.
Breeding. Mainly Mar–May, also Jul–Jan, but eggs also Feb; two or three broods. Pair-bond may last all year; feeding of female by male observed outside season, although breeding virtually continuous, with peaks. Nest an often very ragged cup largely of moss, twigs, roots, bark, grass, leaves and ferns, neatly lined with fine fibres and black rootlets, placed among roots of tree on bank or low in sapling or tree, in crown of tree-fern or amid cardamom fronds; four nests in 1997 were all 1·5–3 m up in sapling. Eggs 2–3, pale buff to bluish-green with light reddish-brown freckles and a few lilac spots; no information on incubation and fledging periods. Nest predation by Sri Lanka Blue Magpie (*Urocissa ornata*) and snakes recorded.
Movements. Apparently sedentary. Historical records of sporadic occurrence in dry zone suggest some form of dispersal, perhaps of first-year birds.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Sri Lanka EBA. Fairly common to common. Greatest abundance apparently in primary habitat, although recent research suggests that secondary habitat may be optimal. Range highly restricted, and forest degradation, fragmentation and disturbance extensive and rapid in recent decades, involving excessive fuelwood collection, conversion to farmland, fire, logging and shifting cultivation; closed-canopy forest declined from 29,000 km² in 1956 to 12,260 km² in 1983.
Bibliography. Ali & Ripley (1987b), Clement & Hathway (2000), Grimmett *et al.* (1998), Harrison (1999), Henry (1998b), Hoffmann (1998), Irwin (1992), Jones *et al.* (1998), Legge (1983), Rasmussen & Anderton (2005), Stattersfield & Capper (2000), Weerakoorn (2004).

123. Sunda Thrush

Zoothera andromedae

French: Grive andromède **German**: Andromedadrossel **Spanish**: Zorzal de Andrómeda
Other common names: Andromeda Thrush

Taxonomy. *Myiothera andromedae* Temminck, 1826, Java and Sumatra.
Despite highly disjunct insular and montane distribution, no geographical variation evident. Monotypic.
Distribution. Sumatra (including Enggano I), W Java, Bali, Lesser Sundas and Philippines (Luzon, Mindoro, Panay, Negros, Mindanao).



Descriptive notes. 23·5–25 cm; 81–108 g. Has blackish-brown head with white eyering, black-stippled whitish lores, submoustachial, chin and ear-coverts; crown shading to darkish grey on mantle and scapulars, latter with black scallop pattern, wings and tail brownish-grey; breast to mid-belly pale grey, shading to white on belly to undertail-coverts, with bold black scalloping (with white internal arrowheads) on flanks; bill very long, blackish; legs brownish-grey. Sexes similar. Juvenile is somewhat browner above, with buff spotting on crown and nape, buff streaking on mantle and scapulars, two buff-spotted wingbars, extensive black scalloping on buff-white underparts. Voice. Undescribed.
Habitat. Understorey of dense primary mossy hill forest and montane forest. Above 1000 m in Philippines; 1200–2200 m in Sumatra, but much lower on Enggano; 460–920 m on Lombok, 450–850 m on Sumbawa, 700–1900 m on Flores, 1200–1600 m on Timor.
Food and Feeding. Insects. Forages in shady cover on forest floor, usually within dense herb layer.
Breeding. Oct–Feb in W Java; in Philippines, Oct on Panay and song and breeding-condition bird in Jun on Mindanao. Nest a solid cup of moss, fine roots, leaf stems and lichen mixed with clay,

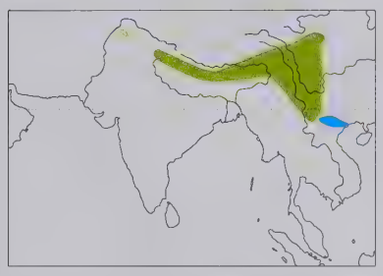
lined with *Arenga* palm fibre, in one case placed 4·6 m up in tree fork. Eggs 2–3, buff with brownish speckling. No other information.
Movements. Uncertain whether resident or migratory in Philippines.
Status and Conservation. Not globally threatened. Presence in montane forest renders it relatively secure, at least at present. Rare and local in Philippines. Judged locally fairly common in Sumatra and on Enggano I, but confirmation of current status on both islands desirable. Rare, both spatially and numerically, in W Java; rare but more widespread on Bali. Generally uncommon to rare in Lesser Sundas.
Bibliography. Andrew (1985), Brooks *et al.* (1992), Clement & Hathway (2000), Coates & Bishop (1997), Dickinson *et al.* (1991), Dutson *et al.* (1992), Hellebrekers & Hoogerwerf (1967), Kennedy *et al.* (2000), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Ripley & Rabor (1958), White & Bruce (1986).

124. Plain-backed Thrush

Zoothera mollissima

French: Grive de Hodgson **German**: Felserddrossel **Spanish**: Zorzal Dorsiliso
Other common names: Plain-backed Mountain Thrush

Taxonomy. *T.(urdus) mollissimus* Blyth, 1842, Darjeeling, India.
May belong to *Z. dauma* group. Three subspecies recognized.
Subspecies and Distribution.
Z. m. whiteheadi (Stuart Baker, 1913) – NW Himalayas (N Pakistan).
Z. m. mollissima (Blyth, 1842) – C & E Himalayas (from N India) E to S China (SE Xizang, SW Sichuan, N Yunnan).
Z. m. griseiceps (Delacour, 1930) – SC China (N Sichuan S to C & E Yunnan) and NW Vietnam (W Tonkin).



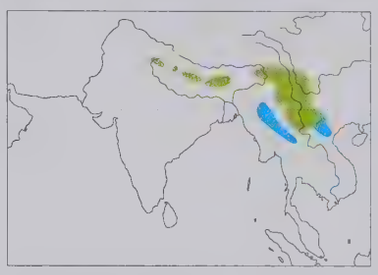
Descriptive notes. 25–27 cm; 80–112 g. Nominate race is plain warm olive-brown above from crown to tail, with whitish eyering, buffy face marked dark below eye, on rear ear-coverts and on malar; buffy-white below, dense black crescents from lower throat to lower belly, undertail-coverts clearly patterned with brown and whitish; bill dark, paler lower mandible; legs flesh-coloured. Sexes similar. Immature is duller, with buffy shaft streaks from nape to scapulars, buffier on breast and neck. Race *whiteheadi* is paler and more olive-toned than nominate; *griseiceps* is marginally larger and deeper-billed, more rufous above, darker on crown. Voice. Song, from hidden position on side branch of tall tree, usually a short complex set of whistled phrases rising in pitch and volume, lasting c. 3 seconds, and repeated every few seconds, "plii-tuu tititi plii-chuu ch-uppl-uup", similar to that of *Z. dauma* but slightly quicker and more varied; may instead be mix of trills with no change in pitch or volume. Calls include sharp grating rattle in alarm, and thin "chuck".
Habitat. Breeds in shady damp areas in alpine meadows, boulder-strewn grassy slopes with tree-line shrubbery of oak, rhododendron and conifers, at 3000–4500 m in Himalayas but c. 1600–2900 m in Vietnam. In Pakistan breeds on precipitous stony slopes with patches of creeping juniper (*Juniperus communis*), using other forest habitats (spruce, fir and pine) temporarily during spring ascent to breeding elevations. In non-breeding season, in open bushy country, cultivations, valleys and forest down to 1300 m.
Food and Feeding. Insects, snails, leeches; also berries, seeds. Forages on ground in shade. Skulking. Turns over leaves and rotting vegetation; probes in earth. Sometimes in loose flocks in non-breeding season.
Breeding. Apr–Jul in Himalayas, mainly Jun–Jul in Pakistan. Nest a large cup of vegetation, including moss, lined with fine fibres, placed on or near ground amid tree roots or on rock ledge. Eggs 4, dull whitish with much deep red and reddish-brown spotting. No further information available.
Movements. Undertakes seasonal vertical movements and relatively short-distance migrations. Nominate race recorded once in Myanmar.
Status and Conservation. Not globally threatened. Very rare and local in Pakistan. Fairly common in Nepal. Uncommon in China.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Clement & Hathway (2000), Delacour & Jabouille (1931), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Vaurie (1955a, 1972).

125. Long-tailed Thrush

Zoothera dixoni

French: Grive de Dixon **German**: Dixondrossel **Spanish**: Zorzal de Dixon
Other common names: Long-tailed Mountain Thrush

Taxonomy. *Geocichla dixoni* Seebohm, 1881, Himalayas.
May belong to *Z. dauma* group. Monotypic.
Distribution. C & E Himalayas and SE Xizang, NE Myanmar and S China (Sichuan, S & W Yunnan); non-breeding also Thailand, N Indochina.



Descriptive notes. 25 cm; 71–125 g. Plain warm olive-brown above from crown to tail, with whitish eyering, buffy face marked dark below eye, on rear ear-coverts and on malar; two buff-spotted wingbars; buffy-white below, with fairly dense black crescents from lower throat to lower belly, undertail-coverts creamy-buff; bill dark; legs flesh-coloured. Very like *Z. mollissima*, differing most obviously in wingbars, slightly less dense scaling below, and notably longer tail. Sexes similar. Immature has buff shaft streaks from nape to scapulars. Voice. Song a slow, arbitrary, protracted series of phrases consisting of squeaky rasps, fluty chortles, dry trills and twitters, "wuut-cheet-sher zwheer zwit yowowoit preet", much less musical than that of *Z. mollissima*. Call apparently undocumented.
Habitat. In Himalayas breeds in dense fir, juniper and birch–rhododendron forest, at 3000–4200 m, wintering in dense forest, open bushy country and second growth at 1500–3000 m. In E of range breeds in broadleaf evergreen forest, rhododendrons and conifers, at 2135–3655 m, moving down to 1000 m in winter, when often near streams; in China at 1200–4000 m (presumably all-year extremes). In winter, in evergreen forests above 1400 m in Thailand.
Food and Feeding. Largely terrestrial. Often seen while foraging along leafy tracks and roadsides. Occasionally in small flocks in non-breeding season; occurs in mixed thrush flocks.
Breeding. May–Jul in Himalayas. Nest a large cup of twigs and moss, lined with grass, placed up to 3 m above ground in low tree. Eggs 3, dull greenish with reddish-brown blotches and stippling. No other information.
Movements. Largely resident, but with seasonal vertical movements, probably some short-distance migrations. In NE Myanmar several records in winter suggest seasonal influx there; also non-breeding visitor to NW Thailand and N Laos.
Status and Conservation. Not globally threatened. Fairly common; uncommon in Myanmar and China. Scarce to uncommon in winter SE Asia.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Clement & Hathway (2000), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Vaurie (1955a, 1972).

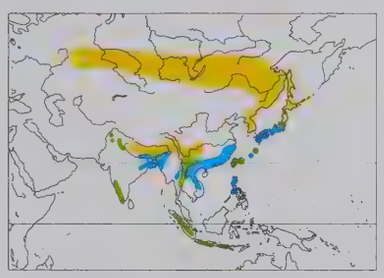

ssp dauma
ssp major
127
126
ssp neilgherriensis
128
ssp aurea
ssp heinei
130
ssp talaseae
131
129
ssp papuensis
ssp eichhorni
ssp atrigena
132
133
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137
♂
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ssp chubbi
138
ssp leucogenys
140
PLATE 63
inches 4
cm 10

126. **Common Scaly Thrush**

Zoothera dauma

French: Grive dama **German**: Himalajaerddrossel **Spanish**: Zorzal Dorado del Himalaya
Other common names: White's Thrush (when split, limited to *aurea*/*toratugumi*), Golden/Golden-spangled Mountain-thrush, Tiger Thrush; Small-billed Mountain-thrush (*dauma*); Amami Thrush (*major*); Horsfield's/Spot-winged Thrush (*horsfieldi*); Nilgiri Thrush (*neilgherriensis*)

Taxonomy. *Turdus Dauma* Latham, 1790, Kashmir, India.
Forms a group, possibly a superspecies, with *Z. imbricata*, *Z. lunulata*, *Z. heinei*, *Z. machiki*, *Z. talaseae*, *Z. margaretae*, *Z. turipavae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. First four, at least, of these previously considered conspecific with present species, and *Z. lunulata* possibly better treated as such. Taxonomy highly fluid and confusing, and various recent arrangements have been attempted. Migratory races *aurea* and *toratugumi* often split off as a separate species, apparently very distinct vocally from nominate; and resident *major*, *horsfieldi* and *neilgherriensis* separated as three further species, although last-mentioned may belong with *Z. imbricata*. Race *major* has for two decades been treated as separate owing to its vocal differences from *aurea* and *toratugumi*, but it is vocally close to nominate, and the seeming intergradation in SE Asia of certain plumage characters demarcating nominate and *aurea* represents a problem that also affects the status of *horsfieldi*, although latter is mensurally distinctive (but sings like *aurea*). Thus, if voice used as a decisive taxonomic character, equatorial *horsfieldi* may be judged conspecific with N *aurea*, and Japanese *major* with (mainly Himalayan) nominate. Furthermore, resident population on Iriomote Jima (in S Ryukyu Is) apparently belongs to an undescribed race, while resident population on Taiwan, often treated within *horsfieldi*, remains racially indeterminate. Considerable effort required to assemble and analyse extensive specimen and vocal evidence before a strong case can be made for any one arrangement over another. Six subspecies currently recognized.
Subspecies and Distribution.
Z. d. aurea (Holandre, 1825) – E European Russia and S Siberia E to N Mongolia and Sea of Okhotsk; non-breeding S & SE China, Taiwan, mainland SE Asia, N & W Philippines.
Z. d. toratugumi (Momiyama, 1940) – Russian Far East (Amurland) and Sakhalin S to Korea, Japan and S Kuril Is; non-breeding mainly E China and Taiwan.
Z. d. major (Ogawa, 1905) – Amami I, in N Ryukyu Is.
Z. d. dauma (Latham, 1790) – W Himalayas (including Pakistan) E to Assam, SC China (Sichuan S toYunnan and Guangxi), N Myanmar, N & W Thailand and N Indochina; non-breeding mainly S & SE Asia.
Z. d. neilgherriensis (Blyth, 1847) – SW India.
Z. d. horsfieldi (Bonaparte, 1857) – Sumatra, Java, Bali, Lombok and Sumbawa.
Also breeds (racial identities unsettled) on Iriomote Jima (S Ryukyu Is) and Taiwan.



Descriptive notes. 24–30 cm; 88–103 g. A large, golden-olive to yellowish-looking thrush, scaled black on white above and below (white on belly and vent), with tinges of buff on upperparts and in wings, which have blackish tips of primary coverts, yellowish to whitish tips of median and greater wing-coverts (two pale wingbars), and yellowish edgings of mid-lengths of flight-feathers and primary coverts; tail blackish, central feathers paler and greyer, white tips of outer feathers; underwing blackish, axillaries white, broad pale buff central band. Nominate race has face rather plain whitish, with white eyering, black-stippled malar and ear-coverts, blackish auricular mark; bill rather large, blackish, paler lower mandible; legs flesh. Sexes similar. Juvenile is buffier above, more spotted than scaled below. Race *aurea* is very like nominate, but bill longer, eyering stronger, auricular spot stronger, cheek and malar stippling weaker, upperparts paler with scaling stronger, broader and more rounded; *neilgherriensis* resembles previous, but smaller, shorter-tailed, shorter-legged, bill larger and darker, plumage richer and darker above without pale spangles, scaling below including belly and vent (approaching *Z. imbricata* in appearance); *toratugumi* is smaller; *major* is marginally larger and longer-tailed, with 12 (not 14) rectrices (this character not, however, constant across taxa and represents a W–E cline with little diagnostic value), paler rump, more limited pale bases of primaries, more limited and duller pale band on underwing, buffier underparts, more heavily mottled face with bare pink area behind eye; *horsfieldi* has slightly stronger malar, longer bill and tarsus, shorter legs and tail. Voice. Song of nominate a rather rapid but disconnected series of abrupt, simple, rich notes mixed with squawks, e.g. "pur-loo-trii-lay [repeated] dur-lii-dur-lii [repeated twice] drr-drr-chew-you-wi-iiii [repeated]", sometimes a more languid, continuous stream of notes of same type, "chirrup chwee chueu weep chirrol chup". Song of *major* reportedly similar to nominate, also likened to that of *Z. sibirica*. Song of races *aurea* and *toratugumi* a slow, variably pitched, mechanical series of thin melancholy long-drawn whistles, "huuwiiii wiiiuuuu piii-yuuu" (also written as "bbrrriiinnngggggg"), each c. 1·5 seconds long and delivered several seconds apart, the whole gaining in volume before dying away; in Japan, where consists of twinned ascending whistles ("hyeee-juweee"), thought to be duet by pair. At close range, very soft, squeaky twittering between main notes sometimes audible. Songs commonly given very late and very early in day, often in virtual darkness, and often for brief period only. Calls when foraging include "chick" and strange breathy rasps, including "zieh", "chuck-chuck" in alarm and raspy "traattchh" repeated every 3–4 seconds; quiet plaintive whistle for contact between pair-members.
Habitat. In Russia, race *aurea* breeds in dark coniferous and mixed forests of S boreal zone and dark taiga zone, typically in spruce (*Picea*) forests along river valleys, wooded steppe, mixed or broadleaf stands on ridges and slopes, open woodland with larch (*Larix*), birch (*Betula*) and aspen (*Populus*), often in headwater areas. Race *toratugumi* breeds in montane and submontane forests in Korea; in Japan it occupies damp deciduous or mixed forest with dense undergrowth, chiefly at 500–1600 m in C Honshu, 0–800 m in Hokkaido; *major* found at 100–400 m on Amami. Race *aurea* winters in broadleaf evergreen forest, selectively logged and montane forest, bamboo groves and copses at all elevations, also urban parks, open grassy areas such as lawns, picnic areas and golf courses adjacent to tree cover; in Japan in less dense cover than when breeding; on non-breeding grounds in Philippines from sea-level to 1000 m, but often seeming to prefer higher slopes. In Himalayas, nominate race breeds in mature broadleaf forest, e.g. oak (*Quercus*), and conifer forest, e.g. silver fir (*Abies*) and spruce, with dense bushy understorey and apparently deep moist soil, at 2400–3600 m; winters in dense forest with bracken-dominated undergrowth, grassy clearings, edges of pastures, sal forest, wooded streamsides, bamboo clumps and mango groves, from plains to 1800 m. In SW India (*neilgherriensis*) occupies dark wet areas such as ravines within dense evergreen forest and sholas, at 600–2100 m. Race *horsfieldi* found in montane and rhododendron forest at 920–2800 m on Lombok, at 2000–3000 m in Sumatra; on Sumbawa in open casuarina forest with understorey of giant nettles, ferns and shrubs, at 1700 m.
Food and Feeding. Invertebrates, including worms, insects and their larvae, small slugs and snails; also berries. Stomach of bird from Thailand contained large hard fruits; stomachs from Russia held worms, small caterpillars and grasshoppers; individuals in E China had eaten beetles (Apr) and berries (Oct). Insects and fruits reported as taken by race *major* on Amami, although food passed by male to incubating female was 95% earthworms, with consumption rate of 13–14 per day (minimum 50 g biomass). Seven items fed to nestlings were three earthworms, two cerambycid larvae and two adult insects. Forages on ground or in low vegetation, with shivering nervous bobbing walk, often rapidly fanning and raising tail; turns over leaf litter with bill. Active at first and last light, when often uses forest tracks and roads.
Breeding. Late May to Aug (probably earlier) in Siberia, May–Aug in N Korea and Apr–Aug in Japan; May–Jun on Amami (race *major*); Apr–Jun in Himalayas and Aug in N Thailand; Mar–Jun in SW India; Jan and Jun in Java. Nest a large cup of moss, twigs, grass and roots (once entirely of pine needles), with rim of mud, twigs and moss as basal fixative, lined with fine rootlets, fern stems and fibres, placed 1–6 m up in tree fork, bush or bank; one nest on Amami (race *major*) 11·5 m up in main fork of *Schefflera octophylla*; nest often placed near that of *Turdus rubrocanus* in Pakistan. Eggs normally at least 3; 3–5 in Japan (*aurea*), but 1–2 in S of range (*horsfieldi*); glossy, bright salmon-coloured with slight darker markings, those of *aurea* usually slightly duller and paler ("brick-ochre") than in nominate, of *horsfieldi* pinkish-buff, of *neilgherriensis* slightly glossy, dark dull grey-brown with vague markings. No other information.
Movements. Mostly migratory, but resident in some parts of range, notably races *major*, *neilgherriensis*, *horsfieldi* and populations of Iriomote Jima (S Ryukyu Is) and Taiwan. Populations from Siberia and N China shift SE to penetrate broad area of E China, Indochina and Philippines; leave breeding grounds from late Aug through to Oct (at L Baikal from late Sept to early Oct), arriving in winter quarters from Oct; main autumn passage at Beidaihe (NE China) Sept–Oct. Present on winter grounds in Hong Kong early Nov to third week Apr (peak end Dec to early Feb), and in Philippines Nov to mid-May; spring emigration starts Mar in S China, passage in NE mid-Apr to mid-May, arrival on breeding grounds Irkutsk and Novosibirsk mid-May, although migration still evident at L Chany in mid-Jun. In Japan migratory in N, leaving Hokkaido and N Honshu Oct, returning second half Mar; resident S from C Honshu. Altitudinal migrant in Himalayas; in Pakistan, this may be more E–W along outer foothills as no records from N plains, and many males singing in early May in Murree Hills pass farther NW in Hazara and Neelum Valley if failing to attract mates. Vagrants (race *aurea*) recorded as far W as Greenland and W & S Europe.
Status and Conservation. Not globally threatened. Probably commoner than supposed from records, owing to its highly furtive behaviour. Population in European Russia estimated in 1990s at 20,000–22,000 pairs, and breeding numbers E of Urals stable; by 2000, total European Russian population revised to 25,000–100,000 pairs, but trend unknown. In Siberia, generally reported at relatively low densities, e.g. 1·5 pairs/km² in Krasnoyarsk, but in appropriate habitat (dense coniferous or mixed woods near water) up to as many as 56 birds/km². Fairly common breeder in China (and fairly common winter visitor in Shanghai area); uncommon in E Russia. In Korea, scarce in N but common in S. Fairly common in Japan; decline in first half of 20th century attributed to over-trapping of migrants for food, because residents also then freely taken, although illegally. Uncommon to scarce in Pakistan, e.g. only two singing males in 5 km² in Manshi Reserve Forest (Shahran); uncommon in Thailand. Apparently uncommon, but highly elusive, in SW India. Race *horsfieldi* uncommon throughout range, with few records and few known localities in Sumatra. Uncommon in winter in Philippines (race *aurea*). One race globally threatened: Amami I *major* often treated as a separate species, and then categorized as Critical; conflicting reports on its population level, but highest estimate only 75 pairs. This also a restricted-range taxon, present in Nansei Shoto EBA, where entire population confined to Amami's small remaining areas of mature broadleaf forest, now only 10–15 km² in extent; key threats are clearance of this important habitat and the spread through the island of Javan mongoose (*Herpestes javanicus*), introduced for snake control.
Bibliography. Ali (1977), Ali & Ripley (1987b), Anon. (2000a, 2004e), Austin (1948), Austin & Kuroda (1953), Beaman & Madge (1998), Beehler *et al.* (1986), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Clement & Hathway (2000), Coates & Bishop (1997), Collar (2004b), Collar *et al.* (2001), Cramp (1988), Danielsen *et al.* (1994), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dickinson *et al.* (1991), Dornberger & Barthel (1997), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Glutz von Blotzheim & Bauer (1988), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Herklots (1967), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Kannan (1998), Kennedy *et al.* (2000), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Martens & Eck (1995), Medway & Wells (1976), Mees (1977), Meyer de Schauensee (1984), Piechocki *et al.* (1982), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Schodde & Mason (1999), Smythies (1986, 1999), Sowerby (1943), Stattersfield & Capper (2000), Takashi *et al.* (1999), Tomek (2002), Vaurie (1955c, 1972), White & Bruce (1986), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

127. **Sri Lanka Scaly Thrush**

Zoothera imbricata

French: Grive de Ceylan **German**: Ceylonerddrossel **Spanish**: Zorzal Dorado de Ceilán

Taxonomy. *Zoothera imbricata* E. L. Layard, 1854, Sri Lanka.
Usually treated as a race of *Z. dauma*. Belongs in a group, possibly a superspecies, formed by that species and *Z. lunulata*, *Z. heinei*, *Z. machiki*, *Z. talaseae*, *Z. margaretae*, *Z. turipavae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. Race *neilgherriensis* of *Z. dauma* may belong with present species. Monotypic.
Distribution. SW Sri Lanka.

On following pages: 128. Bassian Thrush (*Zoothera lunulata*); 129. Russet-tailed Thrush (*Zoothera heinei*); 130. Fawn-breasted Thrush (*Zoothera machiki*); 131. New Britain Thrush (*Zoothera talaseae*); 132. San Cristobal Thrush (*Zoothera margaretae*); 133. Guadalcanal Thrush (*Zoothera turipavae*); 134. Long-billed Thrush (*Zoothera monticola*); 135. Dark-sided Thrush (*Zoothera marginata*); 136. Varied Thrush (*Ixoreus naevius*); 137. Aztec Thrush (*Ridgwayia pinicola*); 138. Rufous-brown Solitaire (*Cichlopsis leucogenys*); 139. White-eared Solitaire (*Entomodestes leucotis*); 140. Black Solitaire (*Entomodestes coracinus*).



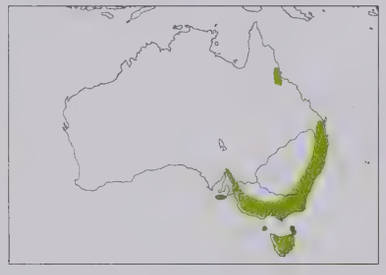
Descriptive notes. 24 cm. Olive-brown above, heavily scaled black; throat whitish, rest of underparts rich tawny-buff, heavily scaled black, with whitish on belly and vent; bill rather large, blackish, paler lower mandible; legs flesh. Smaller and shorter-tailed than *Z. dauma*, with more richly coloured underparts. Sexes similar. Immature undocumented. Voice. Song a series of 8 or more rich single whistles, "tiyeuur", each c. 1 second long, mellower and more slurred than that of *Z. dauma*. Territorial threat a high repeated "tchiss"; also utters repeated high, long-drawn whistle recalling song of *Myophonus blighi*, context unknown.
Habitat. Dense moist forest in wet zone, at 600–1800 m; also copses, shade coffee plantations, parks.
Food and Feeding. Insects and other invertebrates of leaf litter. Forages mainly on ground, scratching about amidst wet debris.
Breeding. Feb–May and Jul–Oct. Nest a large mossy cup, lined with fine fern roots, placed 4–6 m up in sapling or tree in dense forest, sometimes in shade tree in tea estate near forest edge. Eggs 2, bluish-white to pale olive-green with faint chestnut markings. No other information.
Movements. Resident, with some vertical movements.
Status and Conservation. Not globally threatened. Rare to uncommon, but widespread.
Bibliography. Clement (1999c), Clement & Hathway (2000), Dutson (2005c), Harrison (1999), Henry (1998b), Hoffmann (1998), Legge (1983), Rasmussen & Anderton (2005), Tunnard (1922a), Warakagoda (2001).

128. **Bassian Thrush**

Zoothera lunulata

French: Grive à lunules **German**: Tasmanerddrossel **Spanish**: Zorzal Lunado
Other common names: Olive-tailed Thrush, Australian/Spot-winged Thrush

Taxonomy. *Turdus lunulata* Latham, 1801, Sydney, Australia.
Belongs in a group, possibly a superspecies, which also contains *Z. dauma*, *Z. imbricata*, *Z. heinei*, *Z. machiki*, *Z. talaseae*, *Z. margaretae*, *Z. turipavae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. Formerly treated as a race of *Z. dauma*; very similar in plumage and egg colour, but different in tail-tip pattern; wide geographical separation, with intervening related species (*Z. heinei*, *Z. machiki*), tends to support species status, but detailed evaluation of evidence needed, and present treatment provisional. Has been though to include *Z. heinei* as a small race, but the two recently shown to be sympatric without interbreeding, and songs somewhat different. Isolated race *cuneata* structurally rather distinct, and speculated as representing a different species. Described race *macrorhyncha* (from Tasmania) synonymized with nominate. Three subspecies recognized.
Subspecies and Distribution.
Z. l. cuneata (De Vis, 1890) – NE Australia (NE Queensland).
Z. l. lunulata (Latham, 1801) – SE Australia, Tasmania, and islands in Bass Strait (King I, Flinders I).
Z. l. halmaturina (A. G. Campbell, 1906) – SE South Australia, in Mt Lofty Range, Telowie Gorge Conservation Park and Wittaburra Forest, and on Kangaroo I.



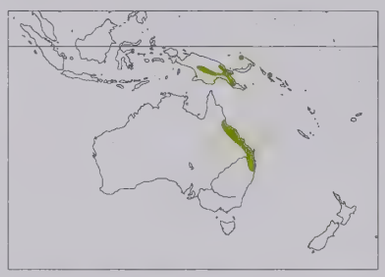
Descriptive notes. 27–29 cm ; 90–120 g. Dark olive-brown above, heavily scaled black; throat whitish, rest of underparts whitish, heavily scaled black; bill moderately large, blackish, paler lower mandible; legs flesh. Very similar to *Z. dauma*, but has heavier scaling above, rump to tail olive without rufous tinge; more pointed wings and more white on tail tips (but much less than in *Z. heinei*). Sexes similar. Immature has finer dark markings above, more spotted than scaled below. Racial variation slight: *cuneata* is longer-billed, shorter-tailed and slightly darker than nominate, with richer brown upperparts, more extensive cinnamon wash on underparts, longer wing; *halmaturina* is like nominate but more greyish above, weaker cinnamon wash on breast. Voice. Song a series of phrases consisting of 3 far-carrying whistled trills, first and third level, second upslurred, "wheeer-aoo-whooo", with variations, sometimes continuing as soft tuneful warbled subsong. Calls include thin ascending "seep" as contact; high staccato cricket-like "chi-lit" in mild alarm, protracted ascending "seeeee" in response to "chi-lit"; flat "seeeee" while feeding young; variably pitched rapid "see-see-see-see-see", by displaying bird to another that was 10 m away from nest with young.
Habitat. Cool damp forests, including rainforest, eucalypt forest and woodland, in areas with closed canopy and dense moist leaf litter, heavily vegetated gulleys, wooded gardens; mostly in areas where annual rainfall more than 800 mm, but also in gulleys and stringybark and box–ironbark forests (with more than 600 mm) along coasts and in certain inland areas. Damp habitats may be particularly important in summer. Common in pine plantations 7–15 years old with complete canopy cover, and in older plantations with remnant native vegetation. Where co-occurring with *Z. heinei*, occupies higher areas (above 500 m) that that species. On Kangaroo I, race *halmaturina* found in damp eucalypt forest but also uses mature mallee eucalypt woodland; much of habitat confined to creek lines and dune swales.
Food and Feeding. Earthworms, insects, molluscs and fallen fruit. In one study, diet estimated to be 95% earthworms (c. 5 cm in length) by volume, the rest small invertebrates. Forages on ground in silent stop-start movements, pausing to listen and probe in substrate to depth of bill. In study, success rate one worm every 4 minutes, although while feeding two nestlings this increased to two worms per minute.
Breeding. Jul–Jan. Nest a rounded cup made of bark strips, leaves and grasses, camouflaged externally with green moss, lined with rootlets, placed up to 15 m off ground in stump, crown of tree-fern, tall shrub or tree (e.g. pine, musk-tree); one nest placed on ledge at top of entrance to 7-m-high cave. Eggs 2–3, pale stone-grey to pale creamy-grey, densely speckled reddish-brown; no information on incubation period; nestling period 14 days. Generation length of race *halmaturina* estimated at 4 years.
Movements. Resident; post-breeding dispersal, sometimes even reaching inland to C R Murray system in non-breeding period.
Status and Conservation. Not globally threatened. Common. Nominate race has declined near settled areas, such as Melbourne. Race *halmaturina* nationally red-listed as "Near-threatened"; has lost at least half of its original range to agriculture and, on mainland, continues to face problems from damming of creeks (which desiccates leaf litter downstream), cattle grazing, risk of wildfire (which destroyed several important sites in 1983) and, possibly, the introduced *Turdus merula*; population estimated at 12,000 breeding individuals, and decreasing with decrease in area of occupancy (1000 km²).
Bibliography. Blakers *et al.* (1984), Clement & Hathway (2000), Cooper (1959), Edington (1983), Emison *et al.* (1987), Ford (1983), Garnett & Crowley (2000), Holmes (1984), Pizzey (1980), Schodde & Mason (1999), Schodde & Tidemann (1986).

129. **Russet-tailed Thrush**

Zoothera heinei

French: Grive de Heine **German**: Heineerddrossel **Spanish**: Zorzal de Heine
Other common names: Papuan Olive-tailed Thrush (*papuensis*)

Taxonomy. *Oreocincla Heinei* Cabanis, 1850, Japan; error = Queensland, north Australia.
Belongs in a group, possibly a superspecies, which also contains *Z. dauma*, *Z. imbricata*, *Z. lunulata*, *Z. machiki*, *Z. talaseae*, *Z. margaretae*, *Z. turipavae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. In the past was treated as a race of *Z. dauma*. Has also been considered conspecific with *Z. lunulata*, but in Australia the two occur sympatrically without interbreeding, and also differ in song and egg colour; supposed intergrades probably immature *Z. lunulata*. Four subspecies recognized.
Subspecies and Distribution.
Z. h. papuensis (Seebohm, 1881) – WC to SE New Guinea.
Z. h. eichhorni (Rothschild & Hartert, 1924) – Mussau, in St Matthias Group (Bismarck Archipelago).
Z. h. choiseuli (Hartert, 1924) – Choiseul, in Solomon Is.
Z. h. heinei (Cabanis, 1850) – E (possibly also NE) Queensland and NE New South Wales, in E Australia.



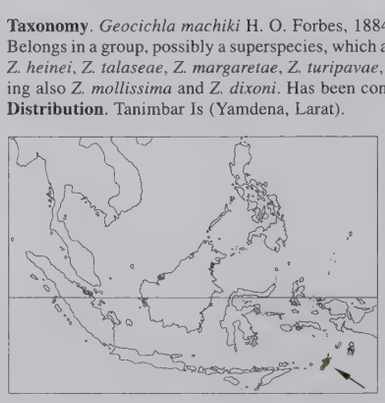
Descriptive notes. 23–27 cm; 85–115 g. Dark olive-brown above, heavily scaled black, with two pale brown wingbars; throat whitish, malar stripe pale tawny-pink; upper breast pale tawny, rest of underparts white, all heavily scaled black; bill pale brown; legs greyish-pink or greyish-yellow. Very similar to *Z. lunulata*, but slightly smaller, eye seemingly larger, rump and uppertail warm rufous, former with only weak barring, outer tail with more white at tips. Sexes similar. Juvenile is very like adult, but with less pronounced dark scalloping. Race *papuensis* is smaller and darker than nominate; *eichhorni* is smaller still, paler, especially below, with reduced dark scaling, strong whitish bases of primaries; *choiseuli* is very like previous, but with more rufous tinge in wing spots and rump, buffier on breast. Voice. Song in Australia (apparently) a series of prolonged descending double whistles, "wheeer-dooo", or of 2 clear notes connected by upslurred middle note, "tlee-oo-whee"; calls supposedly include strong 2-note "theea thooa", but this could be the song. Song of other races unknown; calls of *eichhorni* a very thin sibilant "tssep", louder than similar call of Bismarck Honeyeater (*Myzomela cineracea*), also loud chacking alarm, a rushed series of "chuk" or "tak" notes, similar to call of *Turdus poliocephalus*.
Habitat. Primary foothill and hill rainforest and wet eucalypt with closed canopy and deep leaf litter, below 750 m in Australia; in New Guinea in middle mountains at 490–1700 m, mostly around 1200 m. On Mussau, where highest point is only 650 m, found in overgrown gardens near sea-level.
Food and Feeding. Worms and molluscs; also some fruit. Forages on ground in forest; comes to edges and on to tracks in early hours of day. In New Guinea, race *papuensis* reported as bobbing slowly while foraging.
Breeding. Aug–Jan. Nest a large cup made from bark strips, dry grasses and leaves, covered with moss, lined with fine roots, placed up to 15 m above ground in tree fork or on old stump, well concealed. Eggs 2–3 (2 in New Guinea), pale greenish-blue to rich sky-blue with sparse chestnut and clay-coloured spotting. No other information.
Movements. Local seasonal and altitudinal movements in Australia.
Status and Conservation. Not globally threatened. Rare (certainly only rarely encountered) in New Guinea; moderately common in Australia. Locally fairly common on Mussau (race *eichhorni*). Race *choiseuli* known from only a single record, in 1924.
Bibliography. Blakers *et al.* (1984), Clement & Hathway (2000), Coates (1990), Diamond (1972), Doughty *et al.* (1999), Ford (1983), Holmes (1984), Pizzey (1980), Rand & Gilliard (1967), Schodde & Mason (1999), Schodde & Tidemann (1986).

130. **Fawn-breasted Thrush**

Zoothera machiki

French: Grive à poitrine fauve **German**: Tanimbarerddrossel **Spanish**: Zorzal de Tanimbar

Taxonomy. *Geocichla machiki* H. O. Forbes, 1884, Timor-Laut, Tanimbar Islands.
Belongs in a group, possibly a superspecies, which also contains *Z. dauma*, *Z. imbricata*, *Z. lunulata*, *Z. heinei*, *Z. talaseae*, *Z. margaretae*, *Z. turipavae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. Has been considered a subspecies of *Z. dauma*. Monotypic.
Distribution. Tanimbar Is (Yamdena, Larat).



Descriptive notes. 21–22 cm. Rather warm mid-brown above, shading to slightly russet on rump and tail, with very slight darker scaling on body feathers; pale-edged wings with two well-marked pale wingbars; throat, breast and central belly pale golden-buff, lightly scaled black, merging on to whitish lower belly and flanks, rather more heavily scled black; bill black, yellowish base of lower mandible; legs ochraceous-flesh. Sexes similar. Juvenile unknown. Voice. Song a series of plain whistled or piping notes; call a sharp "tsit".
Habitat. Primary forest; occasionally secondary scrub and recently burnt areas.

Food and Feeding. Forages in dense scrub, but also in open on tracks through wooded areas.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Banda Sea Islands EBA. Locally common in primary forest. Significant logging activity in S Yamdena must be reducing habitat within its very small range.
Bibliography. Clement & Hathway (2000), Coates & Bishop (1997), Johnson & Stattersfield (1990), Schodde & Mason (1999), Stattersfield & Capper (2000), White & Bruce (1986).

131. New Britain Thrush

Zoothera talaseae

French: Grive de Nouvelle-Bretagne **Spanish**: Zorzal de Nueva Bretaña
German: Bismarckerddrossel
Other common names: Talasea Thrush

Taxonomy. *Turdus talaseae* Rothschild and Hartert, 1926, Talasea, New Britain.
Belongs in a group, possibly a superspecies, which also contains *Z. dauma*, *Z. imbricata*, *Z. lunulata*, *Z. heinei*, *Z. machiki*, *Z. margaretae*, *Z. turipavae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. Often considered to embrace *Z. margaretae* and *Z. turipavae*, but differs from both significantly in plumage. Race *atrigena* distinctive, possibly a separate species. Two subspecies recognized.
Subspecies and Distribution.
Z. t. talaseae (Rothschild & Hartert, 1926) – New Britain and Umboi I.
Z. t. atrigena Ripley & Hadden, 1982 – Bougainville I.



Descriptive notes. 20–23 cm. Nominate race has dark grey upperparts with black fringes, white spots on face, large white tips of wing-coverts forming two broad wingbars, white tips of rectrices; white below, with black scaling on sides and flanks; bill black, legs horn-coloured. Sexes similar. Juvenile undescribed. Race *atrigena* is distinctive, slaty-black above, with heavy black scalloping on flanks, wingbars less marked, legs dark grey. Voice. Undescribed.
Habitat. Montane mist-forest; recorded at 580–1430 m on New Britain, 1300 m on Umboi, and 1500 m on Bougainville.
Food and Feeding. Insects and other small animals. Forages on ground and in undergrowth.
Breeding. Mid-Feb in New Britain. Old records: moss nest, interwoven with fine rootlets; 2 eggs, pale bluish with tiny rufous spots. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in New Britain and New Ireland EBA and Solomon Group EBA. Very secretive and little recorded; may prove to be genuinely rare, and evidence suggests total population small. Only one record from Umboi I. Although montane forest in range appears secure, species may be susceptible to introduced mammalian predators, particularly owing to its terrestrial habits.
Bibliography. Clement & Hathway (2000), Coates (1990), Diamond (1976), Doughty *et al.* (1999), Dutson (2005c), Hadden (1981), Ripley & Hadden (1982), Schodde & Mason (1999), Stattersfield & Capper (2000).

132. San Cristobal Thrush

Zoothera margaretae

French: Grive des Salomon **Spanish**: Zorzal de San Cristóbal
German: San Cristobal-Erddrossel
Other common names: Makira Thrush

Taxonomy. *Turdus margaretae* Mayr, 1935, San Cristobal, 1900 feet [c. 580 m], Solomon Islands.
Belongs to a group, possibly a superspecies, which also contains *Z. dauma*, *Z. imbricata*, *Z. lunulata*, *Z. heinei*, *Z. machiki*, *Z. talaseae*, *Z. turipavae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. Often treated as conspecific with *Z. turipavae*. Has also been treated as a race of *Z. talaseae*, but this very inappropriate on basis of plumage. Monotypic.
Distribution. San Cristobal (Makira), in SE Solomon Is.



Descriptive notes. 23 cm; 60–71 g. Male is dark olive-brown above from crown to tail, with two narrow white-spotted wingbars on darker brown wing-coverts; brown-flecked whitish supercilium, face and throat, shading below to heavy brown scalloping on buffish-white ground, and becoming all buffy-white from lower belly to vent; bill blackish; legs pinkish-flesh. Female is like male, but has rusty tinge on lower belly and vent. Immature is like adult, with pale-spotted head, dark-scaled upperparts, browner underparts. Voice. Song a simple series of clicks, grates and whistles, often with long intervals between notes. Call a high-pitched very thin "tseeeep", also sharp "chik" and soft "chook"; loud wing-whirring in flight may be an alarm signal.
Habitat. Undergrowth of mid-montane ridge forest at 400–700 m, once at 200 m; preference for upper reaches of steep gulleys. Also in overgrown gardens.
Food and Feeding. Stomach contained earthy paste with small centipede and snail. Terrestrial.
Breeding. No information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Solomon Group EBA. Apparently fairly common at one site visited in recent years. Recently colonization of San Cristobal by the black rat (*Rattus rattus*) may pose a serious threat to this species, which is almost certainly highly terrestrial.
Bibliography. Buckingham *et al.* (1995), Cain & Galbraith (1956), Clement & Hathway (2000), Doughty *et al.* (1999), Dutson (2005c), Flannery (1995), Gibbs (1996), Hornbuckle (1999b), Mayr (1945), Schodde & Mason (1999), Stattersfield & Capper (2000).

133. Guadalcanal Thrush

Zoothera turipavae

French: Grive de Guadalcanal **Spanish**: Zorzal de Guadalcanal
German: Guadalcanal-Erddrossel

Taxonomy. *Zoothera margaretae turipavae* Cain and Galbraith, 1955, Turipava, 4100 feet [c. 1250 m], mountains of Guadalcanal, Solomon Islands.
Belongs to a group, possibly a superspecies, which also contains *Z. dauma*, *Z. imbricata*, *Z. lunulata*, *Z. heinei*, *Z. machiki*, *Z. talaseae*, *Z. margaretae*, *Z. monticola* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. Often treated as conspecific with *Z. margaretae*. Has also been treated as a race of *Z. talaseae*, but this very inappropriate on basis of plumage. Monotypic.
Distribution. Guadalcanal, in S Solomon Islands.



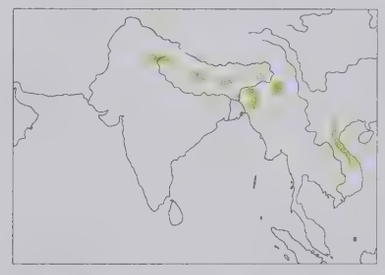
Descriptive notes. 20 cm. Male is dusky olive-brown above from crown to tail; has two very faint pale-spotted wingbars; brown-flecked whitish face and throat, shading below to heavy brown scalloping on buffish-grey ground colour, buffy flanks; bill small, blackish; legs dark brownish. Sexes apparently similar. Immature has pale shaft streaks above, browner wings, two orange-spotted wingbars. Voice. Song, regularly at dawn (moving songpost every few minutes), rarely in day, loud and melodic, a series of slurred whistles, short trills and repeated modulated whistles, with occasional call notes. Call a very thin high-pitched "tssss", occasionally lengthened into a hiss.
Habitat. Forest, at transition between montane forest and mossy forest (mist-forest); 1450–1500 m.
Food and Feeding. No information. Presumably forages largely on ground.
Breeding. No information.
Movements. Presumed sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Solomon Group EBA. Presumed to have very low total population of between 250 and 1000 mature individuals within its tiny range (97 km²). Recorded only three times, in 1953, 1994 and 1997, at type locality. Altitudinal range lies above areas of logging activity on Guadalcanal, but introduced mammalian predators, such as cats and rats, are known to be fairly common at high elevations on the island, and may well pose a serious threat. Research needed in order to determine if the species is more numerous and widespread than evidence to date suggests.
Bibliography. Clement & Hathway (2000), Dutson (2005c), Gibbs (1996), Stattersfield & Capper (2000).

134. Long-billed Thrush

Zoothera monticola

French: Grive montagnarde **German**: Bergdrossel **Spanish**: Zorzal Piquilargo
Other common names: Greater Long-billed/Large Brown/Brown Thrush

Taxonomy. *Zoothera monticola* Vigors, 1832, Simla–Almora area, Himalayas.
Belongs to a group, possibly a superspecies, which also includes *Z. dauma*, *Z. imbricata*, *Z. lunulata*, *Z. heinei*, *Z. machiki*, *Z. talaseae*, *Z. margaretae*, *Z. turipavae* and *Z. marginata*, perhaps including also *Z. mollissima* and *Z. dixoni*. Two subspecies recognized.
Subspecies and Distribution.
Z. m. monticola Vigors, 1832 – Himalayas E to Assam and NW Myanmar.
Z. m. atrata Delacour & Greenway, 1939 – NC Vietnam.



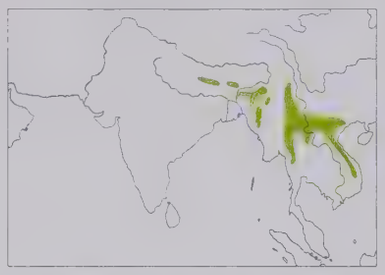
Descriptive notes. 26–28 cm; 115–131 g. A stout, massive-billed thrush. Nominate race is dark olive-brown with indistinct narrow blackish scalloping above, brown wings; crown and side of head flecked dull buff, with dark malar, whitish-buff chin and throat; dull grey-brown on breast and flanks, dark brown markings (and some whitish feathers) on breast, becoming sparser on dull buff background on upper flanks and belly side, with whitish belly to vent with grey-brown flecks and feathers; bill very long and partly hooked, dark; legs flesh-coloured. Sexes similar. Immature is darker with orangey shaft streaks above, spotted wingbars, more strongly spotted below. Race *atrata* is darker above and below than nominate. Voice. Song, produced only for short period (mostly less than 10 minutes) at dusk and dawn, a series of very rich, sweet, slow, wistful phrases, each of 3–6 downslurred whistles, e.g. "tsuweet-tsew-tsuw", last note lower and softest; also delivered with a single level or slightly trilled notes and occasional rasps, "weech-a-wee-wuu rrraee, ti, tuu preeyert, preeer trrray tya tyee". Alarm is a loud "zaaaaa".
Habitat. Breeds in undisturbed undergrowth of damp, shady forests of fir, bamboo and rhododendron, also broadleaf evergreen forest; requires places with moist earth, muddy sites, soft banks or thick layers of moss, thus especially along streams. At 2200–3800 m in Himalayas, wintering at 1000–2500; 900–2135 m in SE Asia.
Food and Feeding. Invertebrates; earthworm in one stomach. Forages amid damp leaf litter and open muddy patches of ground, searching for invertebrates by gouging and trowelling the substrate with its outsize bill, often flicking wings.
Breeding. May–Jul. Nest a bulky cup of vegetation, lined with fine fibres, placed 2–7 m up in tree fork or on branch. Eggs 3–4, pale green to grey-green or pale cream to warm buff, with reddish-brown speckles. No other information.
Movements. Generally sedentary, but with altitudinal movements in winter; some short local migration, but details unclear. Apparently non-breeding visitor in Bangladesh.
Status and Conservation. Not globally threatened. Previously considered Near-threatened. Still considered to be rare and local, even in most suitable habitat, in Nepal. Scarce in Myanmar and Vietnam.
Bibliography. Ali & Ripley (1987b), Ali *et al.* (1996), Clement & Hathway (2000), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Martens & Eck (1995), Martin (1919), Rasmussen & Anderton (2005), Robson (2000).

135. **Dark-sided Thrush**

Zoothera marginata

French: Grive à grand bec **German**: Langschnabeldrossel **Spanish**: Zorzal Flanquioscuro
Other common names: Dark-sided/Long-billed Ground-thrush, Lesser Brown Thrush

Taxonomy. *Z.(oothera) marginata* Blyth, 1847, Arakan, Myanmar.
Belongs to a group, possibly a superspecies, which also includes *Z. dauma*, *Z. imbricata*, *Z. lunulata*, *Z. heinei*, *Z. machiki*, *Z. talaseae*, *Z. margaretae*, *Z. turipavae* and *Z. monticola*, perhaps including also *Z. mollissima* and *Z. dixoni*. Monotypic.
Distribution. C Himalayas E, discontinuously, to Assam, Myanmar, NW Thailand, extreme S China (S Yunnan) and Indochina.



Descriptive notes. 24–25 cm; 81 g. A long-billed thrush with dark brown head contrasting with rufous-brown wings. Head to nape dark brown with buffy-white lores and eyering, blackish-flecked whitish submoustachial, cheeks and post-auricular mark, whitish chin and throat, rufous-brown on back and tail, more so on wings; breast with dense small greyish-brown scalloping on whitish background, markings becoming larger and looser farther back on underparts, duskier along flanks; bill blackish, pale lower mandible; legs flesh-coloured. Sexes similar. Immature is like adult, but lighter above, with black auricular stripe, orangey shaft streaks and spotted wingbars, pattern below less definite. Voice. Song a series of thin monotone whistles, softer and shorter than those of *Z. dauma* (race *aurea*), and downslurred. Calls include hard short "kluk" and deep soft guttural "tchuck"; alarmed juveniles gave "pit-pit-pit".
Habitat. Breeds in broadleaf evergreen forest, edge and bamboo, mainly in damp areas near shaded rocky streams, at 750–2100 m, in Himalayas; winters slightly lower in similar habitat, also in dense reeds inside forest, from plains to 1900 m. Occurs from plains to highest elevations in Thailand.
Food and Feeding. Invertebrates. Forages like *Z. monticola*. Mainly terrestrial. Forages especially in damp areas; uses bill to dig holes in wet earth and rotting ground vegetation.
Breeding. May–Aug throughout range; six juveniles in early Sept in N Thailand. Nest a neat mossy cup, lined with rootlets, placed up to 5 m above ground in tree. Eggs 3–4, off-white to pale grey or greyish-green with reddish-brown spots and blotches. No other information.
Movements. Resident, with slight seasonal altitudinal movements. Winter vagrant in Bangladesh.
Status and Conservation. Not globally threatened. Scarce to uncommon, but probably greatly overlooked owing to its cryptic plumage and behaviour. Scarce in Nepal; rare in China. Rare but fairly widespread in Myanmar; uncommon in Thailand; rare in Indochina.
Bibliography. Ali (1977), Ali & Ripley (1987b), Cheng Tsohsin (1987), Clement & Hathway (2000), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Wildash (1968).

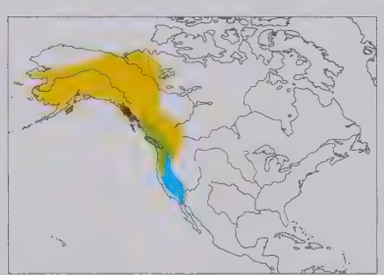
Genus *IXOREUS* Bonaparte, 1854

136. **Varied Thrush**

Ixoreus naevius

French: Grive à collier **German**: Halsbanddrossel **Spanish**: Zorzal Pinto

Taxonomy. *Turdus naevius* J. F. Gmelin, 1789, Nootka Sound, Vancouver Island, British Columbia, Canada.
Often placed in genus *Zoothera*, but plumage, apart from underwing pattern, very different. Geographical variation slight and mostly clinal; *carlottae* and *godfreii* possibly not tenable. Four subspecies recognized.
Subspecies and Distribution.
I. n. meruloides (Swainson, 1832) – Alaska and NW Canada; non-breeding also SW USA.
I. n. naevius (J. F. Gmelin, 1789) – SE Alaska S to NW California.
I. n. carlottae (A. R. Phillips, 1991) – Queen Charlotte Is, in British Columbia (SW Canada).
I. n. godfreii (A. R. Phillips, 1991) – interior British Columbia S to NW USA (Idaho, Montana).



Descriptive notes. 21·5–24 cm; 65–100 g. Slaty and orange plumage, in complex pattern. Male nominate race is mainly slate-grey above (blue-tinged when breeding), with orange postocular supercilium, double wingbar and flashes in folded flight-feathers, blackish face; below, dull orange from upper submoustachial line to mid-belly, with broad blackish breast-band, broad mid-grey scaling on flanks, shading to grey and then white on vent; bill blackish; legs pink to flesh-coloured. Rare grey morph has slaty areas replaced by mid-grey, orange areas by white. Female is like male, but slaty-brown instead of slate-grey, orange paler, breastband much paler. Juvenile is like adult, but with vague orange-buff streaks above, indistinct dark marking across breast. Race *meruloides* is shorter-winged, female paler above and below; *godfreii* is intermediate between previous and nominate; *carlottae* female is tinged tawny above, with paler crown, paler-edged tail. Voice. Song, mainly Mar–Aug, chiefly Apr–Jun (occasionally in winter), mostly early morning and evening, consists of eerie series of long-drawn, slightly quavering, even-pitched whistles, each on different pitch (some notes trilled and buzzy), each 1·5–2 seconds long, with pauses of 3–20 seconds between them, delivered over 10–15 minutes from top of large living conifer, typically on steep slope amid dense trees; up to seven different songs used in one study, and sung in complex sequence, possibly to reduce habituation by neighbouring conspecifics. Calls include short dry "chup", hard high "gipf", soft short "tiup", with flight call a short humming whistle; in aggressive interactions in winter a trilled "whirrr" or "vree", a quavering, eerie "wheeeirr", and harsh "churrr"; in response to disturbance also a series of 5–7 low "chect" notes, and (by female disturbed on nest) a low "chuk".
Habitat. Dark, wet conifer forest with shaded mossy floor, with various combinations of dominant trees such as sitka spruce (*Picea sitchensis*), western hemlock (*Tsuga heterophylla*), western red cedar (*Thuja plicata*), douglas fir (*Pseudotsuga menziesii*), western larch (*Larix occidentalis*), coastal redwood (*Sequoia sempervirens*), red alder (*Alnus rubra*) and balsam poplar (*Populus balsamifera*), understorey of shade-tolerant shrubs and moss-covered substrate; 0–2000 m in S and 0–1200 m in N of range. Generally commoner in wetter habitats than in drier ones, and in mature and old-growth stands than in younger forest (although latter circumstance not apparent in SE Alaska). Fragments smaller than 16 ha in California rarely occupied. Migrants use same habitat, exploiting areas with rich fruiting plants. In winter some enter parks and gardens; in interior British Columbia many occupy dry lakeshores in madrone (*Arbutus menziesii*) woodland, and in douglas fir forests in California abundance greater in recent clear-cut areas (1–7 years old) than in old-growth areas; in S portions of winter range, commonly uses dense oak woodland, especially in ravines and canyons, and tall chaparral. In winter, NW Mexico, conifer forests and mixed woodland from sea-level to 2500 m.
Food and Feeding. Mainly terrestrial invertebrates in spring and summer; mainly fruit, berries and mast in autumn and winter. Rarely, cultivated fruit and peas. No summer data on invertebrate composition; berries, including red huckleberry (*Vaccinium parvifolium*), thimbleberry (*Rubus parviflorus*) and salmonberry (*R. spectabilis*), incorporated into diet by Jun. In winter, acorns, fruit, berries, seeds and nuts predominated in 58 stomachs, main items acorns (*Quercus*), snowberry (*Symphoricarpus racemosus*), apple (*Pyrus malus*) and California honeysuckle (*Lonicera hispidula*), and in same sample 26% of items invertebrates, including beetles, ants, millipedes, caterpillars, grasshoppers, bugs, flies, earthworms, snails and sowbugs (Isopoda). Acorns and other mast important in autumn, once comprising 77% of diet in Nov, while tanoak (*Lithocarpus densiflora*) and madrone berries key winter foods in douglas fir forest in NW California. Also in winter, fruits or berries of dogwood (*Cornus*), cascara (*Rhamnus purshiana*), ash (*Fraxinus texensis*) and salal (*Gaultheria*) taken in British Columbia; berries of mistletoe (*Phoradendron*), manzanita (*Arctostaphylos mariposa*), toyon (*Heteromeles arbutifolia*) and creek dogwood (*Cornus stolonifera*) in Yosemite area of California. Frequently forages on earthworms along paths and roadsides, sometimes lawns. Forages in summer mainly on ground in shady areas, removing litter with several sideways tosses; much less commonly on logs or on trees or snags. When taking fruit, hops from branch to branch, gleaning (sometimes hover-gleaning) items from twigs. In winter, Mexico, forages on ground and in bushes and trees.
Breeding. Apr–Aug; probably double-brooded. Territory probably c. 7 ha; evidence suggests internest distance not closer than 300 m. Nest an open cup with coarse outer layer of twigs and sometimes leaves, lichen and bark, dense middle layer of rotten wood and moss, sometimes with mud and wet grass, fine-woven lining of grasses, soft leaves and moss; placed (often near old nests) usually in understorey on branches close to trunk of small conifer, also on ground, in shrub or vine, and near end of branches of large conifer. Eggs 1–6, mainly 3–4 (3 along coast, 4 in interior), pale blue usually with sparse small dark brown spotting; incubation period in one instance 12 days; nestling period 13–15 days; post-fledging dependence unknown. Brood parasitism negligible. Of 15 nests in study in Alaska and adjacent Canada, 55% survived to fledging stage; in another study, two out of seven nests in British Columbia fledged young; nest predation by red squirrels (*Tamiasciurus hudsonicus*) may be extensive, with lesser impacts from Steller's Jay (*Cyanocitta stelleri*) and Grey Jay (*Perisoreus canadensis*); in experimental study, predation much greater along edges than in interior of forest, perhaps explaining lower abundance of species in edge habitat and absence from woodlots smaller than 16 ha. Breeds at 1 year of age. Oldest recorded bird less than 5 years old.
Movements. Poorly studied. In S of range variable from year to year, with erratic irruptive pattern, and some wandering widely. Some evidence that N breeding populations "leapfrog" over C & S ones to winter farthest S, but in general moves locally in short-distance, partial and elevational (nocturnal) migrations; some individuals sedentary. Throughout range most numerous along immediate Pacific coast. Timing of movements of coastal race *naevius* difficult to gauge, owing to high proportion of residents in some areas; in autumn, departs NW Sept–Oct and from British Columbia by Nov, arriving in California Oct; in Alaska spring return late Mar to late Apr, in N British Columbia increase from early Apr and peak mid-Apr to early May. In race *meruloides*, clearer distinction between breeding and wintering sites: begins departing NW of range late Aug and early Sept, passage through British Columbia over by end Oct, arrival in far S part of wintering range mid-Oct to Nov, sometimes remaining there to Apr; main spring movement in British Columbia mid-Apr to late Apr, and in Oregon late Mar and Apr. Occasional irruptions occur on ESE path from NW of range (therefore probably involving *meruloides*), 80% of individuals appearing in Nov–Jan. Uncommon to rare winter visitor to NW Mexico, Nov–Mar. Vagrants have appeared twice in W Europe: in Iceland (May) and SW England (Nov).
Status and Conservation. Not globally threatened. Fairly common. Abundance tends to be cyclical, with peaks every 2–5 years (possibly correlated with cycles in abundance of acorns). Analysis of data 1966–1994 suggests no significant change in abundance over whole range or in any portion; but more recently data from 1980–1996 suggest significant decline in USA and negative trends throughout range, with strongest fall in Idaho (7·1%) and Washington (4·2%). Logging and fragmentation of mature and old-growth forests may have contributed to declines. Species may, however, benefit from establishment of late-seral reserves for Spotted Owl (*Strix occidentalis*) in NW USA. Small breeding population discovered in 1991 in San Mateo Mts (California), probably newly established (given lack of earlier records). Feral cats may cause heavy mortality in winter, and many migrants die by flying against windows; main natural cause of mortality appears to be severe winter weather.
Bibliography. Anon. (1998b), Beal (1915), Beck & George (2000), Bent (1949), Clement & Hathway (2000), Friedmann *et al.* (1957), George (2000), Godfrey (1986), Grinnell (1901), Grinnell & Miller (1944), Hagar (1960), Howell & Webb (1995), Hurt (1996), Keith, A.R. (1968), Keith, S. (1968), Kessel (1998), Law (1931), Madge *et al.* (1990), Martin (1970), McNicholl (1978), Phillips (1991), Ransom (1949), Root (1988), Sibley (2000), Svingen (1995), Wells *et al.* (1996), Whitney (1981a, 1981b).

Genus *RIDGWAYIA* Stejneger, 1883

137. **Aztec Thrush**

Ridgwayia pinicola

French: Grive aztèque **German**: Aztekendrossel **Spanish**: Zorzal Azteca

Taxonomy. *Turdus pinicola* P. L. Sclater, 1859, pine forests of tableland above Jalàpa, Veracruz, southern Mexico. Often placed in genus *Zoothera*, but plumage, apart from underwing pattern, very different. Two subspecies recognized.

Subspecies and Distribution.
R. p. maternalis A. R. Phillips, 1991 – SW Chihuahua to S Jalisco, in NW Mexico.
R. p. pinicola (P. L. Sclater, 1859) – SW Mexico (Veracruz and Michoacán to S Guerrero and S Oaxaca).



Descriptive notes. 21·5–24 cm; 67–88 g. Male nominate race is brown with dark brown streaks (and pale buff shaft streaks) above and down to upper belly; uppertail-coverts white, tail blackish with broad white tips; folded wing with complex pattern of broad buff, black and white bands and flashes; belly to vent white; bill black; legs pale pink. Female is very similar, but paler above and on breast with more obvious streaking, washed buff on lower underparts. Juvenile has basic adult wing and tail patterns, but covered in bold yellowish to golden streaks and black scaling. Race *maternalis* female is sootier, darker and greyer on rump and chest, yielding stronger contrast with white belly. Voice. Apparent song a louder variation of main call, repeated steadily by male, "wheeerr, wheeerr, wheeerr". Call a quavering, slightly burry, whining "wheeerr", "prreep" or "zrrip", rather metallic whining "whein" or soft upslurred "seeeep", and a nasal to clear "sweee-uh" or "tlee-zip" in alarm.
Habitat. Humid pine, pine–oak and pine–evergreen forest, at 1800–3500 m; mostly in forested ravines and damp hollows.
Food and Feeding. Invertebrates, including terrestrial insects and their larvae; also small fleshy berries and fruit of woody plants such as Texas madrone (*Arbutus texana*), manzanita (*Arctostaphylos pungens*), grapes (*Vitis arizonica*), cultivated *Pyracantha coccinea* and, when previous foods exhausted, hackberry (*Celtis reticulata*). Forages mainly in bushes and trees, but also on ground; seen to feed in epiphytes and on moss-covered and fern-covered branches of tall oaks in deep ravines. Forms small foraging flocks at times; sometimes joins mixed-species flocks.
Breeding. May–Jul; single breeding record in Sonora, in Aug–Sept. Nest a cup of grass, leaves and moss, placed 5–20 m up inside epiphyte on limb of tall tree in steep wet ravine. Eggs 2 (but three young seen with female), plain pale blue. No other information.
Movements. Basically resident; extreme N populations may shift S in winter, Oct–Feb, but present all year at least in Sinaloa. Rare accidental in extreme S USA and NE Mexico.
Status and Conservation. Not globally threatened. Uncommon to fairly common. Very uncommon in interior Oaxaca.
Bibliography. Anon. (1998b), Binford (1989), Clement & Hathway (2000), Friedmann *et al.* (1957), Howell & Webb (1995), Phillips (1991), Rowley (1966), Russell & Monson (1998), Schaldach (1963), Sibley (2000), Zimmerman (1991).

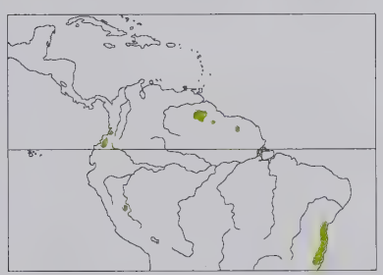
Genus *CICHLOPSIS* Cabanis, 1851

138. **Rufous-brown Solitaire**

Cichlopsis leucogenys

French: Grive roux-brun **German**: Rotrückenklarino **Spanish**: Solitario Ocre
Other common names: Guyanan Solitaire (*gularis*)

Taxonomy. *C.*(*ichlopsis*) *leucogenys* Cabanis, 1851, Brazil.
Has been treated in genus *Myadestes*, but very different vocally and in plumage. Geographical variation fairly strong, and vocal evidence may reveal that one or more of the races would be better treated as full species. Four subspecies recognized.
Subspecies and Distribution.
C. l. gularis Salvin & Godman, 1882 – SE Venezuela, Guyana and Suriname.
C. l. chubbi Chapman, 1924 – SW Colombia and NW Ecuador.
C. l. peruviana Hellmayr, 1930 – C Peru.
C. l. leucogenys Cabanis, 1851 – E Brazil (Bahia, Espírito Santo).



Descriptive notes. 20–21 cm; 45–61 g. Rather featureless thrush. Nominate race is rufous-brown all over, shading buffier on breast and then paler and greyer on belly, with dull buff vent and whitish underwing-coverts; throat cinnamon; bill and legs dull yellowish-brown. Sexes similar. Juvenile has light buff streaking above, buff spotting on wing-coverts. Race *gularis* is olive-tinged on breast and on throat side, with central chin to throat diffuse buffy-orange, belly dull whitish, vent ochraceous, underwing-coverts greenish-buff; *chubbi* is slightly larger, richer brown from head to back, shading more chestnut on rump, with chin and throat diffuse rich chestnut, shading to rufous-olive on upper breast, more olive on lower breast, warmer rufous belly and foxy buffy-orange vent, underwing-coverts orange-buff; *peruviana* is like previous above, but with paler orange-buff throat bordered slightly darker, vent not so foxy, legs olive-grey. Voice. Song, apparently very seasonal, and mainly early in morning, a series of complex, rapid, variable phrases, fairly musical but with some squeaky, chattering, twittering, buzzing and trilled notes, e.g. "tliiowít-tsiii-trrrrr-tr-tr-tiio"; very different from *Myadestes*, more like *Turdus flavipes* or a thrasher (*Toxostoma*) or catbird (*Dumetella*). Calls include high, very thin "iiiiiiiiii", weak or loud, often given at intervals of 3–5 seconds for a minute or more, recalling fruiteater (*Pipreola*); harsh guttural call when disturbed.
Habitat. Humid and wet, typically mossy lower montane (foothill) forest and dense second growth; mainly 500–1300 m in main Andes; 900–1450 m in Venezuela, but down to 400 m in Nov; 750–850 m in Brazil.
Food and Feeding. Fruit; presumably some invertebrates. Alternates periods of quiet perching with bouts of active foraging at fruiting trees and shrubs, especially Melastomataceae along forest borders, particularly when mixed-species flocks present. Forages also in leaf litter and undergrowth.
Breeding. Jun–Jul in Colombia. Nest (Colombia) 5 m up in dense second growth on edge of small forest clearing; cup nest in fork of branch in Brazil. No other information.
Movements. Possibly some local movements. In Ecuador, record at Playa de Oro (Esmeraldas) in Feb was considered to refer to non-breeding visitor; also, seasonal altitudinal movements indicated by occasional records down to 100 m in NW Ecuador. In Venezuela, occasional relative commonness suggests short-distance seasonal or altitudinal movements, but evidence too sparse.
Status and Conservation. Not globally threatened. Formerly considered Near-threatened, and possibly merits re-listing as such. Remarkable distribution and very small range of each race indicate a relict species; strong consideration in national conservation planning (as suggested for Ecuador) well deserved. Fairly common in Brazil in a few areas, e.g. in Nova Lombardia Reserve (Espírito Santo). Rare to uncommon in Venezuela, where red-listed as "Insufficiently Known", but occasionally fairly common for short periods, suggesting local movements; fairly common and on upper Escalera road (in E Bolívar). Scarce and very local in NW Ecuador, but fairly common at El Placer (Esmeraldas); not known to occur in any protected area.
Bibliography. Chapman (1926), Clement & Hathway (2000), Donahue & Pierson (1982), Haverschmidt & Mees (1994), Hilty (2003), Hilty & Brown (1986), Phelps & Phelps (1950), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Rodríguez & Rojas-Suárez (1995), Sick (1985, 1993).

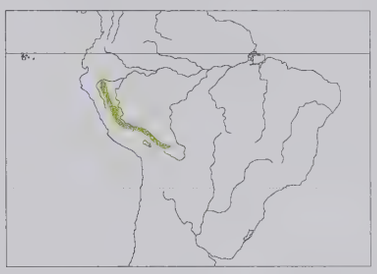
Genus *ENTOMODESTES* Stejneger, 1883

139. **White-eared Solitaire**

Entomodestes leucotis

French: Grive oreillarde **German**: Weißohrklarino **Spanish**: Solitario Orejiblanco

Taxonomy. *Ptilogonys leucotis* Tschudi, 1844, Peru. Monotypic.
Distribution. N Peru S to C Bolivia.



Descriptive notes. 22–24 cm; 58 g. Male has large white patch on lower face (submoustachial to ear-coverts) separating black of head from black of underside; nape to uppertail-coverts and upperwing-coverts rich chestnut, some white in carpal area; flight-feathers blackish, tail blackish with outer feathers distally white; broad white bar on underwing; iris variably red to brown; bill black, yellow lower mandible; legs blackish. Female is similar to male, but browner on crown, and underparts shot with brown. Immature is very similar, but with buff streaking on crown and nape, legs yellowish. Voice. Song, from concealed perch, a strange, very high-pitched, ringing, almost nasal "wreeeeeeenh", weak yet far-carrying, repeated every 7–8 seconds or so.
Habitat. Middle strata of humid premontane and montane forest and cloudforest, and forest borders; 900–3350 m, mostly 1500–2800 m.
Food and Feeding. Berries and other fruits, also seeds and insects. Forages in trees. Sometimes in loose groups; also joins mixed flocks.
Breeding. Fledglings in Oct in Bolivia and Nov in Peru. No other information.
Movements. Sedentary, so far as is known.
Status and Conservation. Not globally threatened. Fairly common, at least locally, in suitable habitat over much of range. Probably greatly under-recorded owing to highly unobtrusive behaviour; presence determined by distinctive call, indicating that it is less uncommon than previously believed.
Bibliography. Clement & Hathway (2000), Clements & Shany (2001), Fjeldså & Krabbe (1990), Ridgely & Tudor (1989), Walker (2001).

140. **Black Solitaire**

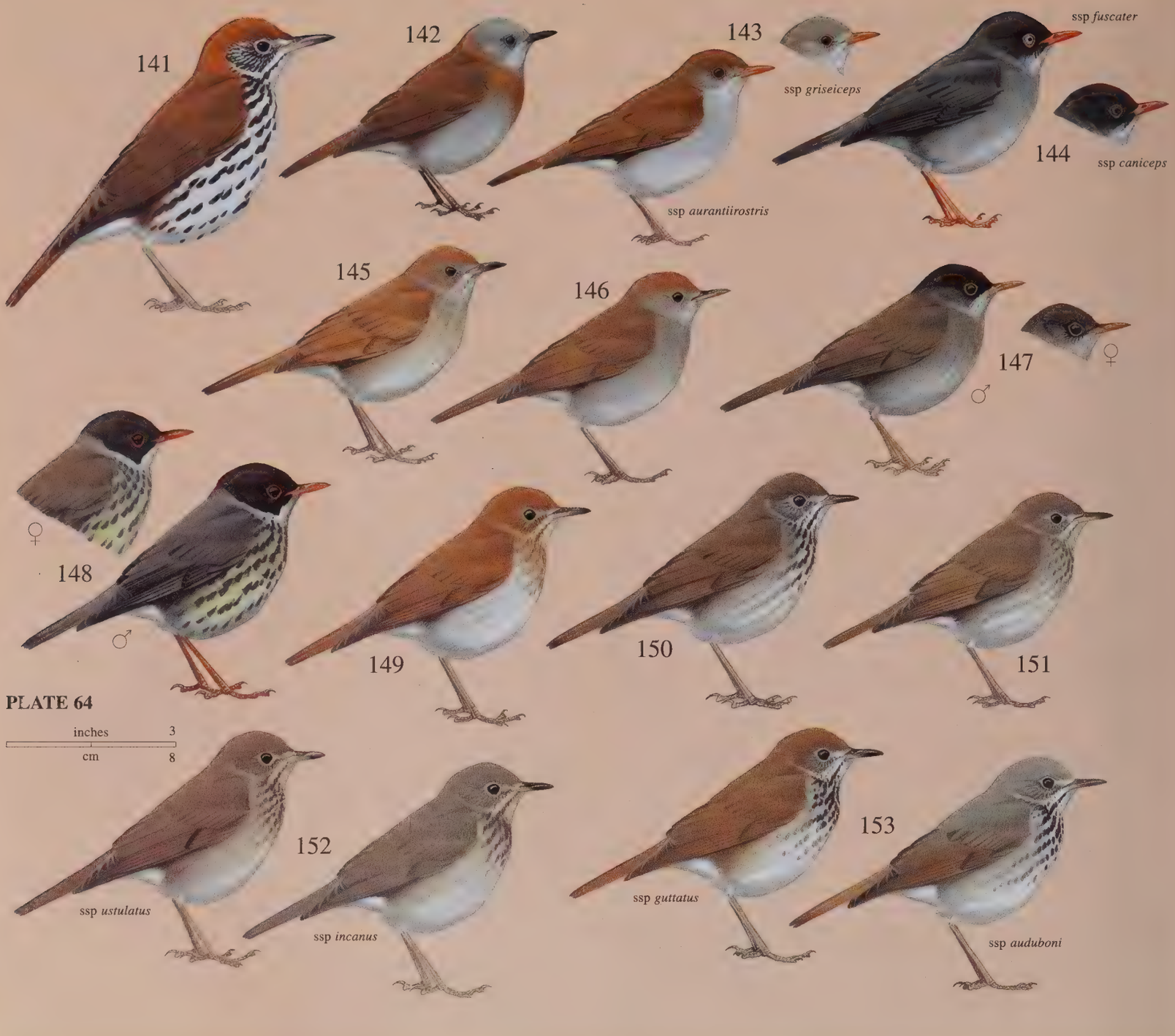
Entomodestes coracinus

French: Grive coracine **German**: Schwarzklarino **Spanish**: Solitario Negro

Taxonomy. *Myiadestes coracinus* Berlepsch, 1897, near San Pablo, Túquerres Province, southwestern Colombia. Monotypic.
Distribution. W Colombia and NW Ecuador.



Descriptive notes. 23 cm. Male almost entirely black, with large white patch on lower face (submoustachial to ear-coverts); flight-feathers blackish, some white in carpal area; tail blackish with outer feathers distally white; iris red; bill black, orange lower mandible; legs blackish. Sexes similar. Immature has pale shaft streaks on scapulars and spots on wing-coverts. Voice. Song a weak yet far-carrying, high, buzzy, nasal "wreeeeeeenh", lasting just over 1 second, very similar to that of *E. leucotis*. Call a much weaker "tseeu".
Habitat. Wet, mossy subtropical cloudforest, foothill forest borders and tall second growth, using strata from understorey to subcanopy; mostly 600–1900 m, but 1100–1600 m in Ecuador. In areas with little moss growth, species appears to be absent or, at best, seasonal.
Food and Feeding. Fruits, including berries smaller than 10 cm, such as *Miconia* (e.g. *M. theaezans*) and *Henriettella*. Small numbers sometimes gather at such fruiting shrubs; may join mixed-species flocks.
Breeding. Jul in Colombia. Nest an open cup of fresh moss, lined with brownish rootlets, in two cases placed 3·5 m up in tree-fern (*Cyathea*) and 1·7 m up on vertical stems of aroid (*Monstera*) attached to tree trunk. Eggs 2, glossy pale green with fine brown spotting. No other information.
Movements. Apparently makes altitudinal or local movements in Colombia; recorded in Valle only in May–Jun and Oct–Nov.
Status and Conservation. Not globally threatened. Restricted-range species: present in Chocó EBA. Uncommon to locally fairly common in Colombia; only one locality known (in 1980s), above Junín (in W Tumaco), where numerous. Rare to locally uncommon in Ecuador, where seems fairly sensitive to habitat disturbance and fragmentation.
Bibliography. Beltrán (1992), Butler (1979), Clement & Hathway (2000), Hilty (1977), Hilty & Brown (1986), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Salaman (1994).



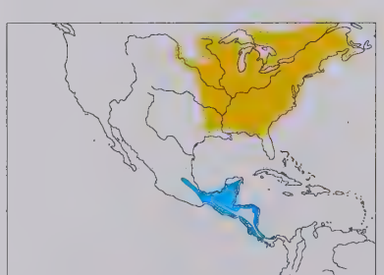
Genus *HYLOCICHLA* S. F. Baird, 1864

141. Wood Thrush

Hylocichla mustelina

French: Grive des bois **German**: Waldrossel **Spanish**: Zorzalito Maculado

Taxonomy. *T.(urdus) mustelinus* J. F. Gmelin, 1789, New York, USA.
Generic placement of species unstable over past half-century. Has been thought close to *Turdus*, but latest evidence suggests that treatment in *Catharus* may be appropriate. In past, present genus was sometimes broadened to include five species of *Catharus*. Monotypic.
Distribution. SE Canada and E USA; non-breeding E Mexico and Central America.
Descriptive notes. 18–21·5 cm; 40–72 g. Slightly larger and stockier than *Catharus* thrushes. Has rufous-brown crown, nape and neck side, shading to mid-brown upperparts; distinct pale lores and eyering, cheeks stippled black and white; whitish below, bold blackish spots from breast to flanks; bill blackish above, mostly pink on lower mandible; legs pinkish. Sexes similar. Juvenile lacks rufous, has similar spotting below, buff streaking above. Voice. Song, mainly before dawn and in early morning, by male from leafless limb often high in tree, a series of clear, fluty phrases each having three parts, these variable both internally and in sequence and presence: first part (A, usually inaudible) a short low quiet set of 2–6 notes, "bup bup bup", second (B) a set of 2–10 (mainly 3–5) clear flute-like notes, "iolay-lay-lay", third part (C) a rapid trill; can thus sing e.g. CCCBA, AC, CCC, etc. Song given before migration on wintering grounds, but at greatest intensity on breeding grounds in first half May (dwindling rapidly from Jun). Calls include low clucking "bup bup bup" or "whe-whe-whe-wheh" in mild agitation or for contact, becoming rapid mellow liquid "whiu-whiu-whiut" or "whi-whi-whi-whuit", commonly heard at dawn and dusk; also nasal rattling "trrrr, trrrr", single "quert", plaintive "whew" during nest defence and single high "tsiii" near nest; flight call a sharp nasal "jeeen".



Habitat. Breeds in interior and edge of wide variety of deciduous and mixed forests in which primary features are moderate shrub/subcanopy layer with fairly open forest floor, shade, moist soil and decaying leaf litter, with common tree species American beech (*Fagus grandiflora*), sweet gum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*), eastern

hemlock (*Tsuga canadensis*), flowering dogwood (*Cornus florida*), American hornbeam (*Carpinus caroliniana*), oaks (*Quercus*) and pines (*Pinus*), and common shrubs including arrowwood (*Viburnum*), spicebush (*Lindera*), pepperbush (*Clethra*), blueberry (*Vaccinium*) and rhododendron; favours mature mesic upland forest. Juvenile post-dispersal home ranges in different habitats, characterized by dense understorey and thick ground cover. On passage probably mainly second growth and forest edge where fruit available. In winter in Middle America, mainly in interior understorey of humid to semi-humid broadleaf evergreen and semi-deciduous forest and mixed palm forest, also forest edge, second growth and Guatemalan *bajo* forest (open-canopy, low-stature forest with dense shrubs). In Costa Rica, forest undergrowth, low moist thickets, banana and old cacao plantations, to 1400 m on Atlantic slope and to 1700 m on Pacific slope; mist-net captures commonest in open understorey of primary forest and in well-developed understorey of old second growth.

Food and Feeding. Mainly soil invertebrates, with considerable fruit from late summer to early spring; tends to shift from canopy-shaded litter-rich areas in summer to forest gaps with fruiting shrubs in autumn. Main animal prey comprises larval and adult beetles, flies, hymenopterans, lepidopterans, millipedes and isopods. Of 179 stomachs, mainly May and Jul, 62% held animal matter, 38% vegetable, with 11% lepidopterans, 8% spiders, 4% beetles and 2% grasshoppers; of 329 items from 60 summer birds, 33% adult beetles, 18% flies, 17% hymenopterans (mostly ants), 12% lepidopterans (mostly caterpillars), and 10% centipedes, millipedes and molluscs. Fruits taken on breeding grounds include spicebush, blueberry, dogwood, black gum, grape (*Vitis*), cherry (*Prunus*), pokeweed (*Phytolacca*), elderberry (*Sambucus*), holly (*Ilex*), jack-in-the-pulpit (*Arisaema*) and Virginia creeper (*Parthenocissus*). Nestling diet soft-bodied invertebrates and mandibulated fruit; includes ants, spiders, cantharid beetles, earthworms and millipedes by days 7–9. Of 26 stomachs in winter (Mexico), 16 held arthropods, eleven fruit seeds and five fruit; of 259 faecal samples in winter (Costa Rica), 93% contained insects and 59% seed or pulp of 750 fruit taxa (especially *Clidemia densiflora*, *C. subcrustula*, *Henrietta tuberculosa*, *Miconia simplex*, *M. smaragdina* and *Psychotria pittieri*). Elsewhere in Costa Rica, diet recorded as insects, spiders, earthworms and other litter invertebrates, much fruit; fruit-eating increases prior to migration. Sometimes follows army-ant swarms. Forages on ground and logs, probing in earth, gleaning bark and leaves, tossing aside leaf litter; occasionally hovers for fruit or hawks for insects. Some individuals hold winter territories, average 0·5 ha in Veracruz (Mexico); territory-holders eat mainly arthropods and occasionally snails. Others "float", often in groups, on winter grounds.

Breeding. Early May to late Aug; two broods typical (minimum 74% in one study, Ontario), three broods rare. Apparently monogamous, rare instances of polygyny (bigamy); pair-bond usually lasting for single season. Territory 0·08–2·8 ha. Nest a cup of dead grass, stems and leaves, layered with mud, lined with rootlets, placed usually in fork of tree or shrub mainly below 6 m, in one area mean 3 m; in one study, nest-sites characterized by dense overstorey and moderately developed understorey; distances moved between nesting attempts (successful or not) 1 m to more than 17 km. Eggs 3–4, plain turquoise-green; incubation period 13 (11–14) days; nestling period 12–15 days; post-fledging dependence c. 10–20 days, first brood attended 13 days by female before second clutch begun, male continuing to tend first brood for further 6 days; last broods of year divided between male and female. Brood parasitism by Brown-headed Cowbird (*Molothrus ater*) often extensive (100% in some areas in Midwest), but pattern variable, and evidence suggests that effects generally slight; in one study, parasitized females fledged as many young in a year as did unparasitized females, because of renesting when parasitism levels lower. In study in fragmented suburban woodland in coastal E USA (Delaware), 73% of eggs hatched, 69% of chicks fledged, 63% of nests fledged at least one young, fledglings per nest 1·6, per successful nest 2·6; corresponding figures from study in continuous woodland in Great Smoky Mts (Tennessee–North Carolina) 55%, 72%, 44%, 1·5, 3·4; in substudy in Delaware, females in small woodlots (less than 2·5 ha) produced only half as many fledglings per year as did those in main study area; breeding success in Ohio greater for nests higher off ground and in areas with lower densities of shrubs and saplings. Nest predation appears a major constraint on populations in continuous forest; predators are snakes, corvids, raptors, rodents and carnivorous mammals, including black bears (*Ursus americanus*), but recent study found that southern flying squirrel (*Glaucomys volans*) causes most nest losses; in fragmented landscape in Illinois, combination of nest predation and cowbird parasitism makes area a regional "sink" (population probably maintained only by immigration). Oldest recorded individual 8 years 11 months.

Movements. Long-distance nocturnal migrant, travelling on average 2200 km. Leaves N breeding areas mid-Aug to mid-Sept, peak passage Sept to early Oct in Delaware, late Sept to early Oct in Florida and Alabama; crosses Gulf of Mexico on broad front extending from Texas to Florida, with landfall from Veracruz (Mexico) S to Costa Rica. Present Middle America late Aug to Apr, and passage migrant late Aug to Oct and Apr to mid-May, but most arrivals in winter quarters Oct, with passage through Veracruz Nov. Dates of records in El Salvador Oct–Nov and Jan–Feb and Apr; in Costa Rica main passage late Sept to mid-Nov and Mar–Apr, but spring migration much lighter (scarcely noticeable, except along Atlantic coast). In Panama, winter residency mostly mid-Oct to mid-Apr. On spring passage, involving NE sea crossing on front from Veracruz and Yucatán, typically arrives S USA first week of Apr, with peak in second half Apr, but peak arrival in N (Minnesota E to Maine) in second half May. Rare migrant and winter visitor in Caribbean, passage dates mid-Sept to Nov and Mar–Apr (from Feb in Cuba). Extralimital records frequent, extending E to Pacific coast of North America; vagrants recorded in South America (Colombia) and Europe.

Status and Conservation. Not globally threatened. Common. Breeding densities variable, 0·1–0·5 pairs/ha in some areas, 0·6–1/ha in others, and even 1·5–2/ha in presumably optimal conditions. Population in Great Smoky Mountains National Park estimated at 10,000 pairs, and producing c. 3000 surplus female young each year, thus acting as major "source" area for the species. In primary forest in winter densities may be higher, up to 8·2 birds/ha (but this value may be comparable with breeding-ground density in post-fledging period). In winter, Middle America, fairly common to common on Atlantic slope, considerably sparser on Pacific slope; possibly relatively frequent in El Salvador. Common in wooded areas in Belize, Oct to mid-Apr, and fairly common in same period Honduras. Uncommon to fairly common in Costa Rica; rare to uncommon winter visitor in Panama, most numerous in Bocas del Toro. Significant decline throughout breeding range of 1·7% per year over period 1966–1994, although trajectory not steady; no change 1966–1979, 4% decline 1978–1988, and 13·6% increase 1989–1990. Winter populations in Tuxtla Mts (Mexico) in 1985 estimated to be only 30% of those in 1960 and 15% of those in AD 1500, owing to forest loss. Destruction and fragmentation of forests in both breeding and wintering ranges appear to influence populations negatively; pairs in small fragments and in fragmented landscapes suffer elevated nest predation and brood parasitism, thus have depressed reproductive output. Acid rain also shown to have adverse effects, through leaching out of the soil the calcium required for production of viable eggs. Management of forest for Red-cockaded Woodpecker (*Picoides borealis*) involving prescribed burning and forest-thinning has no detectable effect on present species. Key conservation measure in both breeding and non-breeding quarters is habitat management on landscape scale through preservation of stands of primary and old secondary forest, especially those larger than 1 km². Restoration of native plant communities may benefit this species and *Turdus migratorius*; although both utilize exotic plants (e.g. *Lonicera*) for nesting, lower height and absence of thorns of these plants result in greater nest losses.

Bibliography. Able *et al.* (1984), Amos (1991), Anders, Dearborn *et al.* (1997), Anders, Faaborg & Thompson (1998), Anon. (1998b), Artman & Downhower (2003), Bent (1949), Bertin (1977), Binford (1989), Blake & Loiselle (1992a, 1992b), Bond (1956b, 1979), Borror & Reese (1956b), Brackbill (1943, 1958), Bradshaw & Dowdall (1993), Brown & Roth (2002, 2004), Canevari *et al.* (1991), Carrie (1999), Clement & Hathway (2000), Conway *et al.* (1994a, 1994b), Cooper (1975), Cramp (1988), Davis (1971), DeGraaf & Rappole (1995), Dilger (1956a, 1956b), Dobson & Lemon (1979), Donovan *et al.* (1995), Farnsworth & Simons (1999, 2000), Fauth (2000, 2001), Friedmann *et al.* (1957), Friesen, Cadman & Allen (2001), Friesen, Cadman & MacKay (1999), Friesen, Wyatt & Cadman (1999a, 1999b), Friesen, Wyatt, Cadman, MacKay *et al.* (2000), Galindo *et al.* (1963), Garrido & Kirkconnell (2000b), Gibson *et al.* (1976), Godfrey (1986), Graber *et al.* (1971), Hames *et al.* (2002), Hendrickson & Yow (1973), Hilty & Brown (1986), Holmes & Robinson (1988), Holmes & Sherry (1988), Hoover & Brittingham (1993), Hoover *et al.* (1995), Hoppes (1987), Howell & Webb (1995), Hughes (1977), Ivor (1952), James *et al.* (1984), Johnson, M.S. (1997), Johnson, R.K., Roth & Paul (1990), Johnson, R.K., Roth, Kleiner & Bartlett (1991), Land (1970), Lang, Powell *et al.* (2002), Lanyon (1979), Lee Jones (2004), Loiselle & Blake (1990), Longcore & Jones (1969), Malmborg & Wilson (1988), Monroe (1968), Morse (1971), Murray (1997), Nolan (1974), Noon (1981), O'Reilly (1996), Perkins *et al.* (2004), Petit *et al.* (1992), Phillips (1991), Powell, Krementz *et al.* (1998), Powell, Lang *et al.* (2000), Quay (1986), Raffaele *et al.* (1998), Rappole & Warner (1980), Rappole, Morton & Ramos (1992), Rappole, Ramos & Winker (1989), Ridgely & Gwynne (1989), Rivera, Haas *et al.* (2000), Rivera, McShea *et al.* (1999), Rivera, Rappole *et al.* (1998), Robbins *et al.* (1989), Robinson *et al.* (1995), Rodríguez (1982), Roth (1987), Roth & Johnson (1993), Roth *et al.* (1996), Russell (1964), Sadler (1987c), Sargent *et al.* (2003), Saunders (1961), Schmidt & Whelan (1999), Sibley (2000), Simons *et al.* (2000), Slud (1964), Smithe (1966), Stein (1956), Stiles & Skutch (1989), Suthers (1993), Terres (1962), Thurber *et al.* (1987), Trine (1998), Underwood & Roth (2002), Vega Rivera, Haas *et al.* (2000), Vega Rivera, McShea *et al.* (1998, 1999), Vega Rivera, Rappole *et al.* (1998), Voous (1957, 1983), Walton (1994), Watson (1987), Weinberg (1994), Weinberg & Roth (1994, 1998), Wetmore *et al.* (1984), Whitney (1985, 1989, 1991), Whitney & Miller (1987), Williams & Wood (2002), Winker *et al.* (1990), Yahner & Ross (1995), Yong & Moore (1993, 1994).

Genus *CATHARUS* Bonaparte, 1850

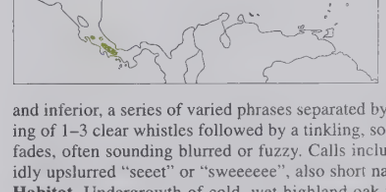
142. Black-billed Nightingale-thrush

Catharus gracilirostris

French: Grive à bec noir **German**: Graukehl-Musendrossel **Spanish**: Zorzalito Piquinegro
Other common names: Slender-billed Nightingale-thrush

Taxonomy. *Catharus gracilirostris* Salvin, 1865, Volcán de Cartago, Costa Rica.
Three subspecies recognized.

Subspecies and Distribution.
C. g. gracilirostris Salvin, 1865 – Costa Rica.
C. g. accentor Bangs, 1902 – W Panama (W Chiriquí).
C. g. bensoni Griscom, 1924 – E Chiriquí, in W Panama.



Descriptive notes. 14·5–16 cm; 21 g. Small thrush. Nominate race has dull grey crown, warm brown upperparts, mid-grey face and pale grey chin and throat; olive-brown to pale brown breastband, grey flanks and whitish mid-belly to vent; bill black; legs greyish-brown. Sexes similar. Juvenile is duller than adult, with less grey, breast and flanks mottled brown. Race *accentor* is barely distinct from nominate, but slightly less rufescent, more olive-tinged above, with longer bill; *bensoni* is darker, more fuscous-crowned and more rufous dorsally than both previous and nominate. Voice. Song resembles that of *C. frantzii*, but thinner, higher and inferior, a series of varied phrases separated by pauses of several seconds, each phrase consisting of 1–3 clear whistles followed by a tinkling, sometimes jumbled trill that may rise and fall as it fades, often sounding blurred or fuzzy. Calls include high, thin descending "pseeeew", loud, rapidly upslurred "seeet" or "sweeeeee", also short nasal wren-like buzzy chatter, "chrr".

Habitat. Undergrowth of cold, wet highland oak forest, forest borders, second growth, park-like highland pastures, timber-line scrub, regenerating clearings and patches of denser shrubbery in *páramo*, apparently generally preferring partly disturbed areas. In Costa Rica, 2150–3500 m on Atlantic slope and 2500–3500 m on Pacific slope; in Panama, above 2100 m in W Chiriquí and at 1800–2100 m in E Chiriquí.

Food and Feeding. Insects, spiders and other vertebrates; also many berries. Forages on ground or on large horizontal or inclined branches, probing tufts of moss and lichen, and turning leaf litter with bill; also feeds well up in canopy. Regularly emerges into semi-open, and even feeds at edge of recently ploughed fields.

Breeding. Mar–Jun in Costa Rica. Nest a bulky cup of green moss and rootlets, with finely woven lining of grass stems and fine rootlets, placed 1–5 m up in dense shrub or small tree. Eggs 2, blue to greenish-blue with reddish-brown to deep chestnut speckles. No other information.

Movements. Mainly sedentary. In Panama a few wander lower, to 1500 m, in W Chiriquí, although unclear whether this movement is seasonal.

On following pages: 143. Orange-billed Nightingale-thrush (*Catharus aurantiirostris*); 144. Slaty-backed Nightingale-thrush (*Catharus fuscater*); 145. Russet Nightingale-thrush (*Catharus occidentalis*); 146. Ruddy-capped Nightingale-thrush (*Catharus frantzii*); 147. Black-headed Nightingale-thrush (*Catharus mexicanus*); 148. Spotted Nightingale-thrush (*Catharus dryas*); 149. Veery (*Catharus fuscescens*); 150. Grey-cheeked Thrush (*Catharus minimus*); 151. Bicknell's Thrush (*Catharus bicknelli*); 152. Swainson's Thrush (*Catharus ustulatus*); 153. Hermit Thrush (*Catharus guttatus*).

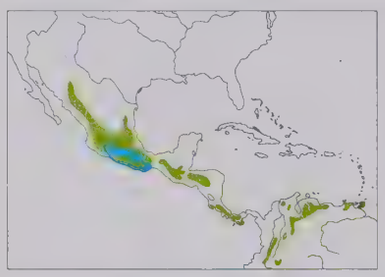
Status and Conservation. Not globally threatened. Restricted-range species: present in Costa Rica and Panama Highlands EBA. In Costa Rica, common to abundant in forest (abundance increasing above 2400 m) and uncommon in *páramo* in Cordilleras Central and de Talamanca. Fairly common to common in Panama.
Bibliography. Anon. (1998b), Carriker (1910), Clement & Hathway (2000), Phillips (1991), Ridgely & Gwynne (1989), Slud (1964), Stiles & Skutch (1989), Wetmore *et al.* (1984).

143. **Orange-billed Nightingale-thrush**

Catharus aurantiirostris

French: Grive à bec orange **German**: Goldschnabel-Musendrossel **Spanish**: Zorzalito Piquigualda
Other common names: Grey-headed Nightingale-thrush (*griseiceps/phaeopleurus*)

Taxonomy. *Turdus aurantiirostris* Hartlaub, 1850, Caracas, Venezuela.
Grey-headed races *griseiceps* and *phaeopleurus* sometimes considered to represent a separate species. Race *sierrae* sometimes merged into nominate. Described races *aenopennis* (from N Sinaloa and SW Chihuahua, in Mexico), *bangsi* (El Salvador, Honduras and Guatemala) and *russatus* (mountains of SW Costa Rica and W Panama) synonymized with, respectively, *clarus*, *melpomene* and *griseiceps*. Eleven subspecies recognized.
Subspecies and Distribution.
C. a. clarus Jouy, 1894 – NW & NC Mexico.
C. a. melpomene (Cabanis, 1850) – C & S Mexico, El Salvador, Guatemala, Honduras and NW Nicaragua.
C. a. costaricensis Hellmayr, 1902 – Costa Rica.
C. a. griseiceps Salvin, 1866 – SW Costa Rica and W & C Panama.
C. a. phaeopleurus P. L. Sclater & Salvin, 1876 – W Colombia.
C. a. sierrae Hellmayr, 1919 – Sierra Nevada de Santa Marta, in N Colombia.
C. a. aurantiirostris (Hartlaub, 1850) – NE Colombia and W Venezuela.
C. a. barbaritoi Aveledo & Ginés, 1952 – Perijá Mts, in NW Venezuela.
C. a. birchalli Seebohm, 1881 – NE Venezuela and Trinidad.
C. a. inornatus J. T. Zimmer, 1944 – W slope of E Andes of Colombia (Santander).
C. a. insignis J. T. Zimmer, 1944 – E slope of Andes of Colombia.



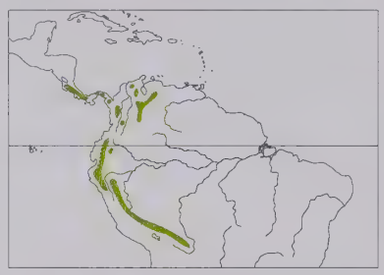
Descriptive notes. 15·5–17 cm; 21–32 g. Nominate race is rufous-tinged olive-brown from crown to tail, more rufous on rump, tail and wings; greyish-brown face with narrow orange eyering; broad whitish throat shading into pale grey underparts, white belly to vent; bill longer and stronger than that of *C. gracilirostris*, orange; legs brownish-orange. Sexes similar. Juvenile is brown with vague buff flecking above, mottled and smudged neck, breast and flanks, throat and belly. Race *clarus* is warm olive-brown above; *melpomene* has stronger rufous on wings and tail; *costaricensis* is like previous, but richer rufous on wings and tail; *griseiceps* has head grey, greyer underparts; *phaeopleurus* is similar to last, but stronger olive-brown above, bill orange-red; *inornatus* is like previous, but no rufous in upperparts, whiter on throat and underparts; *barbaritoi* also lacks rufous tones above, is greyish below; *birchalli* is more rufous than nominate on upperparts, heavier grey on flanks; *insignis* is like nominate above but duller, with vague throat streaks; *sierrae* rather similar to nominate. Voice. Song, given all year, from hidden perch less than 2 m up, relatively poor and unmusical, consists of a series of short jumbled squeaky and often tinny phrases with chips, trills and warbles, each phrase repeated several times, "chiviree che-oo" or "chik'r ssir-irr-it" (Middle America), jerkier and scratchier than those of congeners, often sustained for long periods; songs vary geographically, those at San Agustín (Colombia) noted as "wa-trípsee-spít-wachee" and on Trinidad as "sesiityeliik" (last 2 syllables loud); also, individuals sing several different songs. Call when scolding a distinctive nasal rising "waaa-a-a-a" or "meeeahr" or "wheeirt", very like a call of *C. fuscescens* and recalling Grey Catbird (*Dumetella carolinensis*); also a low "chuck" followed by nasal wheeze, a weak "chirr chrit", sometimes prolonged into nasal chatter, and prolonged thin whistling "kreee" or "tseee" in annoyance or anxiety.
Habitat. In Middle America, brushy or fairly open understorey and low dense thickets in various woodland types, including arid thorn-forest, second growth, forest edge, lighter woodland, roadside vegetation, scrubby slopes and ravines, plantations, quiet shrubby gardens and streamsides in humid pine–oak forest; 600–2500 m, in Panama 900–1650 m, but 400–1500 m in one region of S Pacific slope in Costa Rica. In South America, undergrowth of forest borders, lighter woodland, dry semi-deciduous forest thickets, moist evergreen forest borders, low rainforest, cloudforest, bamboo clumps, regenerating clearings, shrubby pastures, shade coffee, and even shrubby areas in towns and around houses; 600–2200 m, but 800–2900 m in Venezuela.
Food and Feeding. Insects, spiders, worms and other invertebrates; also fruit and seeds, including deep purple berries of *Miconia trinervia* and seeds of epiphytic *Clusia*. Forages mostly on or near ground, flipping over leaf litter, sometimes entering trail or small clearing, but ascends to middle strata for berries and arillate seeds. Seen to follow army ants in Trinidad.
Breeding. Late Apr to Sept in Mexico; Mar–Aug in Costa Rica; Mar–Jul and Nov in Colombia; May in Trinidad. Nest a bulky thick-walled cup of green moss, rootlets and coarse dry grass, lined with thin tendrils, rootlets, grass stems or inflorescences, placed at 0·1–3 m (great majority 1–2 m up) in shrub (e.g. *Alnus*, *Salix*), thicket, coffee bush, maize plant, fruit tree or hedge, never far from dense cover. Eggs 2–3, grey, blue, pale blue or greenish-white with sparse to heavy reddish-brown and pale lilac spots and blotches; incubation period 13–15 days; nestling period 13–17 days. Of 27 nests found at all stages, 17 (63%) produced at least one fledgling; nestlings sometimes parasitized by fly larvae, but these develop and vanish in a few days without detectable effect on host.
Movements. Resident or partial migrant. Descends to sea-level Oct–Apr on Pacific slope of Mexico, and populations in far N part of range may then move S. Formerly occurred virtually down to sea-level in Panama (E Chiriquí and S Veraguas), possibly as altitudinal migrant. Vagrants recorded in extreme S USA.
Status and Conservation. Not globally threatened. Fairly common to common in most of range. Common in S Mexico (Oaxaca), but uncommon in interior highlands of Honduras. Common on Pacific slope and in Valle Central of Costa Rica, and fairly common in Panama. Fairly common but local in Venezuela. Relatively rare in Trinidad, but fairly common at high elevations. During non-breeding season, occurs in rather high numbers in arid thorn-forests of Colima, SW Mexico.
Bibliography. Anon. (1998b), Behrstock & Eubanks (1997), Belcher & Smooker (1937), Binford (1989), Carriker (1910), Chapman (1917), Clement & Hathway (2000), ffrench (1991), Fjeldså & Krabbe (1990), Friedmann *et al.* (1957), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995), Junge & Mees (1958), Land (1970), Miller (1963), Monroe (1968), Phelps & Phelps (1950), Phillips (1991), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Rowley (1966, 1984), Russell & Monson (1998), Schaldach (1963), Skutch (1960, 1981), Slud (1964), Stiles & Skutch (1989), Wallace (1965), Wetmore *et al.* (1984).

144. **Slaty-backed Nightingale-thrush**

Catharus fuscater

French: Grive ardoisée **German**: Graurücken-Musendrossel **Spanish**: Zorzalito Sombrío
Other common names: Black-backed Nightingale-thrush (*hellmayri*)

Taxonomy. *M.(yioturdus) fuscater* Lafresnaye, 1845, Bogotá, Colombia.
Proposed taxon *fumosus* apparently based on hybrid between present species and *C. mexicanus*. Racial affiliation of population recently discovered in C Andes of Colombia not determined. Seven subspecies recognized.
Subspecies and Distribution.
C. f. hellmayri Berlepsch, 1902 – Costa Rica and W Panama.
C. f. mirabilis Nelson, 1912 – E Panama.
C. f. fuscater (Lafresnaye, 1845) – E Panama (E Darién), Colombia S to W Ecuador, and W Venezuela.
C. f. sanctaemartae Ridgway, 1904 – Santa Marta Mts, in N Colombia.
C. f. opertaneus Wetmore, 1955 – W Colombia (N part of W Andes).
C. f. caniceps Chapman, 1924 – NW & C Peru, probably also SW Ecuador.
C. f. mentalis P. L. Sclater & Salvin, 1876 – SE Peru and NW Bolivia.



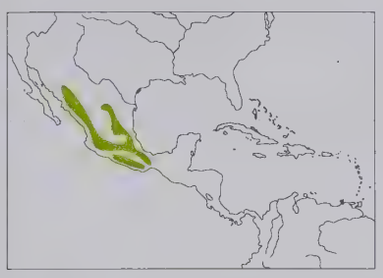
Descriptive notes. 17–19 cm; 35–38 g. Male nominate race is blackish-grey above from below eye to tail, blackest on crown and in front of eye; whitish below, with grey-flecked throat, pale grey breast, smoky-grey flanks; narrow orange eyering, whitish iris; bill red-orange; legs orange-yellow. Female is similar to male, but rather darker and darker-billed. Juvenile is dark brown-grey above, paler below, with whitish chin and vent, dark iris. Race *hellmayri* is blacker above than nominate, with greyer or all-grey throat, and with bright white iris and broader yellow eyering; *mirabilis* is paler below; *sanctaemartae* is darkest, including on chin, with throat to flanks smoky-grey; *opertaneus* is like nominate, but brownish above and on flanks; *caniceps* has chin and throat whitish; *mentalis* is tinged dark brown above, throat buffish, undertail-coverts brown. Population in C Andes of Colombia is olive-brown with brown iris. Voice. Song resembles that of *C. dryas*, but more repetitive and leisurely, dreamy and mesmerizing, with phrases of 2–3 pure whistled notes often alternating, "toh toh tii… tii toh" or "tlii to tliidelii… to wii tlii?...", also described as resembling that of a *Myadestes* but simpler and lower-pitched, resulting in haunting, ethereal flute-like "eer-lee, ur-eee-lee", like distant rusty gate; infrequent in dry season but throughout day in early wet season (peak Jun) in Venezuela. Calls include distinctive querulous cat-like "wrrenh", "maaaaah" or "maow", with high whistled "poeeee" in agitation, also (possibly same call) fuzzy "wheeety weer"; also low "khroum-khroum".
Habitat. Undergrowth of dense mossy humid and wet montane forest, subtropical forest and cloudforest, in foothills and lower highlands, at 600–3250 m (mostly 800–2600 m); 900–1500 m in Panama, mainly above 1200 m in Ecuador, and 1500–2900 m in Venezuela. Often near streams; seems to avoid climatically drier habitats.
Food and Feeding. Insects, sowbugs, spiders and, commonly, earthworms; also many berries of Rubiaceae, Gesneriaceae, etc. Commonly forages on ground, often in heavy cover, gleaning in leaf litter; also in lower understorey; in twilight may enter small forest clearings and tracks. In Central America and Venezuela, seen regularly at small swarms of highland *Labidus* army ants, and this may happen also in Andes.
Breeding. Apr–Aug in Costa Rica; Apr–Sept (Feb–Jun in C Andes) in Colombia; fledglings in Jul in Ecuador; Dec–Jan, with fledglings Feb, in Peru; fledglings Apr in Bolivia; presumed on basis of singing intensity to breed in Jun in Venezuela. Nest a substantial cup of moss, leaves, stems, rootlets and plant fibres, lined with black *Marasmius* rhizomorphs, heavily decorated on outside with green moss, placed 0·5–3 m up in bush or fork of understorey shrub or tree. Eggs 2, pale blue, blue-green or greenish-white with rufous-chestnut to cinnamon-brown spots and blotches. No other information.
Movements. Sedentary, so far as known.
Status and Conservation. Not globally threatened. Uncommon to locally fairly common. Common in Costa Rica on both slopes, and sometimes abundant in Guanacaste and Tilarán Cordilleras. Locally fairly common in Panama, where the common nightingale-thrush of the Fortuna area (C Chiriquí); population in Boquete area, equally numerous in early 20th century, now apparently reduced or extirpated owing to extensive forest clearance. Locally common in Venezuela, where recorded from Sierra Nevada National Park. Recorded from Cueva de los Guácharos National Park, in Colombia, and Podocarpus National Park, in Ecuador.
Bibliography. Anon. (1998b), Beltrán & Kattan (2001), Carriker (1910), Chapman (1926), Clement & Hathway (2000), Fjeldså & Krabbe (1990), Hilty (2003), Hilty & Brown (1986), Phelps & Phelps (1950), Phillips (1991), Ridgely & Greenfield (2001), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Rodríguez (1982), Salaman (1994), Slud (1964), Stiles & Skutch (1989), Walker (2001), Wetmore *et al.* (1984).

145. **Russet Nightingale-thrush**

Catharus occidentalis

French: Grive roussâtre **German**: Braunkopf-Musendrossel **Spanish**: Zorzalito Piquipardo
Other common names: Olive Nightingale-thrush (*olivascens*)

Taxonomy. *Catharus occidentalis* P. L. Sclater, 1859, Totontepec, Oaxaca, Mexico.
Formerly considered conspecific with *C. frantzii*, but the two occur sympatrically with no evidence of interbreeding. Race *olivascens* has been accorded full species rank in the past, but vocally similar to other races. Four subspecies recognized.
Subspecies and Distribution.
C. o. olivascens Nelson, 1899 – NW Mexico.
C. o. lambi A. R. Phillips, 1969 – W & C Mexico.
C. o. fulvescens Nelson, 1897 – SW Mexico.
C. o. occidentalis P. L. Sclater, 1859 – S Mexico (Oaxaca).



Descriptive notes. 15·5–18 cm; 26 g. Nominate race has rich rufous-brown crown, shading through to warm russet upperparts; face greyish-brown, throat whitish with buff flecks spreading onto breast, and giving way to pale grey flanks and whitish remaining underparts; bill dark, yellowish lower mandible; legs pale flesh. Sexes similar. Juvenile is brown above with rusty-buff spots and streaks, whitish-buff below with brown mottling, strongest on breast. Race *olivascens* has more olive face, wings and tail, breast with vague greyish spots; *lambi* is slightly darker above than previous, crown more red-brown, chest spots somewhat smaller; *fulvescens* is slightly larger than nominate, with more russet forehead. Voice. Song consists of varied, thin, tinny-sounding phrases, "she-vee-ee-i-lu" or "chee ti-vee", sometimes repeated in rapid succession. Calls include quiet low gruffish "chuk" or "chruh" and nasal mewing "reear".
Habitat. Fairly open understorey of humid to semi-arid open pine–oak and oak forest, bordering patches of sage (*Salvia*) and other shrubs; avoids shadiest ravines. At 1500–3500 m.
Food and Feeding. Invertebrates and fruit. Forages on ground in dense cover, sometimes coming out in open at dawn; also in trees for berries.
Breeding. Apr–Jul/Aug. Nest of grass and plant material, moss on outside, well concealed at low to middle level in tree or bush, occasionally on ground. Eggs 2, more rarely 3, plain pale blue. No other information.
Movements. Mainly resident. Extreme N populations may move S in winter, and S populations (*fulvescens*) descend somewhat lower in winter.
Status and Conservation. Not globally threatened. Fairly common to common; common in Pacific and interior regions of Oaxaca.
Bibliography. Anon. (1998b), Binford (1989), Clement & Hathway (2000), Friedmann *et al.* (1957), Howell & Webb (1995), Phillips (1969, 1991), Raitt & Hardy (1970), Rowley (1966), Rowley & Orr (1964), Rowley (1984), Russell & Monson (1998), Schaldach (1963).

146. **Ruddy-capped Nightingale-thrush**

Catharus frantzii

French: Grive à calotte rousse **German**: Bergmusendrossel **Spanish**: Zorzalito de Frantzius
Other common names: Frantzius's/Highland Nightingale-thrush

Taxonomy. *Catharus Frantzii* Cabanis, 1861, Volcán de Irazú, Costa Rica.
Formerly considered conspecific with *C. occidentalis*, but the two occur sympatrically with no evidence of interbreeding. Geographical variation very slight; some races may be merged in due course. Eight subspecies currently recognized.
Subspecies and Distribution.
C. f. omiltemensis Ridgway, 1905 – SW Mexico.
C. f. nelsoni A. R. Phillips, 1969 – SC Mexico.
C. f. chiapensis A. R. Phillips, 1969 – S Mexico E to W Guatemala.
C. f. alticola Salvin & Godman, 1879 – S Mexico (SE Chiapas) and S Guatemala.
C. f. juancitonis Stone, 1931 – N El Salvador and Honduras.
C. f. waldroni A. R. Phillips, 1969 – N Nicaragua.
C. f. frantzii Cabanis, 1861 – Costa Rica.
C. f. wetmorei A. R. Phillips, 1969 – W Panama.



Descriptive notes. 15·5–18 cm; 28–32 g. Nominate race has rich rufous-brown crown, shading to brownish-olive upperparts; face greyish, throat whitish with dark flecks spreading on to grey breast and remaining underparts, whitish on belly; bill dark, yellowish lower mandible; legs flesh-coloured. Sexes similar. Juvenile is very like juvenile *C. occidentalis*, but redder on crown. Race *omiltemensis* differs minimally from nominate, being duller above, whiter below; *chiapensis* is like previous, but uppertail-coverts and tail slightly darker; *nelsoni* has brownish wash on breast; *alticola* is greyer below than nominate; *juancitonis* is smaller than nominate; *waldroni* is like last but smaller still, less brown-washed on breast; *wetmorei* has paler crown, back and breast. Voice. Song, by male, usually in evening or in dim, misty conditions from hidden low perch, consists of sustained melancholic series of ever-varied short, liquid, throaty phrases, with flute-like trills, clear whistles and caroling warbles, "shee-vee-lie-ree" or "shee-vee-shee-oo", richer, more musical and more varied than that of *C. occidentalis*. Calls include sweet quavering upslurred whistle, "whierrr" or "whoeeet", becoming burry "wheeer" or rising "correeee" in agitation; also frog-like rising "rrerrk" or hoarse "worrrk".
Habitat. Dense damp understorey of wet to semi-humid conifer, pine–oak and evergreen forest (cloudforest) and adjacent thickets, edges of park-like highland pastures, overgrown clearings, bamboo-choked ravines and tall second growth in otherwise open areas, commonly near surface water of creek; generally 1500–3500 m, but in Costa Rica down to 1350 m in N cordilleras and only to 2500 m elsewhere. Where sympatric with *C. occidentalis*, restricted to dense broadleaf riparian forest in deep canyons. In El Salvador, preference for brushy fields and hedgerows, patches of low second growth and edges of brush-choked ravines; was particularly abundant in a field with patchy waist-high brush and in a plot of felled timber with decaying crowns and unsalvaged logs, all interspersed with new saplings.
Food and Feeding. Insects and other invertebrates; berries. Forages on and near ground, sometimes entering roadsides and pastures with tall adjoining vegetation.
Breeding. Jun in Mexico, Feb and Jun–Aug in El Salvador and Apr–Jun in Costa Rica. Nest a bulky cup of green moss and liverworts mixed with weed stems, pieces of vine and grass, lined with rhizomes, thin fibrous rootlets, fine grass and leaf skeletons, placed 1–4 m up in forest undergrowth, tangled thicket or shrub, once on bamboo sprays overhanging deep ravine. Eggs 2, pale greyish, greenish-blue or bluish with heavy cinnamon-brown or reddish-brown and lilac mottling; incubation period 15–16 days; fledging period 14–16 days.
Movements. Apparently sedentary; some movement to lower levels in winter.
Status and Conservation. Not globally threatened. Fairly common to common throughout range. Uncommon in Oaxaca (Mexico). Locally very common in El Salvador; thought probably to have benefited from creation of scrub by clearance of cloudforest. Fairly common on both slopes in Costa Rica, most abundant on Cordillera Central (absent from Guanacaste and Tilarán Cordilleras). In Panama, common in W Chiriquí, and the most numerous nightingale-thrush in the Bambito and Cerro Punta area.
Bibliography. Anon. (1998b), Binford (1989), Carriker (1910), Clement & Hathway (2000), Howell & Webb (1995), Land (1970), Monroe (1968), Phillips (1969, 1991), Raitt & Hardy (1970), Ridgely & Gwynne (1989), Rowley (1966, 1984), Slud (1964), Stiles & Skutch (1989), Thurber *et al.* (1987), Wetmore *et al.* (1984).

147. **Black-headed Nightingale-thrush**

Catharus mexicanus

French: Grive à tête noire **Spanish**: Zorzalito Cabecinegro
German: Schwarzkopf-Musendrossel

Taxonomy. *Mal.(acocychla) mexicana* Bonaparte, 1856, Jalapa, Veracruz, Mexico.
Proposed taxon *fumosus* apparently based on hybrid between present species and *C. fuscater*. Four subspecies recognized.
Subspecies and Distribution.
C. m. mexicanus (Bonaparte, 1856) – EC Mexico.
C. m. cantator Griscom, 1930 – S Mexico and E Guatemala.
C. m. yaegeri A. R. Phillips, 1991 – Honduras.
C. m. carrikeri A. R. Phillips, 1991 – Nicaragua, Costa Rica and W Panama.



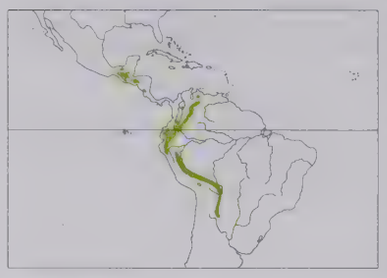
Descriptive notes. 15–16·5 cm; 30 g. Male nominate race has black crown, olive-brown upperparts, dark grey face, vaguely dark-streaked white throat, pale greyish-brown breast and flanks, white belly to vent; narrow eyering, bill and legs bright orange. Female is similar, but browner on head and breast, darker culmen. Juvenile is like juvenile *C. occidentalis*, but darker olive. Race *cantator* is slightly smaller, much greyer on face to throat, washed olive on breast; *yaegeri* is strongly rufescent dorsally; *carrikeri* is darker grey below, especially on flanks, than other races, dark ruddy-toned dorsally. Voice. Song, by male 1–3 m up in shrub, mostly at dawn and dusk and in afternoon, a series of rapid, thin, flute-like but slightly tinny, fuzzy phrases (often incorporating sharp slurred "sreek"), each repeated several times and consisting of 3–8 notes delivered in jumbled scratchy warble, at times running into warbled trill, e.g. "dleet-dloo-dlee-dlee"; resembles that of *C. aurantiirostris*. Calls include buzzy to harsh complaining upslurred mew, "rreahr", "meahh" or "dzeeeet", hard dry rattle or trill when agitated, soft blurred "pseeer", formicariid-like "grrr" and "meww", and slow plaintive "chowrr".
Habitat. Dense dark undergrowth of primary humid evergreen forest (cloudforest) and adjacent second growth in foothills and lower highlands, preferring cover near surface water, at 750–1800 m. In Costa Rica occurs lower, 300–1000 m, in wetter forest on Atlantic slope, and at 700–1500 m in slightly drier forest on Pacific slope; sometimes ventures into selectively logged openings. In Panama mainly in narrow band at 750–1050 m.
Food and Feeding. Beetles, caterpillars and other insects; also much fruit, such as *Psychotria* and *Cephaelis*. Forages on or near ground, tossing leaf litter with bill; may come on to roadsides in twilight.
Breeding. Apr–May in Mexico and Mar–Jul in Costa Rica. Highly site-faithful. Nest a substantial but neat cup of mosses, bark strips and/or rootlets, lined with leaf skeletons or rhizomes, decorated externally with green moss, placed 1–3 m up in fork of understorey shrub or small palm, often by stream. Eggs 2–3, pinkish-white to bluish-white with reddish-brown speckles. No other information.
Movements. In Mexico, far N populations may move S for period Oct-Mar; post-breeding altitudinal descent to near sea-level locally in Sierra de los Tuxtlas (S Veracruz). Sedentary in Costa Rica.
Status and Conservation. Not globally threatened. Fairly common to common. Common in Oaxaca, in S Mexico; report from Mexico City erroneous. Fairly common in Honduras. In Costa Rica, common in Atlantic foothill belt (locally up to 1000 m) and common on Pacific slope (locally to 1500 m); formerly widespread population in Valle Central now largely reduced or extirpated. In Panama known only from W foothills, where locally fairly common.
Bibliography. Anon. (1998b), Binford (1989), Carriker (1910), Clement & Hathway (2000), Friedmann *et al.* (1957), Howell & Webb (1995), Land (1970), Monroe (1968), Peters (1931), Phillips (1991), Ridgely & Gwynne (1989), Rowley (1984), Slud (1964), Stiles & Skutch (1989), Wetmore (1944), Wetmore *et al.* (1984).

148. **Spotted Nightingale-thrush**

Catharus dryas

French: Grive tavelée **German**: Tropfenbrust-Musendrossel **Spanish**: Zorzalito Overo
Other common names: Golden-breasted Nightingale-thrush

Taxonomy. *Malacocichla dryas* Gould, 1855, Guatemala.
Proposed race *harrisoni* (from Oaxaca, in S Mexico) regarded as exhibiting characters within the range of variation of *ovandensis*; similarly, *ecuadoreanus* (Andes of W Ecuador) within range of variation of *maculatus*; last-mentioned, however, is itself weakly differentiated and barely sustainable. Four subspecies recognized.
Subspecies and Distribution.
C. d. ovandensis Brodkorb, 1938 – S Mexico (Oaxaca, Chiapas).
C. d. dryas (Gould, 1855) – W Guatemala, El Salvador and Honduras.
C. d. maculatus (P. L. Sclater, 1858) – W Venezuela, E Colombia, W & E Ecuador, E Peru and W Bolivia.
C. d. blakei Olrog, 1973 – S Bolivia S to N Argentina (Jujuy, Salta).
Descriptive notes. 17–19 cm; 36–44 g. Male nominate race has sharply defined black head to submoustachial, with dull olive-grey upperparts, chin and throat rather plain buff, olive-spotted apricot-yellow from lower throat and sides of neck to belly, greyish flanks, whitish lower belly to vent; eyering, bill and legs orange. Female is similar, but black of head greyer, back more olive, culmen darker. Race *ovandensis* is olive-grey dorsally, greyer wings, spotting below grey; *maculatus* is darker olive dorsally, deeper yellow with stronger spotting below; *blakei* is like previous, but throat buffy. Voice. Song, sometimes in flight, a series of very short, variable phrases, each consisting of 2–3 rich liquid (and occasional guttural) notes, e.g. "tru-lii? chii-lolíí trolowi chii-trelelíí trolowii", slightly faster, lower and burrier than that of *C. fuscater*, often reminiscent of *Hylocichla*



mustelina; often clacks bill loudly. Calls include nasal complaining "rrehr" and "rreh'hu" or "reh'chew".

Habitat. Undergrowth of humid mossy montane, foothill and lower subtropical forest (cloudforest), especially in damp ravines and along forested streams. Mainly 600–2300 m in South America, but 650–1800 (locally down to 400 m) in Ecuador, and 900–2200 m in Venezuela; in Middle America 1200–3000 m.

Food and Feeding. Forages commonly on ground among leaf litter, occasionally coming on to forest trails to feed in twilight. Sometimes attends army-ant swarms.

Breeding. May–Oct in Mexico and Aug in El Salvador; fledglings in Feb in Bolivia and Feb and Sept in Peru; juvenile Apr in Ecuador. Eggs 2, bluish-white with rusty and grey speckles. No other information.

Movements. Resident; Ecuador record from as low as 175 m in Jul may refer to seasonal altitudinal movement, but evidently unusual.

Status and Conservation. Not globally threatened. Locally fairly common. Uncommon to rare (rarest of this genus) in Honduras. Very local , although possibly overlooked, in Venezuela; spotty distribution thought possibly due to competition with *C. fuscater*. Present in Cueva de los Guácharos National Park, in Colombia. In Ecuador, generally more numerous and widespread on W slope of Andes than on E; recorded from Machalilla National Park.

Bibliography. Anon. (1998b), Becker & López (1997), Binford (1989), Canevari *et al.* (1991), Chapman (1917, 1926), Clement & Hathway (2000), Fjeldså & Krabbe (1990), Friedmann *et al.* (1957), Hilty (2003), Hilty & Brown (1986), Howell & Webb (1995), Land (1970), Monroe (1968), Parker & Carr (1992), Phelps & Phelps (1950), Phillips (1991), Phillips & Rook (1965), Rasmussen *et al.* (1996), Ridgely & Greenfield (2001), Ridgely & Tudor (1989), Robbins & Ridgely (1990), Thurber *et al.* (1987).

149. Veery

Catharus fuscescens

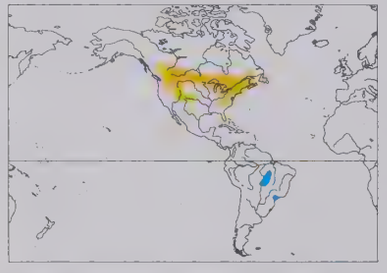
French: Grive fauve **German**: Wilsondrossel **Spanish**: Zorzalito Rojizo
Other common names: Wilson's/Tawny/Willow Thrush

Taxonomy. *Turdus Fuscescens* Stephens, 1817, Pennsylvania, USA.

Formerly placed in *Hylocichla*, along with *C. minimus*, *C. bicknelli*, *C. ustulatus* and *C. guttatus*. Proposed races *levyi* (Alberta E to N Michigan and Wisconsin) and *pulichorum* (W Maryland S to N Georgia) considered inseparable from *salicicola* and nominate, respectively; *subpallidus* sometimes merged with *salicicola*. Four subspecies tentatively recognized.

Subspecies and Distribution.

C. f. salicicola (Ridgway, 1882) – SW & SC Canada and W USA; non-breeding Brazil.
C. f. subpallidus (Burleigh & Duvall, 1959) – NW USA; non-breeding Brazil.
C. f. fuscescens (Stephens, 1817) – SE Canada and E USA; non-breeding Brazil.
C. f. fuliginosus (Howe, 1900) – extreme E Canada (S Quebec E to Newfoundland); non-breeding Brazil.



Descriptive notes. 17–19 cm; 25–43 g. Nominate race is rufous-brown above, with indistinct pale eyering; very lightly brown-spotted creamy-buff throat and upper breast, whitish lower breast to vent, slightly greyish flanks; bill dark on culmen and tip, pale flesh lower mandible; legs dull pale flesh. Sexes similar. Juvenile is like adult, but spotted and barred buff above, extensively mottled blackish-brown below; first-year has pale-tipped greater wing-coverts. Race *fuliginosus* is slightly larger than nominate, deeper brown above, with larger, sharper spots on breast; *salicicola* is more olive-brown above, with darker, more rounded breast spots; *subpallidus* is drabbest, brown above, well-defined breast spots, marginally paler buff throat. Voice. Song, mostly in early morning and especially in evening, a series of ethereal resonating phrases, smooth and rolling, each sounding as "da-veeur veeur veer veer" (with some variation), descending in two stages; partners sing back and forth during pair-bonding. Calls include distinctive nasal, rough, downslurred "feuw" or "breeuh" or "jerrr" for contact, "veer" in intraspecific aggression, more nasal high-pitched snarling "waaa-a-a-a" in attack (when may also make loud bill-snap), sharp "pwit" or "pwik" and other cacking notes in excitement, and mournful "whee-you-whee-you" when nest threatened; flight call a low, gentle "veeyer".

Habitat. Breeds in damp deciduous forests, selecting disturbed forest producing dense understorey, and late shrub or early tree successions; strong preference for riparian growth in some regions. In N hardwoods, found in 77% of disturbed and successional habitats available, but in only 18% of mature undisturbed ones (when moisture regime more important than herb cover); in one study, however, areas last cleared 40–60 years ago much preferred to those cleared 10–20 years ago. Competition with other thrushes may also determine breeding-habitat choice; e.g. where sympatric with *Hylocichla mustelina*, uses earlier succession and/or wetter areas; where sympatric with *C. guttatus*, often confined to hardwoods, with latter species in conifers. Breeds in lowlands and mountains, to 2500 m in Rocky Mts. On passage in Costa Rica and Panama, uses second growth and lower growth of forest, mainly in lowlands. In winter quarters occupies lower growth of forest, forest borders, *cerrado* and secondary woodland; apparent preference for primary areas while still migrating in Amazonia; migrants recorded to 2300 m in Colombia and, in Venezuela, to 900 m N of R Orinoco and to 1050 m S of river.

Food and Feeding. Mainly invertebrates, occasionally small amphibians, with some fruit in spring and summer; situation perhaps reversed in autumn and winter, but reports vague. In New Jersey study, diet 17% beetles, 12% hymenopterans, 10% lepidopterans, 5% grasshoppers, 5% spiders, 45% fruit and 5% seeds. In New Hampshire, Jun–Jul, only animals found in stomachs, mainly insects, particularly adult beetles, ants and wasps, also tipulid flies and leafhoppers. In Louisiana study, twelve of 28 stomachs contained only invertebrates (three with snails, two with caterpillars, one with a centipede), eleven contained invertebrates and fruit (two with snails, one with caterpillars, one with pillbug), and five contained only fruit, spicebush (*Lindera benzoin*) being favoured. Fruit reported in summer includes juneberries (*Amelanchier*), honeysuckle (*Lonicera tartarica*), strawberry (*Ascyrum*), blackberry (*Rubus*), wild cherry (*Prunus*), sumac (*Rhus*), dogwood (*Cornus*), blueberry (*Vaccinium*), wild grape (*Vitis*) and elderberry (*Sambucus*). Nestlings fed with small caterpillars, grubs, flies and slugs in first four days, with butterflies added later; in one area, newly fledged young taken to mulberry trees (*Morus rubra*), but not clear if for fruit. During migration in Costa Rica takes many fruits (*Cordia*, *Urera*, *Miconia*), but in Panama also many millipedes and termites, as well as bees, ants and snails. Forages on ground in series of frog-like hops, often near water, or low in undergrowth, using short flights to reach food items. Occasionally attends army-ant swarms.

Breeding. Mid-May to mid-Jul; single-brooded so far as known. Territory small, can be only 0·1 ha; average size of 61 territories 0·25 ha. Nest an open cup of stems, bark and leaf mould on leaf platform, lined with rootlets and fibres, placed on or near ground (usually below 1·5 m) in moist shaded site, in or at base of shrub, sapling or tree, e.g. balsam fir (*Abies balsamea*), maple (*Acer*), alder (*Alnus*), spruce (*Picea*) or birch (*Betula*), at base of stump, in grassy or herb clump, under brush or debris, occasionally in tree hollow. Eggs up to 5, typically 4, greenish-blue or bluish-green, usually plain, rarely with brown spots; incubation period 12 (10–14) days; nestling period 10–12 days; post-fledging dependence 2 weeks. Brood parasitism by Brown-headed Cowbird (*Molothrus ater*) significant, incidence at least 19% in Ontario and up to 87% in Alberta and Manitoba; fledges 2·5 own young per nest in unparasitized nests, 2·0 own young in parasitized ones. Hatching success 64·6% (186 of 288 eggs); of 61 nests, 23 (37·7%) produced fledged young; nests preyed on by snakes, chipmunks (*Tamias*), red squirrels (*Tamiasciurus hudsonicus*) and Blue Jays (*Cyanocitta cristata*). High inter-annual variability in population growth rates stem from variation in acorn masting patterns, e.g. more nests lost to rodents when latter's populations high in response to acorns, while raptors that increase in response to rodent outbreaks are major predators on both adults and juveniles; may recoup losses following seasons of low to moderate acorn crops. Probably breeds at 1 year. Oldest recorded individual at least 10 years old.

Movements. Long-distance migrant. Autumn departure from breeding grounds peaks late Aug to early Sept, main passage in Louisiana second half Sept. Passage through Middle America mostly at sea-level on Atlantic coast; occurs from S Mexico S to Honduras Sept–Oct, in Costa Rica late Sept to late Oct, in Panama late Sept to mid-Nov, rare in Cuba mid-Sept to late Oct. Winters in South America Sept–Apr, but there apparently keeps moving to some extent, taking elliptical circuit through Amazonia (more to W and to S late in year, more to E and to N early in year); key wintering area S of Amazon Basin in SC & SE Brazil. Rarely recorded in Colombia, Sept–Oct and Mar; few records Venezuela, span mid-Oct to mid-Apr. Return passage in spring (mainly on Atlantic coast) Mar–Apr in Costa Rica, Apr–May in Honduras and Mexico; rare in Panama and Caribbean; peak movement through Louisiana late Apr, arrival in N breeding areas by mid-May. Rare vagrant S to Chile and in W Europe.

Status and Conservation. Not globally threatened. Breeding Bird Surveys reveal fairly high densities, higher in Canada than in USA; highest in Maine (USA) and Ontario (Canada); highest densities in N spruce–hardwoods. Population trends negative: significant overall decline of 1% per year 1966–1991, accelerating to become 1·4% per year in USA and 1·7% per year in Canada 1982–1991. Although a species of disturbed habitats, increasing fragmentation of forests and woodlands, although augmenting the amount of favoured edge habitats, is allowing extensive penetration of breeding areas by Brown-headed Cowbird, thus causing reduced breeding success. Migrants commonly killed by flying against transmission towers and other structures. Loss of tropical forest in non-breeding quarters probably also a contributory factor, particularly as it is now clear that winter range is relatively restricted, and in an area of rapid deforestation. Seemingly uncommon visitor in South America, but its abundance evidently in part masked by its reclusive behaviour. In Venezuela considered probably an uncommon migrant and winterer.

Bibliography. Amos (1991), Annan (1962), Anon. (1998b), Bent (1949), Bertin (1977), Blake & Loiselle (1992a), Bond (1956b, 1979), Borror (1964), Bradshaw & Dowdall (1993), Browning (1990), Clement & Hathway (2000), Cochran & Kjos (1985), Cochran *et al.* (1967), Cramp (1988), David & Gosselin (2002a), Day (1953), DeGraaf & Rappole (1995), Dilger (1956a, 1956b), Duguay *et al.* (2001), Ellison (2001), Forbush & May (1939), Friedmann *et al.* (1977), Garrido & Kirkconnell (2000b), Glutz von Blotzheim & Bauer (1988), Godfrey (1986), Hatch *et al.* (1986), Hausman (1936), Herkert (1995), Hilty (2003), Hilty & Brown (1986), Hollom *et al.* (1988), Howell & Webb (1995), King (1999), Land (1970), Lee Jones (2004), MacNally *et al.* (1986), Monroe (1968), Morse (1971), Moskoff (1995), Nice (1962), Noon (1981), Odum *et al.* (1961), Ormsby (1961), Paszkowski (1984), Paynter (1995), Phelps & Phelps (1950), Phillips (1991), Poulin & Lefebvre (1996), Quay (1986), Raffaele *et al.* (1998), Remsen (2001), Reynolds & Mills (1981), Ridgely & Gwynne (1989), Ridgely & Tudor (1989), Rodríguez (1982), Rogers & Odum (1966), Sadler (1987a), Samuel (1972), Schmidt (2003), Sibley (2000), Sick (1985, 1993), Slud (1964), Smithe (1966), Sousa (1982), Stein (1956), Stiles & Skutch (1989), Stotz *et al.* (1992), Stouffer (2001), Suthers (1987/88, 1993), Voous (1957, 1983), Weary, Lemon & Date (1986, 1987), Weary, Weisman *et al.* (1991), Wetmore *et al.* (1984), Willis (1966), Yong & Moore (1990).

150. Grey-cheeked Thrush

Catharus minimus

French: Grive à joues grises **German**: Grauwangendrossel **Spanish**: Zorzalito Carigrís
Other common names: Small Thrush

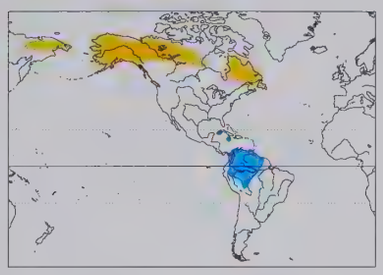
Taxonomy. *Turdus minimus* Lafresnaye, 1848, Bogotá, Colombia.

Formerly placed in *Hylocichla*, along with *C. fuscescens*, *C. bicknelli*, *C. ustulatus* and *C. guttatus*. Until recently treated as conspecific with *C. bicknelli*; vocal, morphological and even biochemical differences very subtle, but seemingly parapatric breeding and probably discrete winter distributions suggest species-level separation just tenable; nonetheless, intermediates between the two taxa occur, and Newfoundland population of present species approaches *C. bicknelli* in size and coloration. Range of nominate debatable; race *aliciae* only slightly different, and species sometimes treated as monotypic. Two subspecies currently recognized.

Subspecies and Distribution.

C. m. aliciae (S. F. Baird, 1858) – extreme NE Siberia, Alaska and Canada; non-breeding mainly N South America E of Andes.
C. m. minimus (Lafresnaye, 1848) – E Canada (Newfoundland, possibly also N Quebec); non-breeding N South America E of Andes.

Descriptive notes. 17–18·5 cm; 26–50 g. Nominate race is olive-tinged grey-brown above, dull whitish below, with slightly greyish face, indistinct pale eyering, dark brown malar connecting to band of dark brown spots on lower (buff-washed) neck side and breast; bill dark, small pinkish area at base of lower mandible; legs dull flesh. Sexes similar. Juvenile is like adult, but spotted and streaked stony-buff above, broadly marked with diffuse grey-brown bars below. Race *aliciae* is slightly larger and colder brown above than nominate, duller below, with brownish-olive wash on flanks. Voice. Song, rarely in winter quarters and generally limited to 6-week period on breeding grounds, a complex jumble of rather nasal burry flute-like notes that descends in pitch and is occasionally prolonged into short trills, with constant ending as e.g. "whit-whidio"; higher and thinner than that of *C. fuscescens*, and nasal with stuttering pauses, thus "ch-ch zreeew zi-zi-zreeee zi-zreeew"; by male from exposed perch on treetop (Alaska), often more hidden perch in lower latitudes of breeding range. Female has weak song. Calls include very variable, thin, weak, slightly



burry or scratchy "pseer" or "phreu" or "what"; for contact (often at night on migration) a piercing "pweep" or "pe-i-i-ir" or "jee-er", very like that of *C. ustulatus*. Bill-snaps in aggression.
Habitat. Breeds in taiga and adjacent tundra, where found in areas of medium-height shrubs with dense woody undergrowth, e.g. brushy riparian willow–alder (*Salix–Alnus*) and floodplain cottonwood (*Populus*), also patches of low spruce (*Picea*) forest with dense undergrowth, shrubbery in open woodland and on glacial moraines, alder patches on tundra and coastal hills, shrubby enclaves in taiga, mature stands of conifers, stunted subalpine fir (*Abies*) and spruce with willows and undergrowth of bilberry (*Vaccinium*) and other shrubs. In one study of Alaskan breeding habitat, mean shrub height in cottonwood forest 2·6 m, with dominant plants swamp currant (*Ribes triste*), prickly rose (*Rosa acicularis*) and raspberry (*Rubus idaeus*); in spruce forest, shrub layer composed of dwarf birch (*Betula*). In Siberia, nests in tall (sometimes higher than 2 m) willows. On migration favours wooded areas with good shrub layer, but occurs briefly in more open areas, including city parks and gardens; in Costa Rica in streamside thickets, dense swampy dips, brush-covered, log-strewn open woodland, taller second growth and old cacao plantations in lowlands, also in other habitats up to 1500 m, often in flocks of *C. ustulatus*. In winter quarters occupies lower growth and occasionally middle strata of mature forest (especially *terra firme*), forest borders, secondary woodland, thickets along small streams and densely wooded swales, mostly in lowlands and foothills below 1500 m. In South America higher on passage, e.g. 2700–2800 m in C valley in Ecuador, and to 3000 m in Venezuela N of R Orinoco, and then in almost any habitat.
Food and Feeding. Invertebrates, with some fruit. Stomachs of birds mostly on spring and autumn passages held 75% animal and 25% vegetable matter: beetles formed 33%, ants 16%, caterpillars 9%, bees and wasps 6%, spiders 6%, grasshoppers 2% and other animal groups 3%, fruits 24% and other vegetable material 1%. In Siberia, stomachs of two birds in Jul contained carabid beetles, weevils, caterpillars, hymenopterans, moths and molluscs. In Panama, found to consume high numbers of termites, millipedes and hymenopterans, in addition to fruit. Predominantly terrestrial forager; noted as using foot-quivering apparently to disturb prey. In winter feeds closer to ground than does *C. ustulatus*, in damp low tangles or on ground itself; rarely visits fruiting trees. On Barro Colorado I, in Panama, follows army-ant swarms.
Breeding. Mid-May to early Aug in North America and Jun–Jul in Siberia; single-brooded. Monogamous. No data on territory size, but recorded densities suggest 2·6–4 ha but sometimes as small as 1·1 ha. Nest a compact strong deep cup made of small twigs, rootlets, stems, horsetails (*Equisetum*) etc., layered internally with damp moss and mud and lined with fine grasses, in Alaska placed mostly in crotch of willow or alder shrub or else on fallen trunk or stub, elsewhere recorded up to 6 m above ground in conifer. Eggs 3–5 (usually 4), pale greenish-blue with brown and reddish-brown markings; incubation period 12–13 days; nestling period 11–13 days; post-fledging dependence at least 8 days. Oldest recorded bird 7 years 4 months.
Movements. Long-distance migrant. Departure from breeding grounds begins mid-Aug, mostly complete by early Sept. Peak passage in New York second half Sept, in Wisconsin and Illinois mid-Sept, in Mississippi early Oct; passage through Middle America mostly at sea-level on Atlantic coast, late Sept–Nov from S Mexico to Honduras, early Oct to mid-Nov in Costa Rica, late Sept to late Nov in Panama. Migrates into N South America from Sept, mainly Oct. On basis of number of specimens, main wintering area may be S Venezuela and W Amazon Basin; in Colombia recorded early Oct to early May; in Venezuela mid-Oct to early May, birds in Andes being on passage and those S of R Orinoco appearing to be winter residents; site-fidelity shown by wintering birds at Jatun Sacha Biological Station, in Ecuador. Also, winters sparingly in Costa Rica, Panama, and Caribbean islands (e.g. W Cuba, Jamaica), but race involved unknown. Spring return late, present in South America to Apr/May; passage in Middle America mid-Apr to mid-May, mid-May E USA, mid-May to early Jun in Quebec, but slightly earlier inland; arrival on breeding grounds in second half May and early Jun. Arrives early Jun in Siberia. Typically undertakes flights of 300 km (range 200–700 km), with one or more nights' rest between. Vagrants recorded most years in Europe.
Status and Conservation. Not globally threatened. Indirect evidence suggests considerably smaller global population than *C. ustulatus*, given ratios of 1:5 (ringing records, Wisconsin), 1:4 (tower kills, Wisconsin), 1:4 (ringing records, Iowa) and 1:2 (ringing records, Saskatchewan); trends unknown. Nevertheless, capable of strong representation in appropriate habitat, with density in NE Russia of 0·25 pairs/ha in mixed willow–alder floodplain scrub, and in some areas considered one of most abundant birds. Highest recorded density in North America 0·9 pairs/ha (in open white spruce forest). In Neotropical winter quarters seemingly uncommon, but abundance probably masked by reclusive behaviour; fairly common in Venezuela, with large numbers S of R Orinoco.
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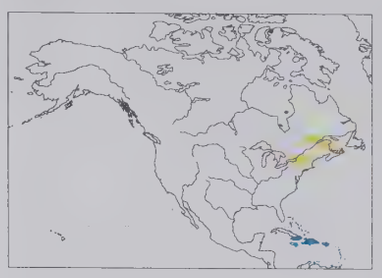
151. **Bicknell's Thrush**

Catharus bicknelli

French: Grive de Bicknell **German**: Bicknelldrossel **Spanish**: Zorzalito de Bicknell

Taxonomy. *Hylocichla aliciae bicknelli* Ridgway, 1882, near the summit of Slide Mountain, Ulster County, New York, USA.
Formerly placed in *Hylocichla*, along with *C. fuscescens*, *C. minimus*, *C. ustulatus* and *C. guttatus*. Until recently treated as a race of *C. minimus*, and separation as a species still a matter of contention; vocal, morphological and even biochemical differences very subtle, and considered by some to have subspecific value only, but seemingly parapatric breeding and probably discrete winter distributions suggest species-level separation just tenable. Nonetheless, intermediates between the two taxa occur, and Newfoundland population of *C. minimus* approaches present species in size and coloration. Monotypic.

Distribution. E Canada and NE USA; non-breeding mainly Hispaniola, also E Cuba, Jamaica and Puerto Rico.



Descriptive notes. 16–17 cm; 26–33 g. Olive-brown above, in S of range more tawny-brown; dull whitish below, with greyish-brown face, indistinct pale eyering, mid-brown malar connecting to band of darkish brown spots on lower buff-washed neck side and breast; bill dark, with extensive yellow basally on lower mandible; legs dull purplish-flesh. Very like *C. minimus*, but usually slightly smaller, tail more chestnut-brown and contrasting more with back, face with thin pale streaks, buffier-washed breast, bill with more extensively pale lower mandible, legs more purplish. Sexes similar. Juvenile as that of *C. minimus*. VOICE. Song, by male from exposed or hidden perch usually high in tree, late May to end Jun, very similar to that of *C. minimus* but higher-pitched, even more nasal and wiry, "ch-ch zreee p-zreeew p-p-zreee" or "chook-chook wee-o wee-o wee-o-tee-t-ter-ee", even-pitched or rising (not dropping) at end; female occasionally gives "whisper song" on nest and at concealed perches away from it, male also in courtship. Calls include highly variable, harsh downslurred whistle, e.g. "beer", "peert" or "quee-a", for contact, higher and less slurred than that of *C. minimus*, becoming a rising and falling "cree-e-e" as nocturnal flight call; rolling chatter or growl, "crr-rr-rr", when agitated; soft low "chook-chook" near nest; soft whining high whistle, "weee", when tending young.
Habitat. Breeds in dense montane forests of balsam fir (*Abies balsamae*), also with red spruce (*Picea rubens*), black spruce (*P. mariana*), white birch (*Betula papyrifera*) and mountain ash (*Sorbus*), above 1100 m in S of range, above 600 m farther N (as low as 450 m in one area of New Brunswick), and usually near tree-line (but less than 75% of apparently good habitat occupied); in Canada also regenerating woodland and lowland coastal spruce–fir formations. In Quebec mountains, occupied sites have significantly more balsam fir, and significantly less spruce and hardwoods, than unoccupied ones, with lower percentage of herbaceous cover, higher percentages of moss ground cover, leaf litter, snags and stumps, and higher tree density. Generally, however, prefers naturally disturbed habitats, and historically probably selected patches of regenerating forest, and edge habitats at upper elevations and in coastal situations; relatively young (average height c. 4 m) mixed stands of regenerating forest with moderate to high stem densities provide important habitat in New Brunswick. Recently found in areas disturbed by logging, ski-trail and road construction; such areas dominated by deciduous trees, mainly white birch. On passage uses variety of habitats, and regularly caught on Virginia coast in upland shrub and dune scrub-forest with loblolly pine (*Pinus taeda*), oak (*Quercus*), myrtle (*Myrica*) and early successional habitats. Winters in moist to wet broadleaf forest (75% of sites), mixed pine–broadleaf montane forest (19%) and pine-dominated forest (6%) in Dominican Republic, these mainly primary (78% of sites) but also secondary (22%), and ranging from sea-level to 2200 m (mainly above 1000 m); males appear to predominate in primary montane forest, females in mid-elevation moderately disturbed forest. In rest of non-breeding range found in wet montane and ridge-line forest, cloudforest, scrub-forest, and upper and lower montane rainforest. Sexual segregation in winter appears to leave females in poorer-quality habitats. Individual territories defended in winter.
Food and Feeding. Invertebrates, almost entirely insects, throughout year, but supplemented in autumn and winter by fruit and berries. Key foods in breeding season beetles, caterpillars and ants. Stomach contents in Jun–Jul held 34% beetles (mainly of families Chrysomelidae, Elateridae, Cerambycidae, Carabidae, Staphylinidae), 29% ants, 12% flies (mainly Tipulidae) and 9% caterpillars, with less than 5% composed of various other invertebrates, including snails and spiders. Caterpillars and other larvae main foods brought to nestlings in Vermont, but beetles and adult hymenopterans also important. Forages on ground or close to it, moving swiftly on foot across leaf litter, pausing and foot-scratching; also gleans from foliage or branches, and occasionally sallies after flying insects and hover-gleans for settled ones. Absence of reports of worms in diet suggests little digging.
Breeding. Jun–Aug; one documented case of two broods. Male not territorial, several males may call and sing in same area, but female apparently territorial; mating system possibly best termed "female-defence polygynandry", as both male and female mate with multiple partners, multiple paternity common (in Vermont, more than 75% of broods fathered by more than two males), and more than one male feeds nestlings. Nest a bulky cup made of twigs and moss, layered with leaf mould, lined with fine stems, horsehair and fungus rhizomorphs; placed 0·5–10 m (mean 2 m) up against trunk or on branch of small tree, usually balsam fir, and usually in dense stands, also in dense regrowth along edges (e.g. 26 nests on average 11 m from ski-trail edge in Vermont), less commonly in more mature open forest. Eggs 3–4, bluish-green with light brown speckling; incubation period 12 (9–14) days; nestling period 11 (9–14) days; post-fledging dependence uncertain, possibly up to 14 days, brood may be divided between adults (once between female and one of two males, once between two males). Nest success often low, average number of fledglings per nest in Vermont 2·1 (Stratton Mt) and 1·5 (Mt Mansfield); of 21 males with known paternity, 62% sired one chick, 19% two, 14% three and 5% four; nests preyed on by red squirrels (*Tamiasciurus hudsonicus*), and many other mammals and birds suspected, but breeding success high in years when cone crop low (as squirrel density also low). Breeds at 1 year, but owing to unusual mating system young males may not breed; in one study, 14% of female breeders were yearlings, but yearling males, despite constituting 25% of male population, achieved only 8% paternity. Annual survivorship in Vermont variable with area, from 54·7% to 94·6%; annual survival rate of winter birds in Dominican Republic (Sierra de Bahoruco) 1994–1999 was 72·9%. Oldest recorded male 8 years, female 7 years.
Movements. Long-distance nocturnal migrant, travelling E of Appalachians in both directions. Details of migratory pattern and schedule lacking, owing to relative scarcity of records referring conclusively to present species (as opposed to *C. minimus*); great majority of autumn records concern first-year birds. In autumn, passage mainly mid-Sept to mid-Oct down E coast, with records ceasing S of Virginia, suggesting direct water crossing to Greater Antilles. Present on wintering grounds in Dominican Republic early Nov to at least mid-Apr. Spring passage takes more overland route, with records in Florida first half of May and good numbers between Maryland and New England mainly in second half of May; most back on breeding grounds by end May. Although site-faithful on breeding and wintering grounds, evidence suggests considerable dispersal of yearling birds away from natal areas.
Status and Conservation. VULNERABLE. CMS Appendix II. Global population assessed at 21,000–53,000 mature individuals, of which 20,000–50,000 in USA and 1000–3000 in Maritime Provinces of Canada, but also a small population in Quebec. Average density in regenerating forest in New Brunswick 16 pairs/km². Threatened by habitat loss and deterioration, and population forecast to continue to decline and fragment. Slight range contraction recorded in Canadian Maritime Provinces between mid-1980s and mid-1990s. Acid rain thought to have damaged breeding habitat

during 1960–1980, and global warming may eliminate US habitat (montane spruce–fir) by 2050. Thinning of trees renders habitat unsuitable in Quebec; local threats to habitat are developments such as ski resorts, wind-farms and telecommunications buildings. Evidence of use of disturbed forest habitats, however, suggests that some local declines and extinctions merely reflect the species' natural shift away from increasingly mature growth into new areas; now known to benefit from some habitat disturbance. In winter quarters, where possible segregation of habitat by sex may be cause of documented strong male bias in sex ratio, forested areas being fragmented by logging and clearance for farmland and charcoal, and this may be far more serious threat than anything on breeding grounds: several reported historical sites in Dominican Republic appear now too degraded to be suitable for the species. Important ongoing studies are clarifying the species' requirements in both summer and winter quarters, and some important breeding areas and 50% of known sites in Dominican Republic are actively protected, but further protected areas are needed in latter. Regular in Turquino National Park, in Cuba, and in Macaya National Park, in Haiti.

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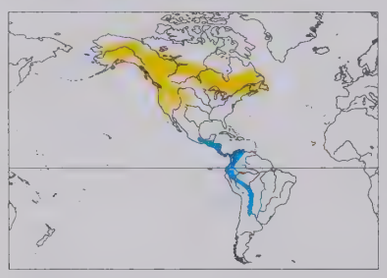
152. Swainson's Thrush

Catharus ustulatus

French: Grive à dos olive **German**: Zwergdrossel **Spanish**: Zorzalito de Swainson
Other common names: Russet-backed Thrush (nominate); Olive-backed Thrush (*swainsoni*)

Taxonomy. *Turdus ustulatus* Nuttall, 1840, forests of the Oregon = Fort Vancouver, Washington, USA. Formerly placed in *Hylocichla*, along with *C. fuscescens*, *C. minimus*, *C. bicknelli* and *C. guttatus*. Races fall into two groups, russet-backed "nominate group" (also with *phillipsi* and *oedicus*) and olive-backed "*swainsoni* group" (also with *incanus* and *appalachiensis*); these differ not only in morphology but also in breeding habitat, certain vocalizations and wintering areas, but separate species status for the two has not, apparently, been mooted. Proposed race *almae* synonymized with nominate. Six subspecies recognized.

Subspecies and Distribution.
C. u. incanus (Godfrey, 1952) – C & E Alaska and W Canada; non-breeding Colombia and Venezuela S to Peru.
C. u. swainsoni (Tschudi, 1845) – C & E Canada and N USA; non-breeding South America.
C. u. appalachiensis Ramos, 1991 – E USA; non-breeding Colombia S to NE Peru.
C. u. ustulatus (Nuttall, 1840) – Pacific coast from SE Alaska S to N California and N New Mexico; non-breeding Mexico S to Panama.
C. u. phillipsi Ramos, 1991 – Queen Charlotte Is (W Canada); non-breeding E & W Mexico.
C. u. oedicus (Oberholser, 1899) – SW USA (California); non-breeding W Mexico S to Nicaragua.



Descriptive notes. 16–20 cm; 25–45 g. Nominate race is olive-tinged grey-brown above, dull whitish below, with slightly greyish face, buffy-cream eyering, lores and throat, dark brown malar connecting to band of dark brown spots on lower (buff-washed) neck side and breast; bill dark, small pinkish area at base of lower mandible; legs dull flesh. Very like *C. minimus*, but more buffy-cream around face, browner cheeks, darker upperparts, shorter bill. Sexes similar. Juvenile is very like juvenile *C. minimus* except for distinctive lores and eyering; first-year has pale-tipped greater wing-coverts. Race *phillipsi* is redder than nominate, with fewest spots below; *oedicus* is like nominate but paler and greyer above; *swainsoni* is paler, colder, more olive above than nominate; *appalachiensis* differs from previous in being darker and more rufous; *incanus* differs in being greyer above than *swainsoni*, with slightly more rufous tail. Voice. Song, by male only, typically at dawn and dusk from exposed perch in middle to upper canopy, and often only after several weeks on breeding grounds (e.g. from second week of Jun in Idaho), a lovely series of a fluty melodic upward-spiralling phrase (starting with low quiet trill), "wh'wheedl-oo wheedl-oo wheedl-oo", each repeated set of notes slightly louder and longer than preceding one; occasionally softly, as "whisper song"; song of russet-backed group (at least in California) more nasal, longer and more complex than that of olive-backed group. In non-breeding quarters regularly gives faint version of song, especially on N passage in Mar–Apr. Calls include mellow, liquid, upslurred sharp "whit" or "pwick" in alarm; hollow emphatic "heep" or "hwee" or "fweep" for contact (flight call commonly heard on migration); burry "rrehrr", also in alarm or attack, and often combined with "whit" call to make "whit-burrr"; thin, high single whine, conveying anxiety; "bink"; and drawn-out metallic "peeeeeer"; russet-backed group reportedly has burry descending "vreew" like that of *C. fuscescens*, not known for olive-backed group.

Habitat. Mainly coniferous forests of spruce (*Picea*) and fir (*Abies*); coastal douglas fir–hemlock (*Pseudotsuga–Tsuga*) forest in Pacific Northwest, cedar–hemlock (*Thuja–Tsuga*) and mixed-conifer forests in N Rocky Mts, boreal spruce–fir forest and mixed hardwood–conifer forest across Canada to New England, and spruce–fir and fir forest in New Mexico. In SW USA chiefly in deciduous riparian woodlands, including thickets of willow (*Salix*), alder (*Alnus*) and aspen (*Populus*), also coastal scrub and various montane formations. Mistakenly regarded as confined to mature growth; often equally high densities found in early succession formations, including closed-canopy plantations, regenerating (4–20 years old) conifer stands. Generally requires closed-canopy forest with sparse to moderate understorey, some conifers and relatively small inter-tree distance. Elevation varies with habitat and latitude: below 150 m in California; sea-level to 930 m (mainly 100–400 m) in coastal W Canada, to 1850 m in interior; 1400–2600 m in interior SW USA; 800–1200 m in NE USA. Outside breeding season more often in disturbed areas of forest with dense undergrowth; in S USA found in chaparral, riparian forest, canyon bottoms, young woodland, swamp-forest, lake edges and parks. In winter quarters in Middle America occurs in humid to semi-humid evergreen and semi-deciduous forest (most abundant in thorn-forest in Colima, in Mexico), thickets, old second growth with herbaceous shrubs and small trees, and forest-pasture edge, mainly at 300–2000 m (some down to sea-level, but in Costa Rica not above 1500 m); on passage in region ranges into other habitats, including urban areas and open country, to 3000 m. On non-breeding grounds in South America occupies humid and montane forest (sometimes primary forest, e.g. in E Ecuador, S Peru), forest borders, riparian thickets, shade coffee, secondary and light woodland and adjacent clearings, and gardens, from lowlands to 2000 m (but preferring slopes); higher on passage, with exceptional record at 3800 m in Ecuador (on Volcán Pichincha) in Nov; in Venezuela, 800–2300 m N of R Orinoco and 0–150 m S of it.

Food and Feeding. Invertebrates and fruit, former mainly in spring (92%) and summer, latter mainly in autumn (64%) and winter. Invertebrate prey largely insects, including beetles, caterpillars, ants, flies, grasshoppers and bugs; spiders less frequent than in diets of congeners. In NE hardwood areas, main prey items adult beetles and ants, but with facultative switch to exploit caterpillar outbreaks; an important controller of spruce budworm moth (*Choristoneura fumiferana*) in E & W conifer forests. In study in summer quarters, diet 63·5% animal matter and 36·5% plant matter, former breaking down as 16% beetles, 15% ants, 11% bugs, 10% caterpillars, 6% hymenopterans and 6% flies; fruits consisted of elderberry (*Sambucus*), blackberry and raspberry (*Rubus*), twinberry (*Lonicera*), huckleberry (*Vaccinium*), brier (*Smilax*), sumac (*Rhus*) and others. Analysis of 34 stomachs in breeding season, NE USA, found 40% beetles (primarily Elateridae), 33% ants, 9% caterpillars and 9% flies. Nestling diet in one study 93% animal, mainly caterpillars, beetles, moths, flies and bugs. In non-breeding season primarily frugivorous, notably so at migration times; berries (e.g. of *Lantana*), arillate seeds, *Cecropia* catkins, and fruits found in stomachs, but one migrant also held a few beetles and large flies; in Panama found to take good numbers of termites, millipedes, hymenopterans and insect larvae. In Mexico (Sonora), recorded as eating *Bumelia* and *Bursera laxiflora*. Mainly a near-ground forager, using forest floor and lower storey, gleaning from ground and leaves, mean foraging height lower in subalpine habitats (1·4 m) than hardwood (2·7 m); also forages in canopy more than do congeners. Pecks and gleans, also makes aerial lunges and sallies, and hovers more often than gleans in hardwood forests. Typically, perches on low twig and dives on terrestrial prey. Sometimes uses foot-trembling in leaf litter. In winter forages at low to middle heights, relatively infrequently descending to ground, but may attend army-ant swarms (e.g. regularly so on Barro Colorado I, in Panama). In non-breeding season sometimes forms large flocks in and near fruiting trees, and sometimes joins mixed flocks, mostly in middle storey or lower. May hold winter feeding territory, but perhaps only in areas (e.g. Colombia) where resources evenly spread; birds in Veracruz, in Mexico, Dec–Jan, had high fat loads, suggestive of dependence on patchy resources.

Breeding. Apr–Aug; evidence of double-brooding not conclusive; only one clear case of second clutch after first successfully fledged. Territory size 2·1 ha in spruce forest, 1 ha in wet black spruce (*Picea mariana*) and 1 ha or less in mixed-conifer forest. Nest a small to bulky cup of grasses, stems, moss, bark and twigs, lined with leaves, rootlets, horsehair fungus, lichen and/or moss, placed usually in shaded understorey, particularly in shrubby deciduous thicket, or conifer sapling, less frequently more than 3 m up on horizontal branch away from bole of tree (height of 981 nests 0–24 m, but 60% between 1 m and 2·4 m, with higher placement associated with conifer forest); in New York uses eastern hemlock (*Tsuga canadensis*), and nests on average 5·8 m above ground; in Idaho and Vermont, nests found more in areas with denser shrubs and saplings, greater number of large firs and greater canopy cover than random; in coastal California, nest-sites (and breeding success) associated with canopy cover, red alder (*Alnus rubra*) density and swordfern (*Polystichum munitum*) cover, and more than 30% of nests placed in blackberry. Eggs 1–5, mainly 3–4, blue to greenish-blue with reddish or brown speckles; incubation period 10–14 days; nestling period 10–14 days, but 12–14 days when undisturbed. Brood parasitism by Brown-headed Cowbird (*Molothrus ater*) generally low, in California maximum incidence 8%. Successful nests as percentage of total nests varies by region, 18–48%; suffers nest predation both by mammals and by other birds. Presumed to breed at 1 year of age; relatively high natal site-fidelity, 18% of juveniles at one site recaptured there in later years. Annual survival in various studies 0·42% to 0·77%; survival rates from ringing recoveries 56% for adults and 26% for juveniles (latter probably an underestimate owing to dispersal); in another population, return rate of first-year birds 18·3%, considered comparatively very high and apparently influential on productivity of adults. Oldest recorded bird at least 10 years.

Movements. Long-distance migrant; entire population migrates to Central America and South America (S Mexico S to N Argentina). Nearctic and Neotropical ringing and genetic data show nearly complete segregation of migratory routes and overwintering locations: C & E populations migrate along E route to overwintering sites in Panama and South America, whereas W coastal populations migrate along Pacific coast to Central America and Mexico. Autumn migration of E populations proceeds mainly down E coast of USA mid-Aug to early Oct (many therefore flying thousands of kilometres E before turning S), and probably involves crossing of Gulf of Mexico (at least by adults; first-years may hug the coast), although in spring these populations appear to return up W coast of Gulf or make shorter W crossing of it, then (early Apr to mid-May) fanning out on broad front as they move farther N; rare records from Cuba mid-Sept to late Nov and mid-Mar to early May. Autumn migration of W populations mainly late Aug to Oct, peak mid-Sept; in spring these populations appear to use Pacific coast of Mexico and California before rapidly moving inland and farther N, so that peak in S California mid-May and in Vancouver in second half May. Passage migrant throughout Middle America Sept–Oct and Apr–May; in Costa Rica mid-Sept to Nov, largely on Atlantic slope (Pacific slope only from Oct), and Apr to late May on both slopes; in Panama passage occurs Oct–Nov (some mid-Sept) and Mar–Apr, with stragglers to mid-May. Generally rare migrant in Caribbean, Sept–Nov and Mar–May. Visitors present in South America, mainly Oct–Apr, e.g. mid-Oct to mid-Apr in Colombia, late Oct to late Mar in Venezuela. Evidence suggests that return movement begins as early as mid-Jan in S (Bolivia, Peru). Can be very numerous along E base of Andes in Ecuador during passage in late Oct and again in Mar.

Status and Conservation. Not globally threatened. Generally abundant, widespread but declining species. Population of Maritime Provinces of Canada (New Brunswick, Nova Scotia and Prince Edward I) c. 430,000 pairs in 1992. Densities variable, but with very approximate value of 1 pair/ha in optimal habitat: examples range from 1·4 males/ha to 0·24–0·29 birds/ha, and from 1·2 territories/ha to 0·5–0·8 territories/ha; possibly highest densities in N Rocky Mts and Yukon. Considerable contraction of range in California in past 100 years, attributed to loss of lowland riparian habitat and cowbird parasitism, but disappearance from some areas inexplicable by these factors; decline in Massachusetts in early 20th century due to spruce clearance. In period 1966–1979, annual increase of 3% in North America, mainly in Canada, but overall annual decline of 0·8% for period 1980–1996. Various local studies, including at migration points, reflect declines in recent years. Regions exhibiting declines hold "*swainsoni* group", which winters in South America, but unclear if causes lie there (forest loss) or in North America (modern forest-management regimes); responses to various types of logging in boreal forest usually negative, and species is generally less abundant in more fragmented habitats. Moreover, several studies suggest that local influences in breeding areas, not those on wintering grounds, are responsible for changes in numbers. In non-breeding areas, a fairly common migrant and winter visitor in Honduras, and abundant migrant but rare winter visitor in Costa Rica; in Panama, common to locally abundant autumn migrant (comprising 76% of all migrant thrushes netted in Bocas del Toro during autumn 1963) and fairly common to common spring migrant, but uncommon to rare winter visitor. In South America, fairly common to common; commonest in montane areas, especially on Andean slopes (e.g. E Ecuador, both slopes in Peru), less numerous in lowlands, where mainly a passage migrant; fairly common

passage migrant and uncommon winter visitor in Venezuela. Substantial numbers of migrants killed by flying against large towers and buildings.

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153. Hermit Thrush

Catharus guttatus

French: Grive solitaire **German**: Einsiedlerdrossel **Spanish**: Zorzalito Colirrufo

Taxonomy. *Muscicapa guttata* Pallas, 1811, Kodiak Island, Alaska, USA.

Formerly placed in *Hylocichla*, along with *C. fuscescens*, *C. minimus*, *C. bicknelli* and *C. ustulatus*. Races form three groups, differing in size and plumage coloration: Pacific coast W group (nominate, *nanus* and *slevini*) typically small, brown above, with grey-washed flanks; interior mountain W group (*sequoiensis*, *polionotus* and *auduboni*) typically large, greyish and paler above, with more extensive and contrasting spotting below; and E group (*faxoni* and *crymophilus*) typically mid-sized, dull brown above, flanks washed tawny-buff. Up to 13 races have been described, but geographical variation to some extent clinal; *euborius* is regarded as synonymous with nominate, *jewetti* and *oromelus* with *slevini*, *munroi* with *auduboni*, and *osgoodi*, *verecundus* and *vaccinius* with *nanus*. Eight subspecies currently recognized.

Subspecies and Distribution.

C. g. guttatus (Pallas, 1811) – S Alaska and W Canada; non-breeding W USA and N & C Mexico.

C. g. nanus (Audubon, 1839) – SE Alaska and W Canada; non-breeding W USA, NW Mexico (Baja California).

C. g. slevini (Grinnell, 1901) – W coast of USA; non-breeding NW Mexico.

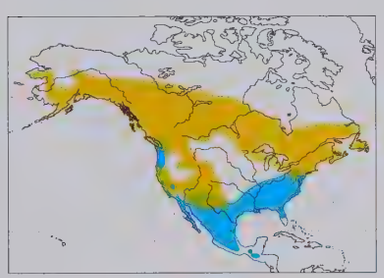
C. g. sequoiensis (Belding, 1889) – mountains of SW USA, also NW & N Mexico in N Baja California (Sierra San Pedro Martir) and Chihuahua; non-breeding SC USA and N Mexico.

C. g. auduboni (S. F. Baird, 1864) – Rocky Mts of WC Canada and NW USA; non-breeding WC USA and Mexico S to Guatemala.

C. g. polionotus (Grinnell, 1918) – Rocky Mts of NC USA; non-breeding W Mexico.

C. g. faxoni (Bangs & Penard, 1921) – EC & E Canada and E USA; non-breeding SE USA and NE & EC Mexico.

C. g. crymophilus (Burleigh & J. L. Peters, 1948) – Newfoundland and adjacent areas; non-breeding SE & SC USA.



Descriptive notes. 16–18 cm; 18–37 g. Nominate race is rufous-tinged greyish-brown above, shading warmer on rump and dull rufous-brown on tail, with warm brown edges of primaries; whitish below, washed buff on breast, band of dark brown spots on lower neck side and breast, flanks washed grey; underwing deep brown with whitish bases of flight-feathers (broad dark and light wingstripes in flight); bill dark, pale base of lower mandible; legs flesh. Sexes similar. Juvenile is very like juvenile *C. minimus*, but with rufous-brown tail. Race *nanus* is smaller and slightly darker than nominate, flanks darker grey; *slevini* is smaller than nominate, paler above, with fewer spots below; *sequoiensis* is larger than previous, pale above, with few but larger spots below; *auduboni* is largest, crown to scapulars greyish-olive, tail duller, whiter below, flanks paler, vent buff when fresh; *polionotus* is very close to last, but weaker greyish-olive above, with white undertail-coverts; *faxoni* is brightest, having slightly warmer brown upperparts, rustier edges of wing-coverts, occurs as two morphs, one with dull brown head becoming warmer dorsally, other more grey-brown overall; *crymophilus* is darker above than last. Voice. Song, by male, commonly from top of tall conifer, a series of short (1·5–2 seconds) rich fluty warbles, "wheeee ti-heedle-i-heu" or "wheeeu heedle-i-eeu" ("Ooh, holy holy–ah purity-purity–ee sweetly-sweetly"), phrases similar but not identical to one another (6–12 discrete song types identified, given in regular sequences but with order varying among singers); on Pacific coast song a little higher, harsher and more mechanical-sounding, with downslurred buzzy introduction. "Whisper song" given in winter quarters and in early spring. Calls include low, soft, dry "chup", often rapidly repeated, possibly hostile; nasal whining upslurred "wiiiih" or "vreeeh"; "siiiiip" in low-level threat or fear; "iiii" in greater alarm; "chup-lisp" in warning to young; nasal "aaaank" in winter; "quit quit" when turning eggs; "pweet pweet" between nesting partners; soft "prrt" only on migration; normal flight call a clear plaintive whistle, "peew". Snaps bill loudly in hostile display; winnowing wing sound during flying attacks.

Habitat. Breeds in arctic–alpine woodland, boreal forests, aspen parkland, coniferous and mixed deciduous–conifer forests, Pacific temperate rainforest; favours edges and clearings, e.g. around pools or meadows, along tracks and utility cuts. Shrub patchiness and tall shrubs (notably *Alnus crispa*) with large crowns are key characteristics in Alaska; in E of range tends to occupy drier tracts of forest than those used by congeners or *Hylocichla mustelina*, but in both wet and dry habitats in Ontario; W of Rockies, uses drier upper edge of forest with park-like openings and shrub patches at higher elevations, but at lower elevations selects moist sites at margins of wetlands and streams. In recent review, most nests (93%) were located in forest habitats, with few (5%) in wet areas, and very few (2%) in open areas such as barren lands, golf courses, upper beaches; within forest habitats, 33% were in mixed, 25% in conifer, 24% in deciduous and 18% in unspecified type. In Appalachian Mts, greatest concentrations occur in mid-successional forests with extensive canopy cover. Breeds from sea-level to 1380 m (mean 200 m) E of Rockies, to 3500 m (mean 1670 m) W of Rockies. In Baja California, in Mexico, breeds in conifer–aspen forest at 2700 m. In winter, found in moist extensive open woodland, pine forest with brushy undergrowth, forest edges, riparian thickets, woodlands with moderate understorey, notably with broadleaf evergreens, but with key requirement for dense berry-bearing vegetation (as often found in ravines and other sheltered sites); bottomland hardwood habitats in SE USA may be particularly important. Wintering birds in Middle America occupy pine–oak and oak forest, although on migration other habitats may also be used; sea-level to 3500 m, mainly above 1000 m.

Food and Feeding. Mainly animal matter in spring and summer (93–99%); high proportion of vegetable matter in autumn and winter (44–60%). Diet of breeding birds in New Hampshire 65% beetles (of families Carabidae, Elateridae, Cantharidae, Curculionidae, Cerambycidae, Scarabaeidae), 20% caterpillars, 12% hymenopterans (mainly ants), 2% flies and 1% bugs. In winter in Mexico (Sonora) fond of most wild fruits, including hackberries; defends small territory 0·55 ha in size. In SE Louisiana highly frugivorous over winter, but switches to arthropods just prior to spring migration. Forages in shady leaf litter, but also in low foliage, on branches and in air.

Breeding. End Apr to end Aug, average first-egg date 15th Jun (± 19 days); at least occasionally double-brooded (in one study, in years of early snow-melt), but phenomenon may be commoner but undetected. Territory size in Ontario 0·7 ha (range 0·06–3·3 ha). Nest a bulky structure of grasses, leaves and other vegetable material, with mud added, lined with pine needles, rootlets and other soft material, in areas E of Rockies generally placed on ground (of 557 documented nests, 89% covered, under tree, shrub, sapling, fern, grass clump, herb, moss or sedge); W of Rockies from ground (30% of cases) to 2·5 m (rarely, more than 6 m) up in small tree, mostly conifer. Eggs 3–6, average 4, plain pale blue to greenish-blue, with occasional brown flecks or spots; incubation period 12 days (range 11–13 days); nestling period 12 days (range 10–15 days). Incidence of brood parasitism by Brown-headed Cowbird (*Molothrus ater*) 4·7% E of Rockies and 1·5% W of Rockies. Average number of young fledged per nest 1·23 E of Rockies, 2·33 W of Rockies; nest failure greater with proximity to forest edge, but nest density also greater; probable nest predators are squirrels, chipmunks and weasels, and Sharp-shinned Hawks (*Accipiter striatus*) commonly take newly fledged young. Age of first breeding probably 1 year. Oldest recorded individual at least 8 years 8 months.

Movements. Migrant or partial migrant; unclear if some populations resident. Generally a short-distance migrant; mainly nocturnal, but more diurnal than congeners. In autumn, peak passage E of Rockies late Sept to mid-Oct; W of Rockies breeders depart Aug, sometimes followed by dip in abundance until N migrants arrive Sept-Oct. Present in Mexico and N Central America mid-Sept to May; rare winter visitor in N Bahamas Oct–Apr; two records in El Salvador. In spring, peak passage E of Rockies late Mar to early Apr in S, mid-Apr to mid-May in N; W of Rockies dates vary with latitude and also altitude, peak in SW Canada Apr, up to a month later farther N. Rare vagrant in Greenland and Europe.

Status and Conservation. Not globally threatened. Fairly common. In Canadian Maritime Provinces, breeding population estimated at 282,000 pairs. Nesting densities variable with habitat; optimally, may reach 1·9 territories/ha in mixed coniferous forest in Arizona. Evidence of positive trend in population in period 1966–1991 (North American Breeding Bird Survey), possibly owing to extension of forest edges through clearance, roads and utility cuts; significant increases occurred in California, Washington, Wisconsin, Michigan, New York, New Hampshire, Massachusetts, Quebec and Nova Scotia. Migration indices at Long Point Bird Observatory (Ontario) reveal significant overall increase of 1·26% per year during 1961–1994. Decline in Pennsylvania c. 1900 coincided with height of lumber extraction, and increases there since 1945 reflect natural regrowth and maturation of conifer tracts planted in 1930s. Main threat is degradation of habitat; mortality caused by flying against towers and other major structures may be secondarily important. Fairly common but local breeder in NW Mexico.

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PLATE 65

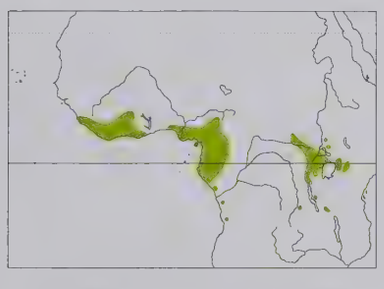
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Subfamily SAXICOLINAE
Tribe SAXICOLINI
Genus *PSEUDALETHE* Beresford, 2003

154. **Brown-chested Alethe**
Pseudalethe poliocephala

French: Alèthe à poitrine brune **German**: Braunbrustalethe **Spanish**: Alete Pechipardo
Other common names: Brown-crowned Alethe

Taxonomy. *Trichophorus* (*Criniger*) *poliocephalus* Bonaparte, 1850, Dabocrom, Ghana.
Genus only recently split from *Alethe*. May form a superspecies with *P. poliophrys*, *P. fuelleborni* and *P. choloensis*. Considerable confusion regarding type locality and subspecific nomenclature: type locality was claimed to be Bioko, apparently due to misunderstanding; under such an arrangement the Bioko race was considered nominate *poliocephala*, while westernmost race bore name *castanonota*; type series convincingly shown not to have come from Bioko, but very probably from Ghana, and plumage of syntypes matches skins from there; type locality thus emended, westernmost race becoming nominate, with Bioko race adopting name *compsonota*. Described race *nandensis* (from W Kenya) considered synonomous with *carruthersi*. Nine subspecies recognized.
Subspecies and Distribution.
P. p. poliocephala (Bonaparte, 1850) – Sierra Leone E to Ghana.
P. p. compsonota (Cassin, 1859) – S Nigeria, Cameroon and SW Central African Republic S to NW Angola, and also Bioko I (Fernando Póo).
P. p. hallae (Traylor, 1961) – W Angola (Quicolungo, Gabela).
P. p. giloensis (Cunningham-van Someren & Schifter, 1981) – S Sudan.
P. p. carruthersi (Ogilvie-Grant, 1906) – SE Central African Republic, NE DRCongo, Uganda and W Kenya.
P. p. akeleyae (Dearborn, 1909) – Kenya E of Rift Valley.
P. p. vandeweghei (Prigogine, 1984) – Rwanda and Burundi.
P. p. kungwensis (Moreau, 1941) – Mt Kungwe, in W Tanzania.
P. p. ufipae (Moreau, 1942) – SE DRCongo (Upemba National Park) and SW Tanzania (Ufipa Plateau).

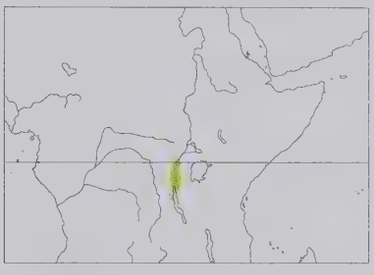


Descriptive notes. 15–16 cm; 22–38 g. Nominate race has crown dark grey, whitish-grey supercilium, blackish-brown ear-coverts, reddish-brown mantle, wings and rump; blackish tail and inner webs of flight-feathers; broad white chin and throat, pale buff-brown breast and flanks, whitish belly to vent; bill black; legs flesh. Sexes similar. Juvenile has neat rufous-buff flecks on crown to nape and ear-coverts, large orange-rufous spots on rest of upperparts, blackish and rufous-buff fringes on breast. Race *compsonota* is brighter chestnut above (on Bioko, appears to have darker head and richer-coloured back), with brownish ear-coverts; *hallae* has crown reddish-olive, ear-coverts pale chestnut, back tinged olive; *giloensis* has top and sides of head blackish, ear-coverts browner, back to rump cinnamon-brown, distinct light drab breastband, belly washed grey-brown, flanks darker greyish-brown; *carruthersi* is like nominate but paler grey on head, less intense chestnut (more rufous) above; *akeleyae* is similar to last but larger, greyer on head and face, olive-tinged above, duller below; *vandeweghei* is also similar but larger, and paler above, weaker breastband; *ufipae* is slightly redder above, crown olive-brown; *kungwensis* is darker and redder above than last, crown olive-washed grey. Voice. Generally very silent. Song a series of a standard phrase consisting of 5–10 pure mournful whistles, descending scale and with volume diminuendo, alternating single with double notes, e.g. "pu-pii…pii…tu-tii… pii… pu-pii…". Subsong a quiet buzzy "reiz-eiz-serrt-serr-riz-sez-seees" or "razz-raah-zaeid-zerr", once given by released ringed bird. Call "tu-iit" by pair for contact, also hollow "keu"; growling "raagh" and "seiz-seiz-seiz" in aggression at ant swarms; rising whistled "siiiiiiiiih", accompanied by wing-flashing, in alarm; and "ip-ip-ip-ip" chatter like that of Grey-headed Bristlebill (*Bleda canicapillus*) when nest approached by human.
Habitat. Primary lowland, transition and lower montane forest, swamp-forest and gallery forest, old secondary growth and forest–grassland mosaic; especially on sloping ground near streams in undergrowth and on forest floor. Reaches 1500 m in Liberia, 2200 m in Cameroon, 800–2000 m on Bioko, 1100 m in Angola, 2500 m in Sudan, 1900 m in DRCongo and 2800 m in E Africa.
Food and Feeding. Only animal food recorded, almost all invertebrates: insects and their larvae (beetles, termites, ants, mantids, mole-crickets), millipedes, spiders, small molluscs and tiny frogs. Forages on ground and fallen logs in dense undergrowth; also from low perch, dropping to ground to snatch prey and returning to vantage point. Also gleans from foliage, trunks, logs and lianas, mainly below 4 m from ground. Regularly follows ant swarms, up to twelve individuals waiting ahead of column to catch fleeing arthropods; repeatedly flashes one or both wings vertically upwards, and interacts aggressively with conspecifics and other species. Often joins mixed-species flocks away from ant swarms. Often crepuscular.
Breeding. Jul in Sierra Leone; breeding-condition birds May–Jun and juveniles Jun–Sept (some Oct–Jan) in Liberia; breeding-condition bird Sept in Ghana; juveniles or birds with brood patches Nov–Jan and Apr–Sept (slight peak Jul) in Cameroon; probably Oct–Jun in Gabon; juveniles Oct–Apr on Bioko; breeding condition Aug in Angola; Sept–Apr and juveniles Jul in DRCongo; breeding-condition bird Jun in Central African Republic; Mar in Sudan; Mar–May and Oct–Nov in E Africa. Nest a deep cup of moss, sometimes mixed with rootlets and *Marasmius* fungus strands, placed 1–7 m up in cavity such as tree hole or stump top. Eggs 1–3, green, greenish-brown or chocolate-brown with chestnut and violet-grey spots; incubation period at one nest 16 days. Of four nests with eggs in Gabon, three were preyed on and one abandoned. Ringed bird controlled after 10 years and 1 month.
Movements. Sedentary. Ringed individual in Kenya recaptured after nine years only 100 m from site where first trapped.
Status and Conservation. Not globally threatened. Common to abundant overall, but considered uncommon to scarce in W Africa and parts of WC Africa. Common on Bioko, especially in primary forest below 1200 m. Density of 6–7 pairs/km² in Gabon. Common in Imatong Mts, in Sudan. In Kenya, fairly common (race *carruthersi*) W of Rift Valley, including in Saiwa National Park, and one of most characteristic birds of Kakamega–Nandi Forest; race *akeleyae* generally scarce, and no longer present in Nairobi suburbs (last nest 1976). S races *kungwensis*, *ufipae* and *hallae* and N *giloensis* have highly restricted ranges, and status of each therefore less secure. Indications that in DRCongo and Uganda this species is sensitive to forest disturbance; in one study in Budungo Forest (Uganda), it was one of two species found particularly to avoid forest gaps.
Bibliography. Bannerman (1953), Beresford (2003), Borrow & Demey (2001), Brosset & Érard (1976, 1986), Chapin (1953), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Cunningham-van Someren (1977), Dean (2000), Dowsett & Dowsett-Lemaire (1997), Eisentraut (1973), Gatter (1997), Gaugris *et al.* (1981), Gichuki & Schifter (1990), Keith *et al.* (1992), Lippens & Wille (1976), Mann (1974), Mees (1988), Ngabo & Dranzoa (2001), Nikolaus (1987), Pérez del Val (1996), Plumptre & Mutungire (1996), Prigogine (1971, 1984a), Rodewald *et al.* (1994), Sinclair & Ryan (2003), Stuart (1986), Thiollay (1985), Traylor (1961), Vande weghe (1988), Willis (1986), Zimmerman (1972), Zimmerman *et al.* (1996).

155. **Red-throated Alethe**
Pseudalethe poliophrys

French: Alèthe à gorge rousse **German**: Rotkehlalethe **Spanish**: Alete Gorgirrojo

Taxonomy. *Alethe poliophrys* Sharpe, 1902, Ruwenzori, Uganda.
Genus only recently split from *Alethe*. May form a superspecies with *P. poliocephala*, *P. fuelleborni* and *P. choloensis*. Two subspecies recognized.
Subspecies and Distribution.
P. p. poliophrys (Sharpe, 1902) – NE & E DRCongo, W Uganda, W Rwanda and W Burundi.
P. p. kaboboensis (Prigogine, 1957) – Mt Kabobo, in E DRCongo.



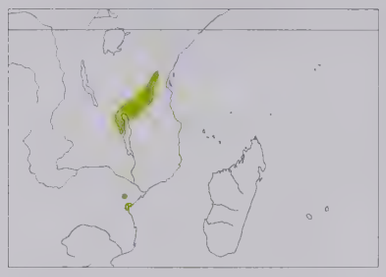
Descriptive notes. 15 cm; 30–45 g. Nominate race has black crown encircled by broad grey line from forehead through supercilium to nape; mantle to rump rufous-chestnut, wings and tail dark brown with rufous-chestnut fringes; face, including chin, greyish-black, throat orange-rufous, breast brownish-white, shading to whitish on belly and vent; bill black; legs pale greyish-pink. Sexes similar. Juvenile is blackish with pale orange streaks above, wing-coverts tipped pale orange and black, blackish below to belly with neat buff streaking, shading to off-white lower belly and vent. Race *kaboboensis* is browner, less rufous, above, paler throat. Voice. Song, given noisily and monotonously, consists of single downslurred whistle, "piiiyuu" (pure) or "piiiyurr" (burry), or single even whistle with slight central rise, "wuuiiyuu", repeated every 2–3 seconds; sometimes different whistles delivered close together in more continuous song; one heard to imitate 2-note call of Black-tailed Oriole (*Oriolus percivali*). Call for contact in mixed flock same as song note; in alarm a soft "raa-chaa-chaa-chaa-chaa" and soft chirping "wer".
Habitat. Montane forest, high-altitude gallery forest and wooded ravines, at lower edge of bamboo zone, 1300–3000 m. Keeps to dense undergrowth.
Food and Feeding. Invertebrates, including insects such as beetles, flies and army ants, spiders, earthworms and snails. Forages on ground in short rushes at exposed prey, sometimes also tossing aside leaves; occasionally flying up to glean prey from trunks and lianas. Follows ant swarms, keeping ahead of column; also joins mixed flocks, especially in dry season.
Breeding. Sept–Oct in Rwanda; Mar in Uganda; Sept–Jul, probably all year, in DRCongo. Nest a cup of green moss lined with dry moss stems, low off ground in natural cleft. Eggs 2, dark green with brownish speckles. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Albertine Rift Mountains EBA. Common within restricted range.
Bibliography. Beresford (2003), Chapin (1953), Dowsett (1990), Kalina & Baranga (1991), Keith *et al.* (1992), Lippens & Wille (1976), Prigogine (1971), Sinclair & Ryan (2003), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Willis (1985).

156. **White-chested Alethe**
Pseudalethe fuelleborni

French: Alèthe à poitrine blanche **German**: Weißbrustalethe **Spanish**: Alete Pechiblanco
Other common names: White-breasted/Fuelleborn's Alethe

Taxonomy. *Alethe fülleborni* Reichenow, 1900, Peroto-Ngosi, Tandalla, Tanzania
Genus only recently split from *Alethe*. May form a superspecies with *P. poliocephala*, *P. poliophrys* and *P. choloensis*. Varies clinally in size, and considerable individual variation in back colour exists. N populations described as race *usambarae*, on basis of general absence of scaling on breast, but this character not constant. Monotypic.
Distribution. NE Tanzania S to extreme NE Zambia and N Malawi, and SC Mozambique.
Descriptive notes. 17–20 cm; 42–58 g. Has grey-brown crown, with forehead to eye diffusely grey, lores blackish, ear-coverts blackish-brown; mantle olive-brown, shading to chestnut-brown on wing-coverts, rump and tail; blackish-brown wings with rufous-brown edging; white below,

On following pages: 157. Thyolo Alethe (*Pseudalethe choloensis*); 158. White-tailed Alethe (*Alethe diademata*); 159. Fire-crested Alethe (*Alethe castanea*); 160. Collared Palm-thrush (*Cichladusa arquata*); 161. Rufous-tailed Palm-thrush (*Cichladusa ruficauda*); 162. Spotted Palm-thrush (*Cichladusa guttata*); 163. Gould's Shortwing (*Heteroxenicus stellatus*); 164. Rusty-bellied Shortwing (*Brachypteryx hyperythra*); 165. Lesser Shortwing (*Brachypteryx leucophris*); 166. White-browed Shortwing (*Brachypteryx montana*).



dusky scaling on breast (often lacking in N of range), dark grey-brown neck side, cinnamon-brown breast side and flanks, latter mixed with grey; bill black; legs pinkish-grey. Sexes similar. Juvenile is blackish-brown with pale orange spots above, whitish with dusky scaling below, breast blackish with pale orange spots. VOICE. Song in Malawi a series of a standard phrase made up of varied pure and trilled whistles, each c. 1 second apart, "wuuiiuuu... piiuu... wiiowip... torwiiyurr... pwiiurr... wurrwiiyu... wiptowii... prrriiii"; in Tanzania similar but more burry, often with upslurred "wurrriii", and sometimes introduced with shorter, faster "yerr-terwii"; in Mozambique, described as variation on a loud, slightly quavering 2-note "wheee-whirr", and often repeated by separated pair-members. Usually given in twilight. Call a far-carrying "wuuiiuuu" or "whiiu" for contact, also used to begin song; in alarm a loud rattling "shriiiiiiih"; in aggression a whistled "siiiiih" with fragments of subsong, e.g. "siiii-herrr-riiiiih-wheroe".

Habitat. Tall, mainly montane forest with open understorey, at 1600–2400 m in Malawi, 1800–2100 m in Zambia (Nyika Plateau), c. 1125 m in Mozambique (Mt Gorongosa); in Tanzania to 2600 m, sometimes breeding as low as 500 m and venturing down to 250 m in cold season. Breeds also in lowland forest in Mozambique. Has been suggested that presence of active army-ant colony is required in breeding territory, but not seen in a territory in Mozambique.

Food and Feeding. Invertebrates, mainly insects such as beetles, moths, termites, *Dorylus* army ants, also other ants and their larvae; also earthworms, snails, spiders, millipedes; small amphibians and a few small berries also taken. Forages largely on ground, hopping and running to catch prey or making short aerial sally; also gleans from leaves, trunks and branches, normally below 2 m. Regularly attends ant swarms, waiting just ahead of column; also joins mixed-species flocks.

Breeding. Oct–Jan in Malawi, Oct–Mar in Tanzania and Nov in Zambia and Mozambique. Territory in small forest patches 0·5–4 ha, mean territory size of four pairs in lowland Mozambique was 1·6 ha. Nest a thick cup of green moss lined with fine rootlets, sometimes incorporating dead leaves and *Usnea* lichen, placed 1–8 m up in fork, vine tangle or stump top. Eggs 2 (only Mozambique record was of 3), pale to olive-green with brown to dark green spots or dense blotches; no information on incubation and nestling periods; post-fledging dependence at least 6 weeks, probably longer than 8 weeks. Successful breeding normally depends on presence of active army-ant colony; rarely breeds in successive years, since army-ant presence undependable. Average annual mortality rate 13·2% for males, 13·3% for females.

Movements. Mainly sedentary; for 39 ringed individuals in Malawi, maximum distance moved was only 480 m. Some downward altitudinal migration in non-breeding season (Jul–Aug) at least in Tanzania, and suggested for Mozambique, although in both areas species also present at low altitudes during warm/wet season. Recorded in riparian forest at 1370 m in N Malawi (Misuku Hills) in Aug.

Status and Conservation. Not globally threatened. Generally common. Density in continuous forest 20 pairs/km² in Malawi. In Tanzania, common in Ulugurus, uncommon in Nguus; 30 pairs (or 90 individuals)/km² in Udzungwa Mts; common in W Usambaras; uncommon in E Usambaras, where found in one study to be absent from most smaller forest fragments, suggesting some sensitivity to fragmentation. In lowland C Mozambique, habitat is presently being destroyed by logging and charcoal-burning.

Bibliography. Benson & Benson (1977), Beresford (2003), Burgess & Mlingwa (2000), Carter (1978), Chittenden (1999), Clancey (1985, 1996), Clancey & Lawson (1969), Dowsett (1985b), Dowsett & Dowsett-Lemaire (1984), Dowsett-Lemaire (1987, 1989), Jensen *et al.* (1985), Johnston-Stewart (1982), Jones (1999), Keith *et al.* (1992), Moyer (1993), Newmark (1991), Seddon *et al.* (1999a, 1999b), Sinclair (1984), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Stuart & Hutton (1977), Stuart & Jensen (1985), Svendsen & Hansen (1995), Willis (1985), Zimmerman *et al.* (1996).

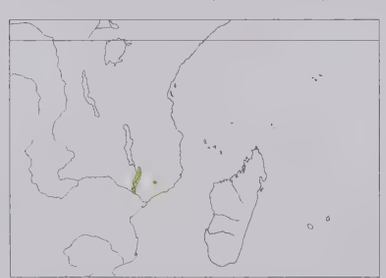
157. **Thyolo Alethe**

Pseudalethe choloensis

French: Alèthe du Cholo **German**: Choloalethe **Spanish**: Alete de Cholo
Other common names: Cholo (Mountain) Alethe

Taxonomy. *Alethe choloensis* W. L. Sclater, 1927, Thyolo (Cholo) Mountain, south Malawi.
Genus only recently split from *Alethe*. May form a superspecies with *P. poliocephala*, *P. poliophrys* and *P. fuelleborni*. Two subspecies recognized.

Subspecies and Distribution.
P. c. choloensis (W. L. Sclater, 1927) – S Malawi and adjacent Mozambique (Mt Chiperone).
P. c. namuli (Vincent, 1933) – Mt Namuli, in NC Mozambique.



Descriptive notes. 17–19 cm; 41 g. Nominate race resembles *P. fuelleborni*, but head plainer and browner, white chin and throat clearly demarcated from buff-washed grey mid-breast and brownish breast side, white belly and rich buff vent and undertail-coverts; tail dark brown with white outer tips. Sexes similar. Juvenile is like juvenile *P. fuelleborni*. Race *namuli* is paler below than nominate, with white vent. VOICE. Song a series of phrases of 3–4 notes lasting 2–2·5 seconds, "tyerr... wor-tyer-chii" (second note lowest) or "wor... tii-tyer-tyurr" (first note lowest, second highest, next two descending); softer, higher and more varied than that of *P. fuelleborni*. Calls included loud downslurred "piiiyuu" in contact, rattling nasal chitter, "triiit-triiit-triiit", in alarm resembling that of *P. fuelleborni*, and thin "siiii" in aggression.

Habitat. Mid-elevation evergreen forest, often near edges, in areas of dense undergrowth to fairly open understorey; also recorded in dense *Brachystegia* woodland adjacent to forest. Breeds at 1000–1700 m, but in Malawi as low as 720 m on Mt Mulanje, and reaching 1900 m in summer; in Mozambique, recorded at 1160–1850 m on Mt Namuli and 1530–1950 m on Mt Chiperone.

Food and Feeding. Only insects recorded, including army ants, beetles and larvae. Forages on ground amid leaf litter, and gleans prey from trunks and leaves in flight. When following army-ant swarms, runs to snap up disturbed animals or drops on to them from low perch; 4–5 individuals may feed at a single swarm.

Breeding. Sept, Nov and Jan in Malawi; Sept, and juvenile in Dec, in Mozambique. Only nest found was a cup of green moss lined with dry tendrils, 4 m up in fork of tree. Eggs 3, green with dull chestnut, lilac and pale grey mottling. No other information.

Movements. Mainly sedentary; some altitudinal movement in Malawi, where suggested to descend to 700 m on Mt Mulanje in Mar–Sept.

Status and Conservation. ENDANGERED. Restricted-range species: present in Tanzania-Malawi Mountains EBA. Global population placed at 2500–5000 mature individuals, and considered declining. Known from 15 small forest patches, 13 in SE Malawi and only two (Mt Chiperone and Mt Namuli) in adjacent Mozambique. Density related to presence of army-ant nests, and can persist in forest patch as small as 0·5 ha so long as ant nest present. In Malawi, Mt Mulanje estimated to hold 1000 pairs and Mt Thyolo 200 pairs in 1983, but study in 1998, based on much higher density values (c. 8 birds/ha), again yielded 1000 pairs for Mulanje; so, population on Mulanje may have declined with habitat loss, as it certainly has on Thyolo. Between early 1970s and early 1990s at least three known localities were destroyed, including 40-km² Chisongeli Forest (on Mulanje); in 1995–1996 much of habitat at Lisau (Mt Chiradzulu) and on Zomba was burnt. In Mozambique, density on Namuli tentatively estimated at 8·6 birds/ha; Namuli is being selectively logged and a road built nearly to the summit, while encroachment is predicted soon for Chiperone. Malawi requires a major land-reform and water-conservation initiative to spare its biodiversity-rich forest patches from complete erasure. Namuli is also of great biological importance and needs protected-area status.

Bibliography. Benson & Benson (1947, 1950, 1977), Beresford (2003), Collar & Stuart (1985), Dowsett-Lemaire (1987, 1989), Dowsett-Lemaire & Dowsett (1988), Johnston-Stewart (1982, 1989), Keith *et al.* (1992), Ryan *et al.* (1999), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stead (1978), Vincent (1935b).

Genus *ALETHE* Cassin, 1859

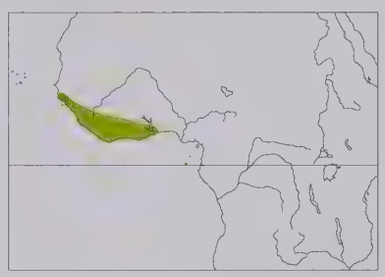
158. **White-tailed Alethe**

Alethe diademata

French: Alèthe à huppe rousse **German**: Diademalethe **Spanish**: Alete Diademado

Taxonomy. *Bessonornis* (*Turdus*) *diadematus* Bonaparte, 1850, Guinea.
Forms a superspecies with *A. castanea*; has been treated as conspecific, and very similar in both song and habits, but plumage differences (including of juveniles) suggest that the two are better treated as separate species. Monotypic.

Distribution. Senegal E to Togo.



Descriptive notes. 18 cm; 31–35 g. Very like *A. castanea*, but lacks rufous in plumage of back, wings and tail, being instead cinnamon-brown with olive-blackish wings and tail; broad white tips to outer three rectrices. Sexes similar. Juvenile is blackish with orange spots above, white tail tips, pale dull orange below, whitish throat and belly, blackish streaks and scaling on breast and upper belly. VOICE. Song a series of a standard phrase consisting of 3 (sometimes 4 in Sierra Leone) liquid whistles, each on higher pitch than preceding one, "hah-her-huii", second note slightly downslurred, third either upslurred or downslurred; alternatively a 4-note whistle, "hoo heen hoo heer". Subsong a conversational mix of whistles and rattles. Call a single low whistle constantly repeated every 2·5–3 seconds; a low nasal "taaaa" recalling bush-shrike (*Laniarius*), in mild alarm or warning; clicking chatter in alarm; grunting "chahh" and 4–10 chipping notes in aggression, and whimpering "iih-iih-iih-iih" from supplanted bird.

Habitat. Primary forest, old secondary and regenerating forest, gallery forest, forest patches in savanna, plantations. Lowlands to 1500 m in Liberia.

Food and Feeding. Mainly insects, such as grasshoppers, crickets, cockroaches, beetles, caterpillars, termites, black ants, army ants, moths and flies; also spiders, small snails and small frogs. Forages on ground and in low vegetation, tossing aside leaves, gleaning prey from leaves, tangles, logs, branches, trunks and lianas. Habitually attends swarms of *Dorylus* army ants, keeping ahead of column or perching above it; pursues flushed prey in run or in aerial sally, or drops on to prey from perch. Also joins mixed bird flocks in dry season (when ants inactive).

Breeding. Breeding condition Jun–Sept (juveniles Aug–Nov) in Liberia; fledged young Jan and adult carrying food Nov in Ivory Coast; sometimes double-brooded. Territory size 5–6 ha. Nest a compact or loose shallow cup made of rootlets, bark, twigs, moss, leaves and mud, lined with small black rootlets, *Marasmius* fungus strands and leaves, placed on ground under log or up to 3·3 m above ground in cavity in tree trunk, dead stump, rotting log or termite mound. Eggs 2–3, mostly 2, green, beige, pinkish-ochre or pinkish-white, with brown, chestnut, maroon and lilac blotching; no information on incubation period; nestling period 12–13 days.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Locally common.

Bibliography. Ash (1990), Bannerman (1953), Beresford (2003), Borrow & Demey (2001), Brosset & Érard (1986), Colston & Curry-Lindahl (1986), Demey & Fishpool (1994), Demey & Rainey (2004), Farmer (1979), Gartshore *et al.* (1995), Gatter (1997), Keith *et al.* (1992), Maisels (2003), Naidoo (2004), Sinclair & Ryan (2003), Thiollay (1985), Willis (1986).

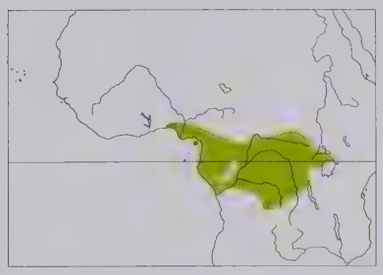
159. **Fire-crested Alethe**

Alethe castanea

French: Alèthe à couronne orangée **German**: Kastanienalethe **Spanish**: Alete Castaño
Other common names: Firecrest Alethe

Taxonomy. *Napothera castanea* Cassin, 1856, Moonda River, western Africa.
Forms a superspecies with *A. diadematа*; has been treated as conspecific, and very similar in both song and habits, but plumage differences (including of juveniles) suggest that the two are better treated as separate species. Two subspecies recognized.

Subspecies and Distribution.
A. c. castanea (Cassin, 1856) – Nigeria E to W DRCongo, S to N Angola; also Bioko I (Fernando Póo).
A. c. woosnami Ogilvie-Grant, 1906 – N & C DRCongo E to SW Sudan and Uganda.



Descriptive notes. 18–20 cm; 27–40 g. Nominate race has chestnut forehead, pale orange centre of crown (erectile and tipped brown, so can be partly concealed), face ash-grey; upperparts dull chestnut, wings blackish-brown with dull chestnut fringes, tail blackish-brown with chestnut-tinged outer webs; chin to belly white, breast side and flanks grey; bill black; legs bluish-grey. Sexes similar. Juvenile is blackish, spotted orange, above, pale dull orange below, with blackish streaking and scaling on breast and upper belly. Race *woosnami* is grey-brown on forehead, with slightly less bright upperparts (only secondaries edged chestnut) than nominate. Voice. Song very like that of *A. diademata*, but with only 2 notes, "ho-fiir", the second higher than first and downslurred; also a series of pure "huu huu huu" notes, given 16–23 times in a minute. Musical subsong, "herdy *hear* wer turder" or "*hear* her do", also given during aggressive chases. Call a drawling "kkssss"; single, clear "heer" whistle when leaving ant nests in evening; grunting "chaff" when disturbed, also during frequent aggressive interactions at ant columns, when sudden "chip chip chip" (4–10 notes) and other sounds also given; supplanted bird may give whimpering "eeh eeh eeh" (accompanied by downward wing-fluttering).
Habitat. Ground and undergrowth of primary and old secondary forest, gallery forest, forest patches in savanna. Occurs at 700–1500 m in Uganda, 50–1500 m in Cameroon, sea-level to 1200 m on Bioko, and to 1500 m in DRCongo.
Food and Feeding. Termites, flies, cockroaches, grasshoppers, caterpillars, beetles, crickets, spiders, small frogs, and a few driver ants. Larger prey mandibulated and battered on ground. Often feeds on ground, hopping short distances; also, often sallies from low (less than 1 m up) horizontal perch, less commonly from higher perch (up to 20 m). Usually catches ground prey by sallying or with hopping rush, but also pecks at ground, tosses leaves, and occasionally sallies to trunks, lianas, debris, limbs, foliage, or in air; sallies usually short, but may be up to 10 m. More closely linked to ant swarms than are other alethes; commonly, up to 50 individuals aggregate at columns of the army ant *Dorylus wilverthi*. Usually ranges just ahead of or high above swarm, sallying back for flushed prey; may sally to middle of column to catch flushed items, fluttering, jumping or hovering to escape ants, and sometimes needing to fluff and peck ants from plumage afterwards. Frequently involved in aggressive encounters with other ant-following birds, especially conspecifics. May also be found in mixed-species flocks away from ants. Has been seen to glean ectoparasites from a sitatunga (*Tragelaphus spekeii*).
Breeding. May, Aug and Oct (juveniles Nov) in Cameroon (moult and brood-patch data suggest most breeding Apr–Nov); Dec–Mar (especially Dec–Jan) in Gabon, but juveniles Jan–Aug, suggesting longer season; breeding condition Apr and juveniles Jan, May and Nov in DRCongo, where suggested as breeding Apr–Dec N of equator and Sept–Mar S of it; Mar in E Africa; breeding condition Feb in Angola; one record of double-brooding. Territory size c. 5–6 ha. Nest a cup of variable neatness, made of bark, rootlets, dead leaves and moss, lined with rootlets and *Marasmius* fungus, placed against tree buttress, on top of stump or *Procubitermes* termitarium, once inside old metal container, but especially inside large, open tree cavity or dead rotting tree, 0·8–3·3 m above ground. Eggs 2–3, greenish or salmon-ochre with strong violet-grey and brown spotting; no information on incubation period; nestling period 12–13 days. One nest preyed on by mandrills (*Mandrillus*).
Movements. Sedentary.
Status and Conservation. Not globally threatened. Density 13–16 pairs/km² in Gabon. Common on Bioko (commoner below 800 m than above). Fairly common in tiny range in S Sudan. Very common in Itombwe Mts, in E DRCongo.
Bibliography. Bannerman (1953), Beresford (2003), Borrow & Demey (2001), Britton (1980), Brosset (1969), Brosset & Érard (1986), Chapin (1953), Christy & Clarke (1994), Dean (2000), Eisentraut (1973), Keith *et al.* (1992), Lippens & Wille (1976), Maisels (2003), Nikolaus (1987), Pérez del Val (1996), Plumptre & Mutungire (1996), Prigogine (1971), Rodewald *et al.* (1994), Sinclair & Ryan (2003), Stuart (1986), Willis (1986).

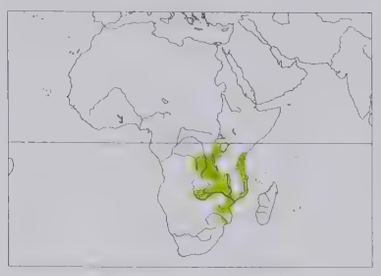
Genus *CICHLADUSA* W. K. H. Peters, 1863

160. **Collared Palm-thrush**

Cichladusa arquata

French: Cichladuse à collier **German**: Morgenrötel **Spanish**: Zorzal-palmero Acollarado
Other common names: Scrub Palm-thrush, Morning Thrush, Morning Warbler

Taxonomy. *Cichladusa arquata* W. K. H. Peters, 1863, Sena, near the Zambezi River, Mozambique. Monotypic.
Distribution. SE DRCongo, S Uganda and coastal Kenya S to N Botswana, W, N & E Zimbabwe and S Mozambique.
Descriptive notes. 17–18 cm; 28–38 g. Has light creamy to grey eye set in pale grey face, grey extending to neck side and breast; dull rufous cap, greyish-rufous back, rufous wings, bright rufous rump and tail; blackish malar stripe extending down to breast side and across much of breast; creamy-buff chin to upper breast, tawny-buff belly and flanks; bill black; legs slate-grey. Sexes similar. Juvenile lacks adult breast pattern, is streaked dark on crown to nape and on breast and flanks. Voice. Song, often from high perch in palm, a melodious, twice-repeated phrase, "de dee doodle-oo deedee", interspersed with scratchy, chucking and guttural notes and some mimicry of other birds, making pleasant medley. Call a repeated clear liquid note, "weet-weet"; in alarm a sharp chattering, and harsh "churr churr" or shrill "priiii"; mimics calls of other species; in flight, often clatters wings to produce loud "prrrup prrrup".
Habitat. Thickets of ivory palm (*Hyphaene ventricosa*) along rivers, and bush clumps in ivory palm and borassus palm (*Borassus aethiopicum*) savanna; also around *Phoenix* and alien coconut palms, and in thickets and gardens some distance from usual palm habitats, including in *Combretum* and mopane woodland. Often found around human habitation, where may also roost, perhaps mainly during drought. Recorded up to 1400 m.



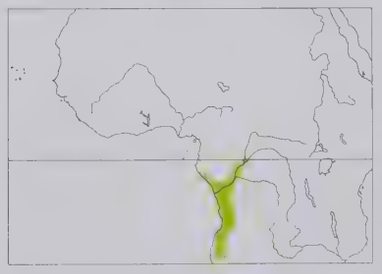
Food and Feeding. Invertebrates and small frogs. One stomach held 93 insects of 11 species: 38% of items were southern green stink bugs (*Nezara viridula*), 25% brown earwigs (*Forficula*), 17 % cockroaches (Blattidae), and 6% scarabeid beetles (of genus *Heteronychus*), as well as plant bugs (Lygaeidae), water bugs (Notonectidae), water boatmen (Corixidae), various other beetles (families Melolonthidae, Scarabeidae, Elateridae) and grasshoppers (Acrididae). Nestlings fed with centipedes, bush-crickets, elaterid larvae, caterpillars, moths and small frogs. Forages on ground, often in pairs or small groups, mainly in understorey but also in open; also, sometimes drops on to prey from perch.
Breeding. Dec–May in DRCongo, Nov–Apr in Malawi, May in Tanzania, Oct–Nov and Feb–Mar in Zambia and Oct–Jan in Zimbabwe. Nest a truncated cone (broader at base than at cup) of grass, shreds of palm fibre, petioles and tendrils, bound and plastered to frond with mud, placed 15–20 m above ground against hanging palm leaf, near base of frond or in cavity where frond broken, and usually well concealed; also in leaf mass of dragon tree (*Dracaena*), or on eaves or rafters of building or other man-made structure, on which it may be plastered directly to wall, forming half-cone; nest often reused. Eggs 2–3, pale greenish-white with faint reddish speckles and spots and larger pale purplish and lilac stains; incubation period 13 days; nestling period 20 days. Only one nest monitored; successfully fledged three young.
Movements. Apparently sedentary; during drought conditions has been recorded in atypical habitat (suburbia, alien vegetation) in E Zimbabwe.
Status and Conservation. Not globally threatened. Rather local, confined to a special habitat; often common within areas of such habitat, and in some E African towns. Fairly common on Kenya coast S of Gazi. Sometimes inexplicably absent from apparently suitable habitat.
Bibliography. Ash & Miskell (1998), Benson (1944), Benson & Benson (1947, 1977), Benson & Pitman (1963), Benson *et al.* (1971), Brelsford (1943), Britton (1980), Chapin (1953), Donnelly (1967), Fuggles-Couchman (1939, 1986), Hanmer (1989b, 1993), Hanmer & Chadder (1993), Hustler (1985), Irwin (1981, 1983a), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Maclean (1993), Osborne (1983), Parker (1999), Roche (2003), Saunders (1981), Sinclair (1984), Sinclair & Ryan (2003), Steyn (1996), Swynnerton (1908), Tarboton (2001), Townley (1936), Vincent (1935b), Wilson (1964), Zimmerman *et al.* (1996).

161. **Rufous-tailed Palm-thrush**

Cichladusa ruficauda

French: Cichladuse à queue rousse **German**: Graubrusttrötel **Spanish**: Zorzal-palmero Colirrufo
Other common names: Red-tailed Palm-thrush

Taxonomy. *Bradyornis ruficauda* Hartlaub, 1857, Gabon.
Monotypic.
Distribution. S Gabon and lower R Congo S to W Angola and extreme NW Namibia (along S bank of R Cunene).



Descriptive notes. 18 cm; 28–30 g. Dull rufous cap, dusky-rufous back and wings, bright rufous rump and tail; pale grey face and sides; creamy-buff chin to centre of breast and upper belly, tawny-buff lower belly; eye reddish-brown, bill black; legs slate-grey. Very like *C. arquata*, but has smaller area of creamy-buff on throat, lacks black border of throat and breast, different eye colour. Sexes similar. Juvenile is like adult, but streaked and spotted dusky above and on grey breast. Voice. Song is loud and clear, and similar to that of *C. arquata*, interspersed with churring and rich babbling notes, and sometimes with mimicry of calls of other species; often in duet, and frequently given in evenings. Calls include harsh "chrrr" in alarm.
Habitat. Thickets and savannas of ivory palm (*Hyphaene ventricosa*), groves of oil palm (*Elaeis guineensis*), plantations, bush clumps in dry lowland baobab–acacia (*Adansonia–Acacia*) woodland, thickets in (gallery) forest, secondary forest; sometimes around houses and gardens, e.g. in W DRCongo (Kinshasa). Roosts in palms. To 1200 m in Angola.
Food and Feeding. Invertebrates, including spiders and (adult and larval) beetles, and small fruits and berries, including occasionally oil palm fruits. Forages on ground and in low bushes, and often among animal droppings.
Breeding. Sept–Oct, Dec–Jan and Mar–May in Angola, Oct–Apr in DRCongo and Mar in Namibia. Nest a thick-walled, truncated cone of mud incorporating grass and pieces of plant material, cup lined with grass, etc., placed at base of palm frond, against drooping frond, in cleft in main trunk of baobab or other large tree, or on rock ledge or building (then attached directly to vertical surface, forming half-cone). Eggs 2–4, pale greenish-white with pink or dull rufous speckles. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Locally common; common throughout escarpment zone in Angola.
Bibliography. Bannerman (1953), Borrow & Demey (2001), Brown (1993), Chapin (1953), Clancey (1985), Dean (1976, 2000), Harrison *et al.* (1997), Keith *et al.* (1992), Lippens & Wille (1976), Serle (1955), Sinclair (1984), Sinclair & Ryan (2003), Tarboton (2001), Vernon (1973).

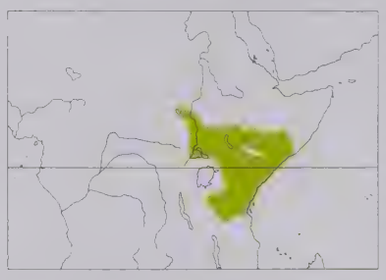
162. **Spotted Palm-thrush**

Cichladusa guttata

French: Cichladuse tachetée **German**: Tropfenrötel **Spanish**: Zorzal-palmero Moteado
Other common names: Spotted Morning Thrush, Spotted Morning Warbler

Taxonomy. *Crateropus guttatus* Heuglin, 1862, Bahr el Abiad (= White Nile), south Sudan–Uganda border.

Three subspecies recognized.
Subspecies and Distribution.
C. g. guttata (Heuglin, 1862) – S Sudan, NE DRCongo, Uganda and NW Kenya.
C. g. intercalans Clancey, 1986 – SW Ethiopia S to C Kenya and C Tanzania.
C. g. rufipennis Sharpe, 1901 – S Somalia, E Kenya and NE Tanzania.



Descriptive notes. 16–17 cm; 17–30 g. Nominate race is warm brown from crown to back and wings, becoming rufous on rump and rufous-brown on tail; whitish supercilium, dusky-brown eyestripe; mostly creamy face and chin to throat, with black-spotted malar linking to black-arrowed creamy-white underparts, stained buff-rufous on flanks and vent; bill black; legs slate-grey. Sexes similar. Juvenile has breast whitish, spotting browner and vaguer. Race *intercalans* is more rufous on wings, buffier below, more heavily spotted below; *rufipennis* is smaller than previous, less buff and with smaller spots below. Voice. Song (sometimes also on moonlit nights, or before dawn) a loud clear series of powerful variable whistled phrases, typically involving 3 slurred melodious notes, "tiiyit, tuuyu, ruuiyo", but with many warbling and churring notes intermixed, also mimicry of other birds, and often introduced by chuckling sound. Calls include low "pii-u-priri-piiiu" for contact, and scolding "chaaaa" or "skurrr" in alarm; may give prolonged, near-perfect imitations of other species, e.g. Greater Honeyguide (*Indicator indicator*), as independent calls.
Habitat. Less tied to palms than are congeners; occupies thick riparian, lakeside and coastal scrub and thickets, bush clumps in dry savanna, evergreen scrub in juniper woodland, rarely above 1500 m, except in S Ethiopia; also gardens in towns and villages.
Food and Feeding. Invertebrates, including small snails; also *Cordia* fruits. Young fed with bush-cricket nymphs, beetle larvae, Lampyrinae larvae, moth caterpillars. Forages on ground in cover or in open, singly or in pairs; much wing-flicking and tail-cocking. Generally very retiring, but becomes confiding around game-park lodges and in gardens.
Breeding. Most months in E Africa, depending on region; Sept in Sudan and DRCongo; Nov–Dec and Apr–May in Somalia. Nest of mud bound with grass or leaves, thinly lined with grass, bark fibre, rootlets and other material, placed usually 2–3 m up on thick branch of tree; one nest took c. 10 days to build; nest may be reused in same season. Eggs usually 2 (one clutch of 3), unmarked blue or turquoise-blue, sometimes paler at tip; incubation period 12 days. No other information.
Movements. Apparently sedentary.
Status and Conservation. Not globally threatened. Common throughout range, especially along dry watercourses. Recorded from Meru, Samburu and Tsavo National Parks, Kora Nature Reserve and Shaba Game Reserve, in Kenya; present in Lake Manyara and Tarangire National Parks and Mkomazi Game Reserve, in Tanzania.
Bibliography. Benson (1946a, 1946b), Britton (1980), Butler (1908), Chapin (1953), Keith *et al.* (1992), Lewis & Pomeroy (1989), Nikolaus (1987), North (1958), Oberholser (1905), Pitman (1930), Safford *et al.* (1993), Sclater & Mackworth-Praed (1918), Sinclair & Ryan (2003), van Someren (1956), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

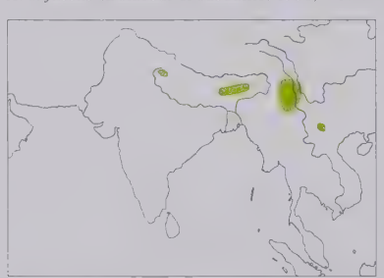
Genus *HETEROXENICUS* Sharpe, 1902

163. **Gould's Shortwing**

Heteroxenicus stellatus

French: Brachyptère étoilée **German**: Braunrücken-Kurzflügel **Spanish**: Alicorto Estrellado
Other common names: Chestnut Shortwing

Taxonomy. *Brachypteryx* (*Drymochares*) *stellatus* Gould, 1868, Nepal.
Commonly placed in genus *Brachypteryx*, but herein considered sufficiently distinctive in plumage and vocalizations to warrant reinstatement in its own monotypic genus. Two subspecies recognized.
Subspecies and Distribution.
H. s. stellatus (Gould, 1868) – C & E Himalayas E to NE Myanmar and S China (SE Xizang, Yunnan).
H. s. fuscus (Delacour & Jabouille, 1930) – NW Vietnam.



Descriptive notes. 12–13 cm; 19–23 g. Small and dark, with long legs, narrow tail. Nominate race is chestnut above, slaty below (very fine grey-and-black scaling), with black face, small white arrows or stars on belly, flanks and rump; bill blackish; legs brown. Sexes similar. Juvenile is duller, with buffy-streaked rufous-tinged breast, rufous-tinged belly. Race *fuscus* is darker than nominate, slightly weaker chestnut above. Voice. Song a series of phrases consisting of very high-pitched notes, gradually increasing in volume and speed to become undulating chittering, "tssiu, tssiu, tssiu, tssiu-tssiu-tsitsitssiutssiutssiu-tsitsitssiutssiutssiu". Alarm call "tik-tik".
Habitat. Breeds above tree-line in screes often far from bushes, at 3300–4200 m in Himalayas (2100–4200 m in China); winters in wooded valleys, boulder-strewn gullies and dank ravines with dense dwarf rhododendron, bamboo, fir and juniper, and with moss and fern undergrowth, down to 1800 m or lower; 1500 m in Vietnam.
Food and Feeding. Insects and seeds. Largely terrestrial.
Breeding. Reported May–Jul, with no details. No other information.
Movements. Subject to vertical movements, descending to lower elevations in winter.
Status and Conservation. Not globally threatened. Scarce and local; rare in China; possibly under-recorded. Habitat relatively secure, so species unlikely to be in decline.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Grimmett *et al.* (1998), Inskipp & Inskipp (1991, 1993), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Vaurie (1972).

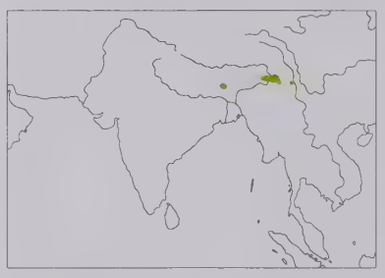
Genus *BRACHYPTERYX* Horsfield, 1821

164. **Rusty-bellied Shortwing**

Brachypteryx hyperythra

French: Brachyptère à ventre roux **Spanish**: Alicorto Ventrirrufo
German: Rostbauch-Kurzflügel
Other common names: Rusty-breasted Shortwing

Taxonomy. *Brachypteryx hyperythra* Jerdon and Blyth, 1861, Darjeeling, India.
Monotypic.
Distribution. E Himalayas in West Bengal, Sikkim, Assam and Arunachal Pradesh, and adjacent extreme N Myanmar and S China (NW Yunnan).



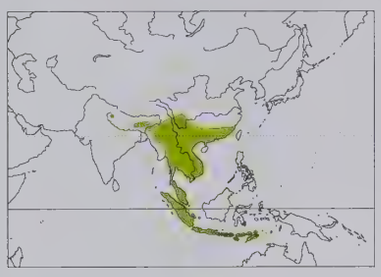
Descriptive notes. 12–13 cm. Male is dark slaty-blue above and on face, with black lores, short white brow, short wings and tail; rich orange-chestnut throat to vent; bill all black when breeding, otherwise pale-based; long legs pink. Female is slaty-brown above, with dark brown face to malar; throat pale rufous, browner on side of breast and flanks, centre of belly paler; bill extensively pale at base. Juvenile undescribed. Voice. Song an effortlessly delivered high-pitched accelerating slurred warble of very short tinkling notes, introduced by spaced notes and ending abruptly with quick flourish of upslurred notes or dry trills, "tu-tiu tuu diideluudeliilelo deliiswititit", faster, longer and more musical than that of *B. leucophris*. Calls include "chack", and "gueh" in response to song playback.
Habitat. Breeds in dense *Arundinaria* ("ringal") bamboo, undergrowth and thickets inside broadleaf evergreen forest, also in (and possibly greatly favouring) steep, damp and densely vegetated gulleys in secondary scrub, at 1800–3000 m. Winters in dense reeds, bamboo, grass jungle, thick secondary scrub, forest undergrowth and overgrown gulleys, at c. 450–2950 m.
Food and Feeding. Beetles found in stomachs. Forages in low vegetation and on ground.
Breeding. No information. Season presumably Apr–Jun, when singing at greatest intensity.
Movements. Probably a partial elevational migrant throughout range.
Status and Conservation. VULNERABLE. Restricted-range species: present in Eastern Himalayas EBA. Global population placed at 2500–10,000 mature individuals; considered declining, apparently in response to forest clearance and degradation probably mainly through logging, small-scale fuelwood collection, conversion to tea plantations, shifting agriculture and livestock grazing. In recent review, 19 localities mapped, of which only nine known to involve post-1980 records. Very rare in China, and generally considered very scarce and local, although possibly greatly overlooked; range may be found to extend to Nepal, Bhutan and SE Tibet. Fairly dense population discovered in Lava area of West Bengal in 1996, indicating that species can go undetected in relatively well-watched areas; concerted efforts to find this species in Bhutan, however, have failed, implying that it may be very local. Recorded only recently in N Myanmar. Observed in Namdapha National Park and Mehao, Dibang and Kamleng Wildlife Sanctuaries, in India. Range-wide surveys and detailed ecological study to determine year-round requirements needed, along with major initiative to work with local communities to conserve forest areas in which it occurs.
Bibliography. Ali (1977), Ali & Ripley (1987b), Athreya (1996), Cheng Tsohsin (1987), Choudhury (2000), Collar *et al.* (2001), Grimmett *et al.* (1998), Heath (1988), Inglis (1951–1969), Katti *et al.* (1992), MacKinnon & Phillipps (2000), Mauro & Vercruysse (2000), Meyer de Schauensee (1984), Peng Yanzhang *et al.* (1980), Rasmussen & Anderton (2005), Stattersfield & Capper (2000), Stevens (1914–1915, 1923–1925).

165. **Lesser Shortwing**

Brachypteryx leucophris

French: Petite Brachyptère **German**: Zwergkurzflügel **Spanish**: Alicorto Chico
Other common names: Brown Shortwing; Caroline's/Mrs La Touche's Shortwing (*carolinae*)

Taxonomy. *Myiothera leucophris* Temminck, 1828, Java.
Five subspecies recognized.
Subspecies and Distribution.
B. l. nipalensis F. Moore, 1854 – Himalayas, W & N Myanmar and S China (SW Sichuan, W Yunnan).
B. l. carolinae La Touche, 1898 – S & SE China, E Myanmar, NW Thailand and N Indochina.
B. l. langbianensis Delacour & Greenway, 1939 – S Indochina.
B. l. wrayi Ogilvie-Grant, 1906 – C & S Malay Peninsula.
B. l. leucophris (Temminck, 1828) – Sumatra, Java and Lesser Sundas.
Descriptive notes. 11–13 cm; 12·5 g. Male nominate race is olive rufous-brown above, often concealed short white eyebrow, very short wings and tail; whitish below, with brownish-buff breast and flanks; bill blackish, pale base; long legs pink. Female is similar to male, but has weaker white eyebrow, paler bill base. Juvenile is like adult, but spotted. Race *nipalensis* male is dull blue-grey above, whitish below, with pale dull blue-grey breast and flanks, female rufous-tinged olive-brown above, vague pale brown scaling on breast and flanks; *carolinae* both sexes very like female of previous, but slightly more rufous above; *langbianensis* like last, but male has supercilium grey at rear and extending farther towards forehead, grey breastband and flanks; *wrayi* darker, male with slaty-blue upperparts, face, breast and flanks, rest of underparts white, female like *carolinae*, but warmer above, with more chestnut-tinged wing and tail. Voice. Song, starting with a single note, then a split-second pause, is a short, loud, sweet high-pitched warble beginning with several short different-pitched sibilant notes, then becoming a jumbled flourish with buzzy, rich and musical notes, later ones typically alternating rapidly in pitch; like that of *B. montana* but without latter's



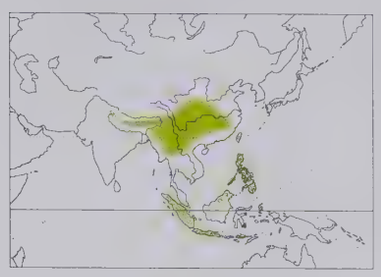
diminishing final phrase, and with richer tone and some longer notes but more mournful than that of *B. hyperythra*. Calls include high, sibilant, slightly downslurred short "psueeet", subdued hard "tack" and high mournful whistle; also (in Indonesia) a ringing "turrr turrr".
Habitat. Breeds in dense damp undergrowth in humid broadleaf forest and secondary growth, preferably near streams and in ravines, but also on hillsides and ridgetops, locally ascending into stunted forest; generally between 1500 m (more rarely from 700 m) and 2100 m, sometimes reaching 3900 m; in Greater Sundas 900–1900 m; in Lesser Sundas 600–2100 m. Usually nests in dwarf bamboo in Vietnam. Winters in scrubbier, grassier habitat, as low as 250 m.
Food and Feeding. Chiefly insects; in Indonesia snails, slugs, grubs and beetle pupae.
Breeding. Apr–Jul in Himalayas, Mar–Jun in Peninsular Malaysia and Oct–Apr in Java. Nest a compact dome with large side entrance, made of bamboo, leaves, roots and moss, lined with rootlets, leaf skeletons and dead palm leaves, placed within camouflaging vegetation such as orchid clump, dwarf bamboo or rattan, on or near ground, in low bush, or amid moss growing on rock or tree. Eggs 2–4 (1–2 reported Indonesia), olive-green to sea-green with light reddish-brown freckles. No information on incubation and nestling periods. Nests sometimes parasitized by Large Hawk-cuckoo (*Cuculus sparverioides*).
Movements. Resident; altitudinal movements in Himalayas, descending to foothills in winter. Recent records in Hong Kong suggest at least some local short-distance migration in winter.
Status and Conservation. Not globally threatened. Rare in W Himalayas, becoming commoner to E, and very common in NE India; fairly common in Myanmar. Rare in China. Locally common in Thailand; fairly uncommon in Peninsular Malaysia. Common, at least locally, in Sumatra, Java and Bali; generally uncommon and local in Wallacea, although fairly common in W Timor on Gunung Mutis.
Bibliography. Ali (1977), Ali & Ripley (1987b), Caldwell & Caldwell (1931), Carthy (2004), Cheng Tsohsin (1987), Coates & Bishop (1997), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Glenister (1971), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Medway & Wells (1976), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Wells & Medway (1976), White & Bruce (1986), Wildash (1968).

166. White-browed Shortwing

Brachypteryx montana

French: Brachyptère bleue **German**: Bergkurzflügel **Spanish**: Alicorto Azul
Other common names: Blue Shortwing, Indigo-blue Shortwing; Himalayan Blue Shortwing (*cruralis*)

Taxonomy. *Brachypteryx montana* Horsfield, 1821, Java.
Race *goodfellowi*, rather different from others in plumage and voice, conceivably represents a separate species; *floris* also very distinctive in plumage and may represent a further species, although its voice is unknown. A population on Mindanao (Philippines) has highly distinct song; may be an unnamed race or species, or possibly merely a vocally differentiated deme. Fourteen subspecies recognized.
Subspecies and Distribution.
B. m. cruralis (Blyth, 1843) – C & E Himalayas, Myanmar, S & SC China (S Sichuan S to SE Xizang and NW Yunnan), NW Thailand and N Indochina.
B. m. sinensis Rickett & La Touche, 1897 – SE China.
B. m. goodfellowi Ogilvie-Grant, 1912 – mountains of Taiwan.
B. m. poliogyna Ogilvie-Grant, 1895 – N Philippines (N Luzon).
B. m. andersoni Rand & Rabor, 1967 – S Luzon.
B. m. mindorensis Hartert, 1916 – Mindoro.
B. m. sillimani Ripley & Rabor, 1962 – Mt Mantalingajan and Mt Victoria, on Palawan (W Philippines).
B. m. brunneiceps Ogilvie-Grant, 1896 – Negros and Panay.
B. m. malindangensis Mearns, 1909 – Mt Malindang, on Mindanao.
B. m. mindanensis Mearns, 1905 – Mt Apo, on Mindanao.
B. m. saturata Salvadori, 1879 – Sumatra.
B. m. erythrogyna Sharpe, 1888 – N Borneo.
B. m. montana Horsfield, 1821 – Java.
B. m. floris Hartert, 1897 – Flores (Lesser Sundas).
Descriptive notes. 12–13 cm; 11–18 g (*mindorensis*), 27·5 g. Male nominate race is dull dark greyish-blue with relatively short concealable white supercilium, paler greyish on central underparts; bill and legs blackish. Female is similar, but with smaller white eyebrow and with rufous back, wings and tail. Juvenile is dark brown, with indistinct buff stippling on head, long whitish



streaks below; immature as adult, but mottled brown, with varying amount of dull chestnut on wings, rump and vent. Race *goodfellowi* male is olive-brown above, slightly rustier on forehead and rump, with long supercilium, paler below, whitish on mid-belly, bill black and much longer than in other races, legs brown, female similar but with slightly weaker supercilium; *cruralis* male is like nominate, but darker (same shade as upperparts) from chin to breast, then shading greyer, with longer supercilium, female dark russet-tinged olive-brown above with chestnut eyering, lores and chin, no supercilium, rufescent wings and tail, and paler and greyer brown from belly to vent; *sinensis* is similar to previous, but male dull pale blue-grey from chin to breast, shading to whitish on vent, with narrow white edge of carpals, female with more rufescent wings, no chestnut on face; *poliogyna* also similar, but female with dull olive-brown head to mantle and rusty-brown cheek to chin, shading to buffy-brown on throat, rather greyer rest of underparts; *andersoni* similar to last, but female darker, especially on crown, belly and undertail-coverts; *mindorensis* is also similar, but male slightly darker; *brunneiceps* small, male has blackish-blue head, female dark underparts; *malindangensis* is very like previous, but larger, with reduced white supercilium; *mindanensis* similar to last but has brighter upperparts and more prominent white supercilium; *sillimani* male has dark grey-blue head, female rusty throat and grey-washed pale blue underparts; *erythrogyna* male resembles nominate, female like male on mantle and scapulars, with olive-brown crown, rufous-chestnut face and underparts and blackish-chestnut tail; *saturata* is like nominate in both sexes, but breast darker; *floris* male is like nominate but paler blue above, reddish-brown wings, face dark ashy-brown, underparts ashy with whitish throat and mid-abdomen, darker grey flanks, female olive-brown on crown becoming rufous-brown from mantle to back and foxy chestnut on lower back, rump and outer tail (plainer brown wings and central rectrices), white below, buff-brown cheeks, greyish breast and grey-based buff-brown flanks. Voice. Song a usually short, jittery, silvery, almost formless warble, starting with indrawn thin vibrato whistles, "wheez", then some short dry trills and harsh notes with vibrato whistles throughout, as e.g. "hey did-dle did-dle the cat an" (abrupt finish); in Borneo, described as a series of loud fluty eerie whistles up and down scale, interspersed with harsh notes; in Java, starts slowly with several single notes, quickens to plaintive babble and stops abruptly; on Flores, a loud rich explosive jangle of clear, quick, rising and falling whistles with some scratchy notes, starting and ending abruptly, and individually variable. Call a hard "tack", and in alarm "tt-tt-tt" with wing-flicks.
Habitat. Dense undergrowth, brushwood, thickets, bamboo and bracken tracts in damp shady and mossy oak, fir and rhododendron forest, preferably around treefalls or near streams or in ravines, gulleys and crevasses, in Himalayas at 1500–3600 m (mainly above 2000 m), descending to 300–2400 m in winter; in Thailand above 1400 m, commonest above 2000 m. In N Philippines, race *poliogyna* favours dense jungle of climbing bamboo but found also in selectively logged, primary montane and mossy forest, 600–2000 m. At 900–2100 m in N Borneo (*erythrogyna*). In Java (nominate), comes out into open clearings and even bare rocky slopes on mountain tops. On Flores (*floris*), found in montane forest, scrubby regrowth and edges, and *Eupatorium* scrub; 610–1900 m, mainly above 1200 m.
Food and Feeding. Chiefly small insects, notably beetles, caterpillars, chrysales, grubs and larvae; also snails, worms. Forages on and just off ground on logs and in lowest branches. On ground moves very rapidly, like a rodent, making short runs from shelter of rock or leaf tangle to snatch prey item, and returning to cover.
Breeding. May–Jul in Himalayas; in Philippines, breeding-condition birds May on Mindoro, and other evidence of breeding in country Feb–Aug; Feb in Borneo and Oct–Apr in Java. Nest a relatively large but well-concealed dome of moss, bamboo leaves, grasses, epiphyte roots and ferns, lined with rootlets and fine fibres, with circular side entrance, attached to creepers just above ground in small bush or tree, sometimes in end of fallen rotten trunk. Eggs 3–4 (2 reported in Java, 2–3 in Philippines), fairly glossy white. No information on incubation and nestling periods. Brood-parasitized by Asian Lesser Cuckoo (*Cuculus poliocephalus*).
Movements. Resident; vertical movements in Himalayas, descending lower in winter.
Status and Conservation. Not globally threatened. Scarce in Himalayas in Himachal and Nepal, commoner E from Bhutan. Fairly common in Myanmar; uncommon to locally common in Thailand; locally common in Indochina. Generally common to very common throughout Philippines; fairly common in upland forest on Mindoro; population on Mindanao with appearance of this species, but distinctive voice, requires taxonomic investigation, but appears to be fairly secure. Locally common in Greater Sundas. Race *floris* known from type series collected in 1890s and from a few records in past 40 years, but judged uncommon to locally fairly common.
Bibliography. Ali (1977), Ali & Ripley (1987b), van Balen (1997), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Coates & Bishop (1997), Danielsen *et al.* (1994), Deignan (1945), Delacour & Jabouille (1931), Dickinson *et al.* (1991), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Kennedy *et al.* (2000), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Meyer de Schauensee (1984), Morris (1996), Rasmussen & Anderton (2005), Ripley & Rabor (1958), Robson (2000), Sheldon *et al.* (2001), Smythies (1986, 1999), Thewlis *et al.* (1998), Vaurie (1972), White & Bruce (1986).



PLATE 66

inches 4

cm 10

Genus *HEINRICHIA* Stresemann, 1931

167. **Great Shortwing**

Heinrichia calligyna

French: Brachyptère des Célèbes **German**: Celebeskurzflügel **Spanish**: Alicorto de Célebes
Other common names: Greater/Giant/Celebes Shortwing

Taxonomy. *Heinrichia calligyna* Stresemann, 1931, Latimodjong Mountains, Sulawesi.
Genus very close to *Brachypteryx*, but retained on basis of larger size and some colour characteristics. Races differ considerably in female plumage; *simplex* notably distinct from other two, suggesting possibility that it may merit full species status, but further evidence required; *picta* also suggested as perhaps meriting split. Possibly an additional, undescribed race exists in NC Sulawesi, and apparently reported from E Sulawesi; further study required. Three subspecies recognized.
Subspecies and Distribution.
H. c. simplex Stresemann, 1931 – N Sulawesi.
H. c. calligyna Stresemann, 1931 – SC Sulawesi.
H. c. picta Stresemann, 1932 – SE Sulawesi.



Descriptive notes. 17·5 cm. Male nominate race is dark blue, with black lores, some white at base of short tail, rusty-brown vent; deep red iris; bill blackish; legs grey. Female is dark blue above, with whitish preocular patch, chestnut-brown ear-coverts to throat and upper breast, rust-brown rump, slaty blue-grey belly shading to slaty-rufous vent. Juvenile is dark brownish-blue above, dark brown with vague paler streaking on throat, bluish-brown on breast, greyish-brown on belly, dark rufous-brown on lower belly to vent. Race *simplex* male has dark blue vent, female generally blackish olive-brown, rustier on chin and throat, more olive on breast, and with dark grey mid-belly; *picta* is larger-billed, male as previous, female like nominate but with smaller white preocular spot, chestnut of throat extending to breast and upper belly, where brighter. Voice. Song, which may be repeated without pause for up to 50 seconds, usually from mossy log or occasionally very low in bush, typically slow and strong, consisting of 3 notes, each long-drawn and falling (in one account upslurred, possibly a taxonomic difference), very melancholy; reported also as ending with single shrill high-pitched note, and sometimes to involve muted harsh notes from a second bird, presumably the female mate. Call a thin piping for contact; in alarm a rapid thrush-like chatter, "tetetetetetetete".
Habitat. Dense, impenetrable undergrowth of montane forest, notably rocky gulleys and overgrown streamsides in valleys with thick moss, 1500–3500 m.
Food and Feeding. Strictly terrestrial, with movements recalling *Erithacus rubecula*; forages in leaf litter, and around stones and clumps of moss and lichen.
Breeding. No information.
Movements. Evidently sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sulawesi EBA. Very little encountered and generally considered uncommon, but common to abundant at upper levels of elevational range. Present in Lore Lindu National Park.
Bibliography. Coates & Bishop (1997), Holmes & Phillipps (1996), Stresemann (1931), Stresemann & Heinrich (1940), Watling (1983a), White & Bruce (1986).

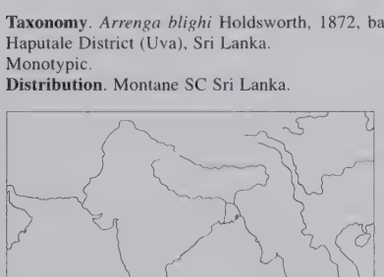
Genus *MYOPHONUS* Temminck, 1822

168. **Sri Lanka Whistling-thrush**

Myophonus blighi

French: Arrenga de Ceylan **German**: Ceylonpfeifdrossel **Spanish**: Arrenga de Ceilán
Other common names: Bligh's/Ceylon Whistling-thrush

Taxonomy. *Arrenga blighi* Holdsworth, 1872, banks of Lemastota oya, 4200 feet [c. 1280 m], Haputale District (Uva), Sri Lanka.
Monotypic.
Distribution. Montane SC Sri Lanka.



Descriptive notes. 19–21·5 cm. Male is velvety black, with bluish body sheen (in strong light), dull cobalt-blue (sometimes concealed) shoulder patch. Female is dull brown above, with dull purplish-blue shoulder patch, rufescent-brown on rump, uppertail-coverts and below. Juvenile is like female but rustier below, with narrow buff streaking on head and breast. Voice. Song an extraordinary exuberant continuous twittering of rich tinkling, chortling and high buzzy notes. Call a shrill whistled downslurred buzz, "sriii", given every few seconds and sometimes as double note, or preceded by shrill warbling series.
Habitat. Ground and lower storeys of dense, relatively undisturbed evergreen mountain forests, almost invariably close to rapidly running water (although may forage away from streams during daytime); particularly favours wooded and fern-grown ravines and gorges, keeping mostly within or beneath low overhanging streamside rocks and vegetation. From 900 m upwards, now mainly at 1200–2100 m.
Food and Feeding. Mainly insects, but also snails, small reptiles (including geckos and lizards such as *Ceratophora* or *Calotes*) and amphibians; bones of a tree-frog, probably *Polypedates*, found in stomach. Forages on ground, commonly at margins of water. Extremely shy and elusive; can sit immobile for long periods.
Breeding. Jan–May and Sept. Territory maintained by pair all year, although males noted as roosting communally where territories adjoin. Nest a large, compact structure of green moss and fern roots, lined with grass and rootlets, placed on rock ledge or tree fork next to rushing water, occasionally on stump. Eggs 1–2, pale greenish with sparse pale reddish-brown markings. No other information.
Movements. Presumably sedentary.
Status and Conservation. ENDANGERED. Restricted-range species: present in Sri Lanka EBA. Always considered scarce, and now thought to possess declining, increasingly fragmented population consisting of 1000–2500 mature individuals. In recent review, 26 localities mapped, of which only ten known to involve post-1980 records; available forest habitat, of which only areas near streams suitable, covers only 700 km². Threats include clearance of habitat, even some protected forests, through conversion to timber plantations and agriculture, compounded by die-back in some areas (perhaps owing to air pollution), and degradation of habitat through firewood collection, gem-mining and pesticide chemical run-off from vegetable farms, which pollutes streams within its range. Even tape playback by visiting birdwatchers may overly disturb breeding birds at Horton Plains National Park. Other protected areas with populations of this species include Peak Wilderness Sanctuary and Hakgala Strict Nature Reserve. Comprehensive survey and assessment of threats needed. Legally protected.
Bibliography. Ali & Ripley (1987b), Collar *et al.* (2001), Delacour (1924, 1942), Grimmett *et al.* (1998), Harrison (1999), Henry (1928, 1998b), Hoffmann (1997), Kotagama & Fernando (1994), Legge (1983), Lewis (1898), Phillips (1978), Rasmussen & Anderton (2005), Stattersfield & Capper (2000), Tunnard (1922b), Wait (1931), Warakagoda (1997), Whistler (1944).

169. **Shiny Whistling-thrush**

Myophonus melanurus

French: Arrenga de Sumatra **German**: Glanzpfeifdrossel **Spanish**: Arrenga Brillante

Taxonomy. *Arrenga melanurus* Salvadori, 1879, Mount Singalan, West Sumatra.
Monotypic.
Distribution. Mountains of Sumatra.



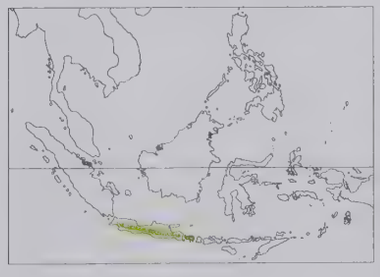
Descriptive notes. Male 24–29 cm, female 22–25 cm. Male is velvety jet-black with broad shiny deep blue spangles, plush black lores, deep blue forehead to superciliary area and nape, deep blue shoulder patch (often concealed); bill and legs black. Female is similar but blacker, with reduced body spangling. Juvenile is like female, with buffish shaft streaks on breast and flanks, fine buffish tips from forehead to above eye; crown side to nape, mantle, scapulars and shoulder patch metallic blue. Voice. Song apparently unreported. Calls include high-pitched screech.
Habitat. Ground and lower storeys of primary mossy hill forest and montane forest, including moss forest; usually near running water, but not so often as *M. castaneus*. At 500–3300 m.
Food and Feeding. Primarily vegetable matter, including some fruit and seeds; also insects and larvae. Forages mainly at middle levels of trees; also spends lengthy periods on or near ground.
Breeding. Sept; adults feeding young in May, and juvenile seen late Jan. Nest a large cup of moss and plant fibres placed against trunk or in fork of tree or along thick branch. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Common.
Bibliography. Andrew (1985), Chasen & Hoogerwerf (1941), Delacour (1942), MacKinnon & Phillipps (1993), van Marle & Voous (1988).

170. **Javan Whistling-thrush**

Myophonus glaucinus

French: Arrenga bleuet **German**: Javapfeifdrossel **Spanish**: Arrenga de Java
Other common names: Sunda Whistling-thrush (when treated as conspecific with *M. castaneus* and *M. borneensis*)

Taxonomy. *Pitta glaucina* Temminck, 1823, Java.



Forms a superspecies with *M. castaneus* and *M. borneensis*; all previously treated as conspecific. Monotypic.
Distribution. Java and Bali.
Descriptive notes. 24–26·5 cm. Male is bluish-black, with (often concealed but fairly extensive) bright blue shoulder patch; bill and legs black. Female is duller and browner, including shoulder patch. Juvenile is dark brown, with fine streak-shaped whitish spotting above and below, becoming heavier and broader on lower body. Voice. Song a series of loud clear whistles. Calls include trisyllabic squirrel-like screeching, pleasant whistling note and, in

On following pages: 171. Sumatran Whistling-thrush (*Myophonus castaneus*); 172. Bornean Whistling-thrush (*Myophonus borneensis*); 173. Malaysian Whistling-thrush (*Myophonus robinsoni*); 174. Malabar Whistling-thrush (*Myophonus horsfieldii*); 175. Taiwan Whistling-thrush (*Myophonus insularis*); 176. Blue Whistling-thrush (*Myophonus caeruleus*); 177. Grandala (*Grandala coelicolor*).

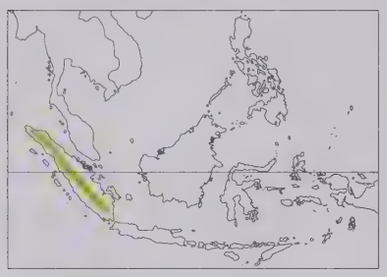
alarm, various loud, ringing, raucous sounds, e.g. "ooweet-oweet-tee-teet" followed by "truuu-truuu" or "cheet" or "tee-ee-eet... tee-ee-ee-eet".
Habitat. Ground and lower storeys of montane forest at 800–2400 m, locally lower on Bali; has a liking for dark caves and crevices as refuges, but not particularly tied to running water, and often on ridges.
Food and Feeding. Frogs, crickets, beetles, snails, slugs, woodlice, berries. Commonly terrestrial.
Breeding. Sept–May in W Java. Nest a large cup made of fern blades, moss and roots, placed in rock crevice, hole in riverbank or heart of bird-nest fern (*Asplenium nidis*). Eggs 2, pinkish with darker pink spotting. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Common within restricted range.
Bibliography. Collar (2004b), Delacour (1942), Hellebrekers & Hoogerwerf (1967), MacKinnon (1988), MacKinnon & Phillipps (1993), Strange (2001).

171. Sumatran Whistling-thrush

Myophonus castaneus

French: Arrenga à dos brun **German**: Sumatrapfeifdrossel **Spanish**: Arrenga Castaño
Other common names: Brown-winged/Chestnut-winged Whistling-thrush; Sunda Whistling-thrush (when treated as conspecific with *M. glaucinus* and *M. borneensis*)

Taxonomy. *Myiophoneus castaneus* R. G. W. Ramsay, 1880, Mount Sago, neighbourhood of Padang, West Sumatra. Forms a superspecies with *M. glaucinus* and *M. borneensis*; all previously treated as conspecific. Monotypic.
Distribution. Mountains of Sumatra.



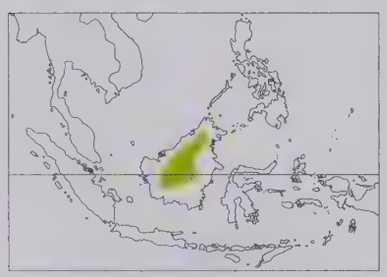
Descriptive notes. c. 25 cm. Male has metallic blue forehead-band, bluish-black upper body, shading on upper back, scapulars and belly to plain dull chestnut lower body, tail and wings; bright cinnamon-edged flight-feathers, blue shoulder patch (lesser wing-coverts); bill and legs blackish. Female is almost entirely dull plain chestnut, but head brownish-grey. Immature is like female, with bluish sheen on upper nape. Voice. Song undocumented. Call a grating "waaach".
Habitat. Subcanopy and middle storey of hill forest and mountain forest, mainly along watercourses, even dry ones on Gunung Kerinci; mainly 400–1500 m.
Food and Feeding. Forages commonly in middle and upper levels of trees, sometimes on rocks in streams, and fairly regularly in fruiting trees.
Breeding. Eggs and nestlings found in Feb; dependent juvenile in Dec. Nest placed on rock ledge along mountain stream. Eggs 2. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Scarce everywhere in range. Deforestation now extends deep into this species' elevational range, and its conservation status requires review. Possibly now Near-threatened or Vulnerable owing to limited range, limited numbers and diminishing habitat.
Bibliography. Collar *et al.* (2003), Delacour (1942), MacKinnon & Phillipps (1993), van Marle & Voous (1988).

172. Bornean Whistling-thrush

Myophonus borneensis

French: Arrenga de Bornéo **German**: Borneopfeifdrossel **Spanish**: Arrenga de Borneo
Other common names: Sunda Whistling-thrush (when treated as conspecific with *M. glaucinus* and *M. castaneus*)

Taxonomy. *Myiophoneus borneensis* Slater, 1885, Bungal Hills, near Sarawak, Borneo.
Forms a superspecies with *M. glaucinus* and *M. castaneus*; all previously treated as conspecific. Monotypic.
Distribution. Borneo.



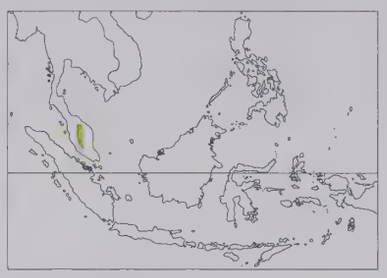
Descriptive notes. c. 25-26 cm. Male is mostly bluish-black, with vestigial blue forehead-band, bluish sheen on throat and breast, brownish-black wings with small dull blue shoulder patch (lesser wing-coverts), dark brown lower underparts; bill and legs black, soles of feet yellow. Female is plain blackish-brown, with (often concealed) purplish-blue shoulder patch. Immature has small whitish spotting on sides of head and neck, becoming large, rather streaky spotting from breast to belly; whitish lesser underwing-coverts. Voice. Calls include pleasant ventriloquial long-drawn whistle on one pitch, used in contact when moving from one spot to another; a screech (like sound made by pencil drawn across slate), a high-pitched ringing whistle (as from a coin dropping on hard surface), and a long chittering.
Habitat. Ground and lower storeys of submontane forest, usually but not exclusively along margins of rocky streams, particularly near larger boulders, often in dark ravines. Commonest at 1000–2200 m, but ranging to sea-level in some (limestone) areas, and as high as 2750 m on Mt Kinabalu.
Food and Feeding. Larger invertebrates and small vertebrates, including earthworms, crickets, beetles, snails, woodlice and frogs; also berries. Forages on ground amid leaf litter, sometimes clinging to sloping tree trunks in understorey.
Breeding. Jan–Feb and Apr, and breeding-condition bird in Nov. Nest placed in crevice on high rock or between boulders, usually adjacent to running water; in cave mouths in Bau lowlands (Sarawak). Eggs 2, cream with reddish speckles. No other information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Moderately common and widespread within relatively restricted range. Recorded from Mount Kinabalu National Park (Sabah) and Gunung Mulu National Park (Sarawak).
Bibliography. Collar (2004b), Davison (1992), Delacour (1942), MacKinnon & Phillipps (1993), Sheldon *et al.* (2001), Smythies (1999).

173. Malaysian Whistling-thrush

Myophonus robinsoni

French: Arrenga de Robinson **German**: Malaienpfeifdrossel **Spanish**: Arrenga Malayo
Other common names: Malayan Whistling-thrush

Taxonomy. *Myiophoneus robinsoni* Ogilvie-Grant, 1905, Gunung Menkuanghebah, Selangore, Peninsular Malaysia.
Monotypic.
Distribution. Mountains of Peninsular Malaysia.



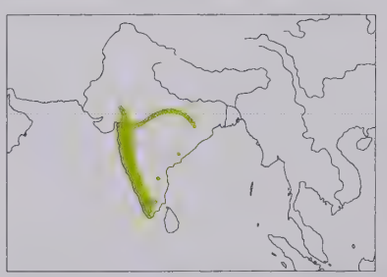
Descriptive notes. 25–26 cm; 87–105 g. Male is sooty blue-black, with shiny purplish-blue forehead-band and shoulder patch (lesser wing-coverts), and metallic purplish-blue scaling on breast and belly; bill yellow, culmen dark; legs black. Female is similar but duller, with less extensive blue feather tipping. Juvenile and immature undescribed. Voice. Song a soft mix of fluty and scratchy notes, resembling louder version of *M. caeruleus*. Call a loud, thin, high "tsiii".
Habitat. Ground and lower storeys of hill and montane evergreen forest, usually near running water, and typically in deep damp gulleys or beside small streams, at 750–1750 m; once down to 480 m. Sometimes seen on mountain roadsides in deep twilight.
Food and Feeding. Apparently no direct information on diet; inferred to be less specialized on snails than is *M. caeruleus*, if only because habitat more on granite than on limestone; presumably topsoil and leaf-litter invertebrates and small reptiles and amphibians. Forages not only on ground, but also in lower storey of forest.
Breeding. Feb–Apr and Sept; young in Mar and Sept. One nest was a large, solid cup made almost entirely of black tree-fern fibres, with a few bryophytes and dead leaves, placed in epiphytic fern on a liana 4·5 m above streambed; another was 2 m up on huge fern attached to liana; a third was 6 m up in base of large epiphytic fern in fork of riverside tree; a fourth suspected as being behind a waterfall. Eggs 1–2, pale bluish-grey with pale pinkish-brown spotting. No other information.
Movements. Presumably sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA. Relatively scarce; known from Cameron Highlands S to Genting Highlands. In recent review, six localities mapped, of which only four known to involve post-1980 records. Population presumed to be fewer than 10,000 mature individuals. Threats include conversion of habitat into farmland at lower elevations, and persistent possibility of construction of N–S road through montane forest to link various hill stations. Occurs in Cameron Highlands Wildlife Sanctuary (649 km²), in Fraser's Hill Wildlife Reserve (29 km²), and in the Malayan Nature Society Boh Tea Estate Centre, but not clear how strong the protection of habitat is at these sites. Ecological and distributional study of species to determine its numbers and needs strongly recommended.
Bibliography. Collar *et al.* (2001), Delacour (1942), Glenister (1971), Jeyarajasingam & Pearson (1999), Madoc (1965), Madoc & Allen (1952), Medway & Wells (1976), Robinson (1909, 1928), Robson (2000), Stattersfield & Capper (2000).

174. Malabar Whistling-thrush

Myophonus horsfieldii

French: Arrenga de Malabar **German**: Malabarpfeifdrossel **Spanish**: Arrenga Indio

Taxonomy. *Myophonus Horsfieldii* Vigors, 1831, Malabar, India.
Close to, and previously considered conspecific with, *M. insularis*. Monotypic.
Distribution. Hills of peninsular India.



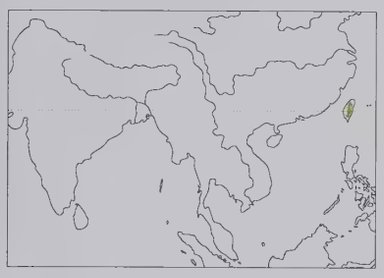
Descriptive notes. 25–30 cm; 101–130 g. Male has matt black upper body, with metallic, rather bright royal-blue forehead-band, and glossy royal-blue scaling on back, scapulars and mid-breast to belly, royal-blue edges of wings with stronger shoulder patch, deeper bluish rump and tail; bill and legs black. Female is similar, but with weaker scaling below. Juvenile is matt black, with glossy blue shoulder patch and wing edgings. Voice. Song a long unpredictable series of rich, mournful, low-pitched, uncannily human-like whistles, rambling languidly and aimlessly up and down scale at varying volumes. Call a sharp high descending "kree-ee", often in flight, sometimes repeated every few seconds.
Habitat. Margins, beds and adjacent ground of rocky hill streams and rivers flowing through forest, second growth and plantations, near and away from human settlements; from foothills to 2200 m, but reaching plains in rains. Favours areas with overhanging outcrops and rocks, also caves, but occasionally ventures into adjacent open terrain.
Food and Feeding. Chiefly aquatic insects, snails and crabs. Forages on ground, but perches readily in trees.
Breeding. Feb–Aug, varying with locality. Nest a large compact pad of roots and grasses, reinforced with mud, placed usually on shelf or ledge of rock by cascading water, occasionally in artificial site or in tree. Eggs 3–4, pale buff or greyish-stone with greyish-brown and lavender speckles and blotches; incubation period 16–17 days; no information on nestling period.
Movements. Mainly resident. Some short-distance elevational movements related to rains, and seemingly a wanderer; individual ringed in Maharashtra was killed by avian predator (c. 3·5 years later) 650 km farther S, in Karnataka.
Status and Conservation. Not globally threatened. Fairly common in Western Ghats; local in Eastern Ghats. Occurs in several protected areas, e.g. Periyar National Park.
Bibliography. Ali (1996), Ali & Ripley (1987b), Ambedkar (1991), Delacour (1942), Grimmett *et al.* (1998), McCann (1931b), Navarro (1976), Rasmussen & Anderton (2005), Sugathan & Varghese (1996).

175. **Taiwan Whistling-thrush**

Myophonus insularis

French: Arrenga de Taiwan **German**: Taiwanpfeifdrossel **Spanish**: Arrenga de Formosa
Other common names: Formosan Whistling-thrush

Taxonomy. *Myiophoneus insularis* Gould, 1863, Taiwan.
Close to, and previously considered conspecific with, *M. horsfieldii*. Monotypic.
Distribution. Taiwan.



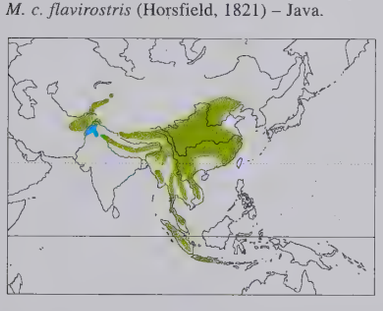
Descriptive notes. 28–30 cm. Resembles *M. horsfieldii*, but duller, with dull dark blue metallic forehead-band, duller scaling below, royal-blue wing fringes, uppertail and underpart scaling; eye red; bill and legs black. Sexes similar. Juvenile is dull blackish, with bluish-tinged wings. Voice. Song unhurried, a mix of rising and falling whistles and pleasant melodic phrases, with a few scratchy notes, followed by series of high-pitched piping notes and phrases or short trills. Calls include loud screeching "zi" or "sui yi".
Habitat. Ground and lower storeys of dense broadleaf evergreen forest, with bamboo; near gulleys with water. Mainly 400–2100 m, occasionally higher; sometimes down to sea-level in N.
Food and Feeding. Freshwater invertebrates and larvae, also earthworms, orthopterans, mantids, and frogs and lizards. Forages mostly on ground in damp areas, also on mid-stream rocks.
Breeding. Apr–Jul. Nest of moss, dead twigs, stems and roots, lined with finer material, placed in cavity among rocks, sometimes up to 12 m above ground in tree . Eggs 2–4, yellowish-pink to light pinky-buff with variable reddish-brown and greyish-lavender markings; incubation period 12–14 days; no further information.
Movements. Presumably sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Taiwan EBA. Reasonably common and widespread, mainly in lower-lying forests.
Bibliography. Chang James Wanfu (1993), Delacour (1942), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984).

176. **Blue Whistling-thrush**

Myophonus caeruleus

French: Arrenga siffleur **German**: Purpurpfeifdrossel **Spanish**: Arrenga Común
Other common names: (Large/Violet) Whistling-thrush; Himalayan Whistling-thrush (*temminckii*)

Taxonomy. *Gracula* (*caerulea*) Scopoli, 1786, Canton, China.
Race *flavirostris* has been considered possibly to merit full species status, but basis for such a separation unclear. Birds from Tien Shan S to Pamirs described as race *turcestanicus*, but considered inseparable from *temminckii*. Six subspecies recognized.
Subspecies and Distribution.
M. c. temminckii Vigors, 1832 – W Tien Shan S to Afghanistan, and E through Himalayas and E Assam to C China (E to N, W & SW Sichuan) and N & NE Myanmar.
M. c. eugenei Hume, 1873 – C, E & SE Myanmar, W, N & E Thailand, S China (C & S Yunnan) and N & C Indochina.
M. c. caeruleus (Scopoli, 1786) – C & E China.
M. c. crassirostris Robinson, 1910 – SE Thailand, Cambodia and Malay Peninsula (S to Kedah on W coast and Haadyai on E).
M. c. dichrorhynchus Salvadori, 1879 – Malay Peninsula (S of Kedah and Pattani) and Sumatra.
M. c. flavirostris (Horsfield, 1821) – Java.



Descriptive notes. 29–35 cm; 136–231 g. Male nominate race is bluish-black, upper body to rump covered with metallic violet-blue spots, with concentration from forehead to crown side; lower body, wings and tail deep dull blue, with a few silvery-grey spots on median upperwing-coverts, often concealed dull royal-blue shoulder patch (lesser wing-coverts); eye reddish, variable; bill and legs black. Female is similar but duller. Juvenile is sooty-black, with thin whitish shaft streaks on breast. Other races differ from nominate in having yellow bill with varying amount of black on culmen, and juveniles show little or no white streaking: *temminckii* is larger, with often larger shoulder patch, more distinctive forehead-band, browner eye; *eugenei* is almost identical to previous, but lacks silvery spots on median coverts; *crassirostris* is very like nominate but slightly smaller, with thicker, slightly shorter bill, underwing often with white patch at base of primaries; *dichrorhynchus* dullest race, bill slightly larger than in nominate; *flavirostris* is like last but darker, with shorter tail, and has most white on concealed belly and rump feathers. Voice. Song, given all year, generally from tree or cliff, sometimes briefly in flight, is a long disjointed string of casually melodious phrases composed of loud, clear, high-pitched, resonant, short, remarkably human-like whistles, rather high-pitched and wispy in tone, sometimes with mimicry; *eugenei* song louder; courtship song, preceding copulation, a subdued bubbling chatter interspersed with buzzing calls. Calls include strident far-carrying upslurring "tzeet tze-tze-tzeet" or "bzueeet" (at dusk and dawn as long series, starting slowly with one set of "tzeet-tzeet" every few seconds, then interspersed with shorter grating calls and ending accelerando in "tzeet-tzuit-tzuit-tzuit-zuit"); also, a loud thin shrill "skreee" or "fwiiiiii" recalling that of *Enicurus leschenaulti*, slightly downslurred, sometimes lower-pitched, shorter and more strongly downslurred.
Habitat. Broadleaf evergreen and mixed deciduous forests and more open bush with scattered larger trees, commonly in gorges and ravines; breeds at 1000–4000 m (occasionally wandering above tree-line), wintering from lowlands (sometimes in mangroves) to 2400 m. Occurs in undergrowth and ground near running water of various types, from small low-gradient rocky streams to major noisy rivers (also sometimes along mule tracks and forest paths). Typical bird of irrigated terraces in NE Burma; on Langkawi I (Peninsular Malaysia), occurs in mangrove and scrub as well as tall forest, and in Hong Kong regularly feeds on lawns of parks and gardens, and is also found on small wooded offshore islets. Sometimes seen at considerable distance from water, and enters open rocky ground and cultivated areas. Often found near limestone outcrops, and will enter caves and large drains beneath roads and culverts.
Food and Feeding. Invertebrates such as water beetles, ants and other hymenopterans, cockchafer larvae, dung beetles, slugs, snails, crabs, froglets, earthworms; also berries (in one case *Ziziphus*) and seeds. In one account, diet found to be almost exclusively snails, which are broken against rock, often leaving heaps of fragments in well-frequented areas. Grubs seen brought to nestlings. Feeds on damp ground, moving in long hops and turning over leaf litter, listening for movement, or picking its way along muddy margins and in shallow water; often forages along interstices of screes and talus, and digs vigorously in soft ground. Crepuscular. In study in Nepal, 7% of observations of foraging position involved mid-river rocks, 34% marginal rocks, 7% other positions in river, 7% shoals or marginal ground and 45% riparian grounds.
Breeding. Apr–Aug in N & W of range; Apr–Jul in Nepal; Feb–Apr in extreme S Myanmar, later in rest of country, with second broods to end Jul; Apr–Jul in SE China; Jan–May in Peninsular Malaysia; Oct–Apr in Java; double-brooded throughout range (except at highest altitudes). Nest a bulky cup of green moss and muddy moss roots interwoven with fine grass, leaf stems and skeletons, tendrils and rootlets, placed on ledge in cliff or in overhanging bank, cave or crevice by rushing water, sometimes in tree fork, in old tree cavity, under bridge or on beam or rafter in isolated bungalow or temple, once on external part of air-conditioner; nest may be reused in successive years (one for 6 years), possibly not always by same pair; sometimes new nest built for second brood. Eggs 2–5 (2–3 in Peninsular Malaysia and Java), whitish, pale bluish-grey, olive-grey, grey-green or buff with reddish or brownish freckles. Brood-parasitized by Large Hawk-cuckoo (*Cuculus sparverioides*).
Movements. Resident, but subject to vertical movements. In Himalayas winters mostly down to foothills, but in Afghanistan and N Pakistan spreads into adjacent plains. Sedentary in Myanmar, also uncommon winter visitor to E Myanmar, also to N Thailand, Laos and Vietnam.
Status and Conservation. Not globally threatened. Common in most of range wherever watercourses present. In Afghanistan, one of commonest species along rivers and side-streams in Nuristan; familiar in and near hill towns in Himalayas. Common in China, including Hong Kong. Common and widespread in Myanmar. Fairly common in Peninsular Malaysia. Uncommon in Sumatra and Java. Density in possibly optimal habitat (riverine *Alnus* vegetation) 1 pair every 250–300 m of river.
Bibliography. Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1964, 1987), Deignan (1945), Delacour (1942), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Georgie (1998), Glenister (1971), Grimmett *et al.* (1998), Herklots (1967), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), Manel *et al.* (1999), van Marle & Voous (1988), Martens & Eck (1995), Martens & Geduldig (1990), Matthews (1944), Medway & Wells (1976), Meyer de Schauensee (1984), Paludan (1959), Rasmussen & Anderton (2005), Roberts (1992), Robinson (1928), Robson (2000), Smythies (1986), Tyler & Ormerod (1993), Vaurie (1972), Way (1945), Wildash (1968).

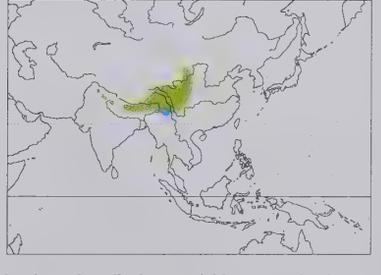
Genus *GRANDALA* Hodgson, 1843

177. **Grandala**

Grandala coelicolor

French: Grandala bleu **German**: Grandala **Spanish**: Zorzal Grandala
Other common names: Hodgson's Grandala

Taxonomy. *Gr.*(*andala*) *côelicolar* [*sic*] Hodgson, 1843, Nepal.
Position within turdine clade unclear. Highly distinctive, and has been proposed that it merits placement in its own family, Grandalidae. Earlier suggestion of relationship with *Sialia* now considered very improbable. Monotypic.
Distribution. NW Himalayas E to Bhutan, and C China (E Qinghai and SW Gansu S to N Yunnan); highland movements as far S as N Myanmar in winter.



Descriptive notes. 19–23 cm; 38–52 g. Male is shiny royal-blue, with blackish lores, wings, tail, bill and legs. Female is brownish-grey, with slight blue wash on rump, whitish streaks on head to mantle and underparts, bold white patch at base of primaries (wingbar in flight). Juvenile is like female, but lacks bluish on rump and tail-coverts, has broader streaking below, vent almost white. Voice. Song and call not well distinguished; probably no true territorial singing owing to high sociability. Vocalizations noted are a short, sweet, strongly downslurred "chyuuu" and various multi-syllabic versions, these perhaps song, which has been described as a quickly repeated quiet version of call. Calls include ringing finch-like "tji-u" or "tju-ti" (possibly only male), shrill "dee dee dee" (possibly only female), and in courtship (by male) "fit-fit-füt-fidü".
Habitat. Breeds in rugged barren high-elevation areas far beyond tree-line, boulder-strewn alpine meadows, screes, barren rocky slopes and ridges above dwarf-scrub zone, at 3900–5500 m; winters on rocky mountainsides and ridges, 3000–4300 m, sometimes as low as 2000 m.
Food and Feeding. Insects and berries, in autumn including fruit in orchard trees; stomachs from N Myanmar held fruits and seeds of *Vaccinium*. Forages mostly on ground. Gregarious, in restless flocks, with chat-like wing-flicking and tail-flicking behaviour.
Breeding. May–Jul. Nest a large cup placed on a ledge. Eggs 2, greenish-white with reddish-brown blotches over purplish undermarkings. No other information.
Movements. Mainly resident, but subject to vertical movements and some nomadism; recorded in winter in N Myanmar.
Status and Conservation. Not globally threatened. Locally abundant in Himalayas. Uncommon to locally common in China.
Bibliography. Ali (1977), Ali & Ripley (1987b), Cheng Tsohsin (1987), Collar (2004a), Desfayes (1965), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Landmann & Winding (1993), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meier (1996, 1999a, 1999b), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Vaurie (1955c, 1972), Wunderlich (2000).



PLATE 67

inches 4

cm 10

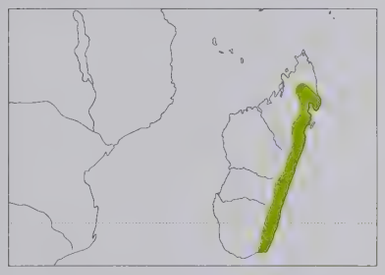
Genus *MONTICOLA* Boie, 1822

178. **Forest Rock-thrush**

Monticola sharpei

French: Monticole de forêt **German**: Madagaskarrötel **Spanish**: Roquero de Sharpe
Other common names: Forest/Sharpe's/Eastern Robin-chat

Taxonomy. *Cossypha Sharpei* G. R. Gray, 1871, forests east of Ambatondrazaka (Lake Alaotra), Madagascar.
Sometimes placed with *M. erythronotus*, *M. bensoni* and *M. imerinus* in a separate genus, *Pseudocossyphus*, although recent genetic evidence, and the shared possession of a derived juvenile plumage, supports their inclusion in present genus. Has been considered conspecific with one or all of these. Described races *salomonseni* and *interioris*, from C & S parts of range, appear untenable. A possibly undescribed rock-thrush, reported from W Madagascar, is evidently intermediate in plumage between present species and *M. erythronotus*. Monotypic.
Distribution. E Madagascar.



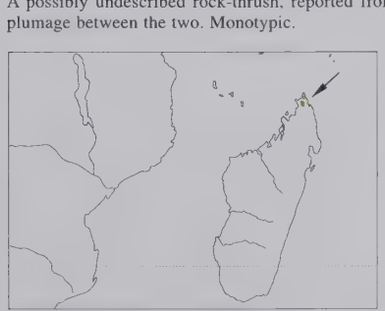
Descriptive notes. 16 cm; 25 g. Male has head to upper breast and mantle dull grey-blue, wings darker; remaining underparts orange; tail dark brown centrally and terminally, with rump and outer tail feathers basally russet-orange; bill and legs blackish. Female is mid-brown above, rump and tail as male, paler below, with whitish chin, buff streaking radiating and dissipating from upper breast; bill black, legs pinkish-grey. Juvenile is as female, but speckled pale below and above, bill yellowish. Voice. Song made up of various quiet, clear, wavering, melodious whistles, separated by pauses of several seconds; most common is a melancholy "teeooo teeooo teeooo"; capable of mimicry. Calls include quiet "tseet-tak-tak", "hjutt-tock-tock" or "tak-tak-tak" in alarm; high "hweet" or "weed", repeated at long intervals, for contact; and low staccato "krrrrr" in annoyance.
Habitat. Canopy and ground of middle-altitude, transitional plateau and montane evergreen humid forest with fairly open to open understorey; less often, secondary woodland, exotic tree plantations, forest edge and open scrubby areas next to ericoid high-altitude forest. Often, and probably by preference, in vicinity of streams and wooded creeks. Many breeding records at 1260–1550 m; overall altitudinal range 800–2500 m.
Food and Feeding. Insects, berries and fruit. Hawks terrestrial prey from low perch on branch, stump, stone or on ground, where may sit motionless for long periods, even when approached. Food taken from leaf litter, from mossy or lichen-covered tree limbs and trunks, and sometimes in canopy. Female spends more time on ground than does male. Often forages at edge, up to 50 m from closed forest.
Breeding. Oct–Feb; birds in breeding condition and adults carrying food and nesting material Sept and Nov, juveniles Nov–Dec, and several nests found in Nov. Nest a cup of plant material, mainly moss, lined with rootlets, usually placed in crevice in tree trunk, sometimes in bush, rocky crevice, fork of thick branch, under protruding root, once in wall of abandoned shelter, 0·3–6 m above ground. Eggs 2–3 (largest brood recorded 3). No other information.
Movements. Sedentary, so far as is known.
Status and Conservation. Not globally threatened. Restricted-range species: present in East Malagasy Wet Forests EBA. Locally uncommon to fairly common, but elusive; patchily distributed.
Bibliography. Andrianarimisa *et al.* (2000), Benson *et al.* (1977), Clement & Hathway (2000), Dee (1986), Farkas (1973b), Goodman & Weigt (2002), Goodman *et al.* (1997), Goodwin (1956), Hawkins *et al.* (1998), Jones & Swinnerton (2000), Langrand (1990), Milon *et al.* (1973), Morris & Hawkins (1998), Rand (1936), Safford & Duckworth (1990), Stattersfield *et al.* (1998), Thompson & Evans (1991).

179. **Amber Mountain Rock-thrush**

Monticola erythronotus

French: Monticole de l'Ambre **German**: Ambrerötel **Spanish**: Roquero de Lavauden

Taxonomy. *Cossypha sharpei erythronota* Lavauden, 1929, Amber Mountain, north Madagascar.
Sometimes placed with *M. sharpei*, *M. bensoni* and *M. imerinus* in a separate genus, *Pseudocossyphus*, although recent genetic evidence, and the shared possession of a derived juvenile plumage, supports their inclusion in present genus. Often considered conspecific with *M. sharpei*. A possibly undescribed rock-thrush, reported from W Madagascar, is evidently intermediate in plumage between the two. Monotypic.



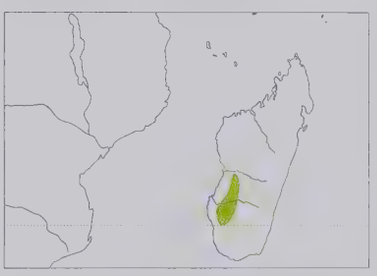
Distribution. Montagne d'Ambre (Mt Amber), in N Madagascar.
Descriptive notes. 16 cm. Male is very like male *M. sharpei*, but with slightly larger bill, bluer on head and extending only to throat and nape; mantle to wing-coverts dull chestnut, rump orange, outer tail bright orange. Female is like female *M. sharpei*, but warmer above, with brighter rufous on rump and tail, paler and less streaked below. Juvenile is poorly known; captive juvenile male had buffy spots on wing-coverts and pale edges to secondaries. Voice. Song poorly known, described as high-pitched and harmonious, or rich and short, often given at dusk, and including phrases similar to those of *M. sharpei*, but generally much less varied and consisting of a number of highly stereotyped melodies; capable of mimicry. Alarm call a peculiar harsh shriek.
Habitat. Montane evergreen humid forest and mistforest in areas with discontinuous canopy, thus creating fairly luxuriant understorey of lianas, ferns, shrubs, *Pandanus*, grass and debris, mostly at 800–1300 m. Often, and apparently preferably, in vicinity of streams, and utilizing undergrowth much more than does *M. sharpei*.
Food and Feeding. Forages on ground and in understorey. Usually catches terrestrial prey in pounce from perch; sometimes takes aerial prey in agile sally.
Breeding. Oct–Nov. Largest territory 2·5 ha, normally c. 1 ha. Nest similar to that of *M. sharpei*, placed in tree hollow, in crevice under overhang, on trunk of tree-fern, or often hidden among *Pandanus* leaves 3–6 m above ground. Eggs 2–3, pale unspotted turquoise; incubation period at least 15 days; nestling period unknown; post-fledging dependence c. 1 month.
Movements. Sedentary, so far as is known.
Status and Conservation. Not globally threatened. Requires evaluation of its global conservation status, following recent elevation to full species; has been suggested as likely to be globally threatened. Restricted-range species: present in East Malagasy Wet Forests EBA. Common within localized range.
Bibliography. Clement & Hathway (2000), Farkas (1973b), Goodman & Weigt (2002), Langrand (1990), Milon *et al.* (1973), Morris & Hawkins (1998), Rand (1936), Sinclair & Langrand (1998), Stattersfield *et al.* (1998).

180. **Benson's Rock-thrush**

Monticola bensoni

French: Monticole de Benson **German**: Bensonrötel **Spanish**: Roquero de Benson
Other common names: Benson's/Farkas's Robin-chat

Taxonomy. *Monticola bensoni* Farkas, 1971, Ankarefu, Antinosy, south-west Madagascar.
Sometimes placed with *M. sharpei*, *M. erythronotus* and *M. imerinus* in a separate genus, *Pseudocossyphus*, although recent genetic evidence, and the shared possession of a derived juvenile plumage, supports their inclusion in present genus. Has recently been treated, on basis of genetic, morphological and distributional evidence, as conspecific with or even synonymous with *M. sharpei*, but song is reportedly distinct, raising possibility that genes studied have evolved more slowly than those expressing these characters; further research required. Monotypic.
Distribution. SC & SW Madagascar.



Descriptive notes. 16 cm; 24–28·5 g. Male is very like male *M. sharpei*, but head, upper breast and mantle blue-grey; upperparts blue-grey, except for orange rump and uppertail-coverts; underparts orange from breast down; bill and legs black. Female is very like female *M. sharpei*, but greyer brown above, usually with pale eyering. Juvenile has pale centres of back and breast feathers; male differs from adult in having lighter grey speckles on head and narrow light grey band across belly, female has plumage entirely grey, speckled with light grey, except for rufous-brown tail. Voice. Song, by male from conspicuous perch on exposed rock, sometimes treetop, a fairly quiet, rambling series of short whistled phrases mingled with chacking and scratchy notes, also mimicry; may also be given during display-flight involving vertical ascent, then sloping glide. Calls include high-pitched "veed" for contact, and deep, quiet "tak-tak-tak" in alarm.
Habitat. Semi-arid rocky country, including slopes with large boulders, cliffs and gorges with adjacent scant to bushy vegetation (including dry deciduous woodland patches in W of range), at 400–2580 m; sometimes forages in patches of adjacent high forest. Readily recolonizes areas of burnt ground and regenerating tree-heath (*Philippia*).
Food and Feeding. Invertebrates. Forages by hopping about on rocks and sometimes among rocky vegetation, making sometimes long and acrobatic sally-flights. May also use poles, wires and walls as vantage points.
Breeding. Recorded Dec–Jan, thus probably a late-summer breeder or perhaps double-brooded. Nest is a bowl of fine roots and leaf stalks, placed in a hollow or crevice in a rock face; two nests were 2 m and 8 m above ground; recorded also as nesting on buildings. No further information available.
Movements. Possible evidence of winter dispersal.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in West Malagasy Dry Forests EBA, and Isalo Massif Secondary Area. Recently found to have relatively broad range within a triangle extending from Isalo Massif to Mangoky Valley and Andringitra, and broader altitudinal tolerance than was previously thought. Present in Isalo, Andringitra and Zombitse-Vohibasia National Parks. Sparser at higher altitudes, with densities varying from 1·61 males/ha at 700 m (Isoky-Vohimena) to 1·02 males/ha at 2050 m, and 0·34 males/ha at 2450 m (Andringitra).
Bibliography. Clement & Hathway (2000), Collar (1999), Collar & Stuart (1985), Collar & Tattersall (1987), Dee (1986), Farkas (1971), Goodman & Benstead (2003), Goodman & Weigt (2002), Johnson & Stattersfield (1990), Langrand (1990), Langrand & Goodman (1996), Milon *et al.* (1973), Morris & Hawkins (1998), Sinclair & Langrand (1998), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

181. **Littoral Rock-thrush**

Monticola imerinus

French: Monticole du littoral **German**: Dünenrötel **Spanish**: Roquero Litoral
Other common names: Littoral Robin-chat

Taxonomy. *C.(ossypha) imerina* Hartlaub, 1860, St Augustine Bay, south-eastern Madagascar.
Sometimes placed with *M. sharpei*, *M. erythronotus* and *M. bensoni* in a separate genus, *Pseudocossyphus*, although recent genetic evidence, and the shared possession of a derived juve-

On following pages: 182. Cape Rock-thrush (*Monticola rupestris*); 183. Sentinel Rock-thrush (*Monticola explorator*); 184. Short-toed Rock-thrush (*Monticola brevipes*); 185. Miombo Rock-thrush (*Monticola angolensis*); 186. Common Rock-thrush (*Monticola saxatilis*); 187. Little Rock-thrush (*Monticola rufocinereus*); 188. Blue-capped Rock-thrush (*Monticola cinclorhynchus*); 189. White-throated Rock-thrush (*Monticola gularis*).

nile plumage, supports their inclusion in present genus. Has been considered conspecific with one or all of these. Monotypic.
Distribution. Coastal SW & S Madagascar.



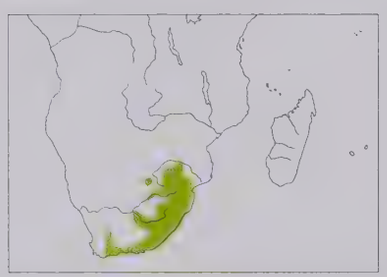
Descriptive notes. 16 cm. Sexes like respective sexes of *M. sharpei*, but longer-billed, with no rufous in tail; male much greyer on head, breast and mantle; female greyer, with pale orange-tinged rump, and unstreaked below. Juvenile is like female, but mottled whitish above; young male soon acquires orange flecks. Voice. Song consists of various repeated short scratchy phrases, including "cheearr tu-tu-tu", and longer phrases mingling clear whistles with scratchy notes. Alarm call a quiet "kirr-tak-tak-tak".
Habitat. Sub-arid sandy coastal shrubland, often on dunes or coral rag, having medium-sized (up to 4 m tall) shrubs interspersed with *Euphorbia stenoclada*; reported also from loosely wooded savanna and *Didierea*. Sea-level to 200 m.
Food and Feeding. Berries, fruit and insects. Forages by hopping along ground; if disturbed, flies to higher perch and adopts characteristic upright posture, with bill pointing upwards. Also searches for prey from perches on termitaria or pieces of limestone.
Breeding. Oct–Feb. Territory size estimated at 1 ha. Nest a bowl made of lichens, moss and other fibrous material, strengthened with feathers, bits of snakeskin and twiglets, with lining of softer material; usually suspended among branches, supported below by twig, 1·5–3 m above ground in *Euphorbia stenoclada* tree. Eggs 3, plain turquoise; nestling period 18 days in captivity. No other information.
Movements. Sedentary, so far as is known.
Status and Conservation. Not globally threatened. Restricted-range species: present in South Malagasy Spiny Forests EBA. Abundant within its small range. Tolerant of areas grazed by livestock and near villages, although scarcer towards Fort Dauphin.
Bibliography. Clement & Hathway (2000), Dee (1986), Farkas (1974), Goodman & Weigt (2002), Goodman *et al.* (1997), Goodwin (1956), Langrand (1990), Milon *et al.* (1973), Morris & Hawkins (1998), Rand (1936), Stattersfield *et al.* (1998).

182. Cape Rock-thrush

Monticola rupestris

French: Monticole rocar **German**: Klippenrötel **Spanish**: Roquero de El Cabo

Taxonomy. *Turdus rupestris* Vieillot, 1818, Table Mountain, near Cape Town, South Africa. Monotypic.
Distribution. South Africa, Lesotho and Swaziland, marginally into SE Botswana and SW Mozambique.



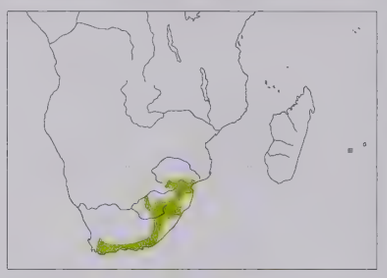
Descriptive notes. 21–22 cm; 60–64 g. Male has head and throat grey-blue, clear-cut against dull orange-brown underparts, orange continuing on to rump and outer tail and as narrow but complete collar; mantle and scapulars mid-brown with darker mottling; wings and central tail brown with buffy-rufous fringes. Female is as male, but head dull greyish with indistinct whitish mottled submoustachial and mesial stripes, and dark-streaked crown merging with mantle and often dark-scalloped underparts. Juvenile is blackish-brown on head and mantle, with buffish mottling above, heavy reddish-buff fringes to wing feathers, heavier dark scalloping below; rump and tail as adult. Voice. Song, by both sexes, a short series of short phrases (2–5 seconds long, with intervals of 1–2 seconds) composed of several varied clear, rich sweeping whistles linked with "ch" and "see" sounds and sometimes ending with trill, e.g. "wiit liio-o pii'p sii piiu chiwii trrr". Call a mournful whistle for contact; in alarm a sharp harsh "charr". Mimics both songs and calls of other species.
Habitat. Relatively mesic mountainous terrain, mainly rocky mountain slopes, screes, cliffs, gorges, quarries, with scattered bushes, small trees or old buildings; occasionally also open, especially burnt, grassland in woodland, fynbos, and gardens in winter. Occurs only to 2500 m in Lesotho, where generally replaced by *M. explorator* at higher altitudes. On Western Cape coast, forages also in intertidal zone.
Food and Feeding. Insects, spiders, millipedes, centipedes, molluscs, small frogs, fruits (including olives), seeds and nectar. Stomachs of six birds from throughout year in Free State (South Africa) held, by number, 48% berries, 33% seeds, 6% millipedes, 3% spiders, 3% beetles, 3% hymenopterans, 2% insect larvae and 1% each of cockroaches and termites. Nestlings fed with moths, caterpillars, hymenopterans, orthopterans, Odonata, insect larvae, spiders, millipedes and centipedes. Forages on ground, among rocks or tussocky grass; sometimes in trees and at flowering aloes.
Breeding. Sept–Feb, earliest peak (Sept–Nov) in W, in South Africa; sometimes double-brooded. Nest bulky, made of coarse grass on platform of twigs, rootlets and earth, sometimes with pieces of aloe leaf, lined with fine rootlets and hair, 3–20 m up on sheltered rock ledge or crevice, in hole in wall, on ledge under bridge or roof, or in leaf rosette of aloe; sites often reused over years. Eggs 2–4 (usually 3), pale blue or cream, plain or with light spotting of reddish or yellowish-brown and grey; incubation period 14–16 days; nestling period 16–17 days. Nests sometimes parasitized by Red-chested Cuckoo (*Cuculus solitarius*), e.g. 6·6% of 76 nests in study.
Movements. Mainly sedentary; some local altitudinal movements from supalpine zone of Lesotho and Drakensberg during winter.
Status and Conservation. Not globally threatened. Locally common from Cape Town E to Swaziland and N Northern Province of South Africa. Uncommon E of 31° E and in Lesotho, where some habitat may have been destroyed by flooding of river valleys. Density 1 pair/km of river valley in Lesotho.
Bibliography. Bonde (1993), Broekhuysen (1941), Clement & Hathway (2000), Farkas (1962a, 1964), Ginn *et al.* (1989), Harrison *et al.* (1997), Kopij (2003), Kuiper & Cherry (2002), Lockhart (1983), Macdonald & Birkenstock (1980), Maclean (1993), Meinertzhagen (1951), Payne & Payne (1967), Sinclair (1984), Sinclair & Ryan (2003), Skead (1966), Tarboton (2001), Urban *et al.* (1997).

183. Sentinel Rock-thrush

Monticola explorator

French: Monticole espion **German**: Langzehenrötel **Spanish**: Roquero Centinela

Taxonomy. *Turdus explorator* Vieillot, 1818, mountains of the Cape of Good Hope, South Africa. Darker birds from Lesotho E to S Mozambique described as race *tenebriformis*, but characters appear inconstant and variation clinal. Monotypic.
Distribution. E & S South Africa, Lesotho and S Mozambique.



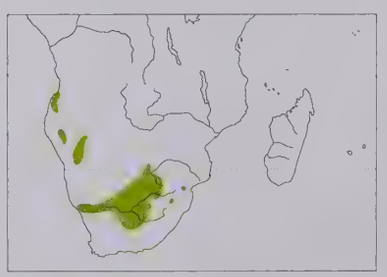
Descriptive notes. 16·5–18 cm. Male has head, mantle to lower back, scapulars and breast greyish-blue, rump and rest of underparts orange-brown, wings slaty with buffy fringes, central tail and tail tips dark brown, outer tail orange. Female is medium to palish brown, with darker, pale-fringed wings, ragged broad buff chin/throat and submoustachial radiating out in irregular weakening breast streaks and brown mottling, latter extending to flanks; rest of underparts pale buffy-orange; tail duller than male's. Juvenile is like female but lightly spotted above, with broader buff margins of wing feathers, dark brown scaling below; first-year male like dull adult, with buffish-red flecking on more grey-blue upperparts. Voice. Song (male) a short series of a standard phrase consisting of bold, lively warble lasting 3 seconds, with intervals of 6 seconds or more, warble composed of up to c. 12 varied whistles and chattering trills, "worr, chilli-chilli, worr, triio, triio, worr"; female often interpolates a short descending trill during male's song. Call in alarm a soft chattering "i-i-i-ii-ii-ii-i"; other calls include dull clucking at dawn and often followed by rasping, grating "tjerr-tjerr-tjerr" repeated 5–8 times, followed by "eeeyou" 2–5 times or a "cheeur" note.
Habitat. Upland grassland and sheep pasture with scattered rocky outcrops and ridges, stony or boulder-strewn grassy mountainsides, generally at higher altitudes (up to 3200 m in Lesotho, above 2000 m in NE), mountain fynbos, and occasionally around human settlements, especially at high altitudes; mine dumps in one area. In non-breeding season may occur in recently burnt veld, unwooded grassland, and cleared plantations; also locally lower in austral winter, down to 600 m and a few near sea-level in S.
Food and Feeding. Insects, including ants, beetles, moths, caterpillars and pupae, also fruit and seeds; millipedes fed to young. Stomachs of five birds from throughout year, Free State (South Africa), held eight items: six beetles, one orthopteran and one millipede. Forages by hopping and bounding among grass tufts and rocks.
Breeding. In South Africa, Oct–Dec in N of range, Sept–Dec in KwaZulu-Natal and Aug-Oct in Western Cape; Sept–Feb in Lesotho; sometimes double-brooded. Nest a truncated cone, large and untidy, with foundation of grass, twigs and roots, walls of grass, moss and lichen, lining of fine grasses and rootlets, placed on ground in tight overhung crevice under rock slab, less often under dense vegetation (such as grass tuft) without rock cover; sites often reused in subsequent years. Eggs 2–4, usually 3, sky-blue or greenish-blue, occasionally with reddish-brown spots; incubation period 13–15 days; nestling period 16–18 days.
Movements. Some altitudinal movement, with post-breeding descent to lower levels in S; occasionally winters at coast in KwaZulu-Natal, and regularly Jun–Aug in S Mozambique (Lebombo Mts), although little evidence that this movement is regular or involves large numbers of individuals. Populations in Lesotho and Drakensberg mainly resident, but move to lower altitudes in extreme winters.
Status and Conservation. Not globally threatened. Fairly common above 1200 m in South Africa; common above 2500 m in Lesotho, where it thrives in overgrazed areas. In optimum habitat, density reaches 1 pair/500 m, or 3–12 birds/km².
Bibliography. Bonde (1993), Broekhuysen (1965), Brooke (1984b), Brown & Barnes (1984), Clancey (1952, 1980), Clement & Hathway (2000), Farkas (1963, 1964), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockey *et al.* (1989), Johnson & Maclean (1994), Kopij (2003), Maclean (1993), Meinertzhagen (1951), Sinclair (1984), Sinclair & Ryan (2003), Skead (1995), Tarboton (2001), Tarboton *et al.* (1987), Urban *et al.* (1997).

184. Short-toed Rock-thrush

Monticola brevipes

French: Monticole à doigts courts **German**: Kurzzehenrötel **Spanish**: Roquero de Namibia
Other common names: Transvaal Rock-thrush

Taxonomy. *Petrocincla brevipes* Waterhouse, 1838, 'Tans Mountain, Damaraland, near Walvis Bay, Namibia.
Race *pretoriae* has been considered a separate species, but intergrades with nominate in Kuruman District of Northern Cape, in South Africa. Parapatric with *M. angolensis*. Two subspecies recognized.
Subspecies and Distribution.
M. b. brevipes (Waterhouse, 1838) – W Angola, Namibia and NW South Africa (Northern Cape).
M. b. pretoriae Gunning & Roberts, 1911 – SE Botswana, C South Africa (E from E Northern Cape) and Swaziland.



Descriptive notes. 18 cm; 33 g. Male nominate race has forehead to mid-crown whitish, shading to mid-grey on nape and mantle, grey extending around to throat and enclosing dark grey facial area from lores to ear-coverts; wings blackish with greyish-white fringes; underparts orange-brown, extending to rump and outer tail; central tail and tips blackish. Female is like male, but crown to mantle dull grey-brown, no dark face patch, chin to upper breast with thick creamy streaks and small black fleckings and scalloping. Juvenile has dark grey head heavily spotted buff, belly buffy with vague scaling, rump rufous with light scaling, broad buff fringing on wings. Race *pretoriae* male has white of crown extending to nape and shading to mid-grey on mantle, female darker and browner. Voice. Song like that of *M. explorator* but without

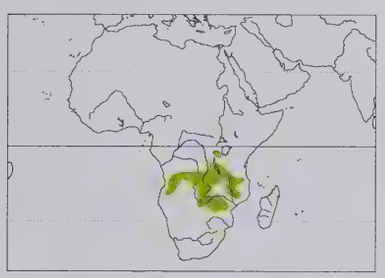
the trills, typically lasting c. 4 seconds with pause of 1–2 seconds, but sometimes phrases run together into longer passages; reputedly mimics other species. Commonest call "tseeep".
Habitat. Dry mountainous or broken country with trees or tall scrub, including grassy slopes with rock outcrops, escarpments, inselbergs, kopjies, quarries, stone buildings in open grassy areas, river valleys with bushes and trees; occasionally also houses and in flat rocky country, especially in non-breeding season. At c. 200–2200 m in Angola.
Food and Feeding. Insects, scorpions, seeds, fruits (including fallen olives); small gecko once seen fed to nestlings. Stomachs of four birds from throughout year, Free State (South Africa), held, by number, 47% termites, 34% hymenopterans (ants), 11% seeds, 4% beetles and 1% each orthopterans, insect larvae, millipedes and berries. Forages on ground among rocks, hopping quickly to new position and pausing to look and listen, then making rapid downward lunge; occasionally feeds also on rooftops. Often perches on telephone wires and fences.
Breeding. Oct-Mar in Namibia, Aug–Dec in Botswana and Sept–Jan in C South Africa (North West Province). Nest a bulky cup of dry grass, stems and roots, lined with fine grass, hair and rootlets, placed in hollow beneath rocks and grass tufts, or among roots of bush or fig tree growing on sheer rock. Eggs 2–3, usually 3, unmarked pale blue or greenish-blue; incubation period 13–14 days; nestling period 16 days.
Movements. Considerable post-breeding displacements occur, with birds dispersing to occupy winter territories in lower-lying areas adjacent to breeding range.
Status and Conservation. Not globally threatened. Common throughout most of range. No recent evidence for existence of suggested isolated population in Lebombo Mts, in E Swaziland.
Bibliography. Brown (1993), Clancey (1968, 1972a), Clement & Hathway (2000), Dean (2000), Earlé & Grobler (1987), Farkas (1962b, 1966b, 1979), Harrison *et al.* (1997), Kopij (2003), Maclean (1993), Parker (1994), Penry (1982, 1994), Sinclair (1984), Sinclair & Ryan (2003), Skinner (1995), Tarboton (2001), Tarboton *et al.* (1987), Urban *et al.* (1997), Vernon (1973), White (1967).

185. Miombo Rock-thrush

Monticola angolensis

French: Monticole angolais **German**: Miomborötel **Spanish**: Roquero Angoleño
Other common names: Angola/Mottled Rock-thrush

Taxonomy. *Monticola angolensis* Sousa, 1888, Caconda, Benguella, Angola.
Parapatric with *M. brevipes*. Geographical variation possibly mainly clinal, plumage becoming paler from E & N to S, and races intergrading; species perhaps better treated as monotypic. Two subspecies tentatively recognized.
Subspecies and Distribution.
M. a. angolensis Sousa, 1888 – Angola and S DRCongo E to N, S & SW Tanzania and Rwanda and S to N Zambia.
M. a. hylophilus Clancey, 1965 – S Zambia, W Malawi, W Mozambique, NE Botswana and Zimbabwe.



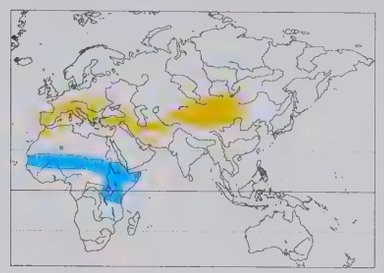
Descriptive notes. 18 cm; 44 g. Male nominate race is pale blue-grey on head, throat, mantle and back, with very variable amounts of blackish streaking and mottling from mid-crown backwards (may appear unmarked); wings variably blackish; underparts, rump and outer tail dull orange (shading to buff on vent), central tail and tips variably blackish. Female is a stippled version of male, darker above, chin/throat and submoustachial whitish, obvious dark malar and vertical subocular streaks; whiter below, orange areas with variably indistinct to strong barring. Juvenile is blackish with whitish dotting and mottling above, whitish below, with greyish barring on breast and flanks, pale rusty grey-flecked rump and outer tail. Race *hylophilus* male is paler orange below, belly to vent white. Voice. Song a series of short, measured, slightly differing, sweet whistled phrases 2 seconds long, with 2-second pause, "whiiiuu siiu hetchr… whiiiuu'u'u siiti siiti… hiiiu'u tch situ situ…"; reputedly mimics other birds. Call a fluty 2-note whistle, "cooee", second note higher; a chatter in alarm.
Habitat. Miombo (*Brachystegia*), *Uapaca* and mutemwa or gusu (*Baikiaea*) woodland in hilly plateau country, including "mountain acacia" (*Brachystegia glaucescens*) woodland and edges of eucalypt plantations up to 5 km from nearest *Brachystegia*; also recorded from a wattle plantation and from gallery forest. Elevational limits unclear in many areas, but 900–1550 m in Malawi, 600–2000 m in Tanzania, and to 2150 m on Nyika Plateau, and 650–1500 m in Zimbabwe, 1800 m in DRCongo; in Angola, from near sea-level to c. 2250 m (on Mt Moco).
Food and Feeding. Ants, termites, beetles, crickets, moths, spiders, centipedes and small worm-lizards (Amphisbaenidae). Stomach of one bird held two slow-worms (Anguidae), three centipedes, one grasshopper and three coleopterans. Nestlings seen fed with lepidopteran larvae, chafer grub, false wireworm, spiders, cockroaches, crickets and a blind snake (*Typhlops*). Forages mainly on the ground among leaf litter or vegetation, and under logs and bark.
Breeding. Sept and breeding-condition birds Aug and Oct in Angola; Jul–Oct in DRCongo; Sept–Oct and Dec in Zambia; Sept–Dec in Malawi; Aug–Jan (peak Sept–Oct) in Zimbabwe. Nest a very variably sized cup depending on site, made of fine or wiry grass and rootlets, lined with fine dry grass and tendrils, usually with base of twigs and coarse grass, placed 1–3 m up in hollow in stump, trunk or branch of *Uapaca kirkiana* or other tree; same site may be used in successive years. Eggs 2–4 (usually 3), turquoise to bluish-white, plain or with sparse reddish-brown speckling; incubation period 13·5–15 days; nestling period 18·5–20 days; juveniles may remain with parents for at least 3–6 months after fledging. One pair raised three broods inside 3 months, and 23 young in same place over 3 years. Average nesting success at eight nests 37%, with mean of 1·1 fledglings per attempt.
Movements. No clear evidence of seasonal movements, but in Tanzania reported as locally numerous at Songea Mar–Sept (prior to known breeding period); some records at lower altitudes in Malawi. Sedentary in Zambia.
Status and Conservation. Not globally threatened. Extremely common in S savannas of Itombwe region, in E DRCongo; fairly common in SW Tanzania; locally common throughout C plateau in Angola; fairly common throughout Zambia; fairly common in Mozambique, where probably under-recorded in C & N. Now patchy and local on C plateau in Zimbabwe, where formerly widespread and common; one of first species to disappear after woodland disturbance. Distribution within miombo woodland local, with seemingly suitable habitat unoccupied, possibly owing to lack of nesting holes.
Bibliography. Benson (1971a), Benson & Benson (1977), Britton (1980), Brooke (1958), Chapin (1953), Clancey (1965a, 1996), Clement & Hathway (2000), Dean (2000), Farkas (1968), Ginn *et al.* (1989), Harrison *et al.* (1997), Harwin *et al.* (1994), Irwin (1981), James (1951), Kirkpatrick (1993), Koen (1988), Lippens & Wille (1976), Maclean (1993), Masterson & Weaving (1975), Oatley (1969), Prigogine (1971), Sinclair (1984), Sinclair & Ryan (2003), Steyn (1996), Swynnerton (1908), Tarboton (2001), Traylor (1962), Tree (1994, 1995), Urban *et al.* (1997), Vernon (1968, 1973).

186. Common Rock-thrush

Monticola saxatilis

French: Monticole merle-de-roche **German**: Steinrötel **Spanish**: Roquero Rojo
Other common names: European/Mountain/Rufous-tailed/Spotted Rock-thrush

Taxonomy. [*Turdus*] *saxatilis* Linnaeus, 1766, Switzerland.
Birds from E Turkey described as race *coloratus*, supposedly deeper rusty below, but this unconfirmed by recent field and museum studies. Monotypic.
Distribution. Mountains from S & C Europe and NW Africa E to SW & C Asia (E to L Baikal, Inner Mongolia and C China); non-breeding sub-Saharan Africa.



Descriptive notes. 16–19 cm; 40–65 g. Male has bright blue (slightly grey-tinged) head, upper mantle and throat, with ragged-edged white back patch, brownish-grey wings, rump and central tail, with orange underparts, uppertail-coverts and outer tail. Female is greyish-brown with weak buffish spotting and scaling above, orange-buff with strong grey-brown scaling below, whitish chin and plain orange-buff on vent; tail as male. Juvenile is like female but more heavily marked above, including broader buff wing fringing; first-summer male shows traces of scaling above and below. Voice. Song (by both sexes, mainly male) a measured series of varied phrases lasting 1·5–4·5 seconds with at least 2-second pause, each phrase consisting of 6–12 mainly sweeping, rich, fluty notes interspersed with grating sounds, trills and some mimicry, e.g. "chip chip chip chip tell r-r-r-r-r tu tu wechoo tu wechoo"; drier than songs of congeners; sometimes in flight, then becoming more of a medley and with more mimicry, and in territorial disputes song again becomes more extended and continuous. Subsong reported from winter quarters, Kenya. Calls include high, short rich "tsut"; low "tak", sometimes "tak-tak-tak", in contact, becoming emphatic "tchak-tchak-tchak" in fright; frequently repeated, quiet staccato but mournful whistle, "tuit", in alarm; also clear "diu", squeaky "viht" and low rattling "kschrrr".
Habitat. Breeds on wild rocky mountainsides and high hills with scattered shrubs and sporadic grass cover, rocky heaths, extensive limestone screes, lava flows, eroded canyons, crags, open riverbeds, scrubby river gorges, boulder-strewn alpine meadows, upland farmland with stone walls and buildings, rocky ravines and valleys with stunted trees. In Switzerland from 500 m but mainly, both there and in NW Africa, above tree-line at 1500–2700 m; in Spain 1250–2300 m, in Turkey 1500–4000 m. Breeds in Afghanistan and Pakistan on open rocky slopes, visiting riverine willow scrub, at 2700–3000 m. On passage uses wide variety of habitats, including sea cliffs and lowland acacia scrub, and reaching to 5000 m in W Himalayas. Winter habitat less specific: occurs in open areas adjacent to gallery forest (Sierra Leone), rocky areas exposed by mining work (Liberia), degraded savanna woodland with gulley erosion and scrub, recently burnt areas and rocky desert (Nigeria), grassland, open boulder-strewn moorland, cliffs, villages and buildings (Eritrea), thorny and broadleaf woodland and grassland (Ethiopia), part-burnt grassland with scattered trees, bushes and buildings (E Africa); increasing presence around new concrete structures such as factories and aircraft hangars in Nairobi region (Kenya).
Food and Feeding. Invertebrates, mainly insects; also some fruit and berries. In Europe, beetles of at least seven families, grasshoppers and caterpillars are main prey, but list also includes crickets, bush-crickets, mole-crickets, damselflies, dragonflies, earwigs, flies, bees, wasps, ants, spiders, centipedes, millipedes, earthworms, molluscs, small lizards and frogs; also fruit of *Prunus*, *Ribes*, *Sambucus*, *Sorbus*, *Spiraea*, *Viburnum* and *Vitis*. In Hungary, Apr and Jul, three stomachs held 16 beetles, 18 wasps and bees, six orthopterans and one millipede; in Armenia, one held only *Melolontha* beetles. In Ukraine, stomachs of seven birds, Jun–Sept, contained, by number, 45% beetles (mostly Tenebrionidae), 40% hymenopterans (22% wasps, 13% bees, 5% ants), 8% bush-crickets, 6% small caterpillars and 1% earwigs. In non-breeding quarters, stomachs of Kenyan birds held beetles, grasshoppers, snails and berries; in DRCongo four held insects, including ants, a millipede and fruits; in Liberia one individual had eaten only winged black ants; in Tanzania, birds seen to take mulberries (*Morus*). Food brought to nestlings in Hungary comprised 30% lepidopterans (especially *Saturnia* caterpillars), 25% orthopterans, 20% beetles, 5% dragonflies, and 20% unidentified insects, also occasionally small snails, lizards and frogs. Forages, often on grassy patches within rocky terrain, by scanning from perch on rock, roof or tree, then dropping or flying down to ground, taking prey, often searching for further food, then returning to perch; occasionally sallies after flying insects, and takes fruit direct from tree. Of 116 items in Kenya, 96% were taken on ground, and in 50% of sorties to ground more than one prey item was taken.
Breeding. Apr–Jun in NW Africa, May–Jun in Europe and end Apr to mid-Jul in Israel; May–Jun in Afghanistan and Pakistan; May to early Aug in Mongolia and May–Jul in China; double-brooded in some areas. Territory size 8–13 ha in Italy, but one territory in S France only 3·5 ha. Male performs display-flights over territory. Nest a neat flat cup of coarse grass, rootlets and moss, lined with moss and fine rootlets, placed under rock overhang or in horizontal rock crevice, wall or ruin, sometimes under boulder on steep hillside and occasionally in tree hole; site often used successively, including from year to year. Eggs 4–6, greenish-blue to pale blue, plain or with faint rufous speckling; incubation period 13–15 days; nestling period 14–16 days; post-fledging dependence 3–4 weeks.
Movements. Wholly migratory, unless some NW African breeders remain in area (e.g. on Tangier Peninsula); nocturnal migrant, travelling solitarily or in loose groups, sometimes with *M. solitarius*. With exception of small number wintering in S Arabian Peninsula, entire population occupies Africa for winter period, Sept/Oct–Mar/Apr; great majority in region from E Chad E to Ethiopia and Tanzania, these presumably birds breeding from E Europe E to China, Chinese breeders thus travelling at least 7500 km; W Africa occupied by birds from W & C Europe. Reports of wintering in tropical Asia unsubstantiated. In autumn first-years move slightly earlier than adults, and in spring males slightly earlier than females. European populations begin to disperse from breeding areas Aug, most leaving by end Sept; appear to fly direct, on broad front, to first sub-Saharan destinations, sometimes making landfalls at oases and on high mountains; reach Chad mid-Oct, Nigeria late Nov; spring emigration from sub-Saharan areas mainly complete by mid-Mar, with lingerers to mid-Apr, and passage on N African coast Mar–May (peak late Mar to early Apr), although some (probably all males) may fly direct to S breeding sites mid-Feb; arrival Switzerland

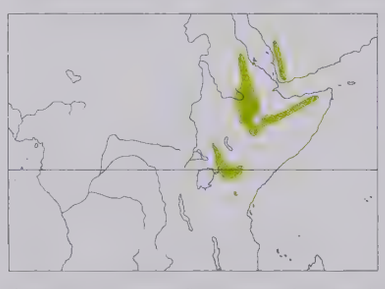
mid-Apr. Asian birds leave breeding areas Aug, passage in Kazakhstan and Tadjikistan lasting to end Sept, apparently moving into Africa on broad NE–SW axis across Red Sea (some perhaps making direct crossing over NW Indian Ocean, vagrants recorded in Seychelles), with peak passage early Oct; scarce autumn migrant in Bahrain, late Aug to mid-Nov, and rare in UAE, Sept–Nov; rare to scarce in Israel, mainly second half Sept. Marked passage late Aug and Sept in Cyprus, and mid-Sept to mid-Oct in Oman, but records in Egypt sparse and spread from late Aug to mid-Nov; immigration into E Africa starts mid-Sept and passage strongest late Oct; present in Tanzania Nov–Mar, with evidence of continued passage across Kenya–Tanzania border to at least mid-Dec. Winter site-fidelity may be high; one marked individual returned to same spot for three successive years, Serengeti. Emigration starts early Mar, continuing E Africa through Apr, when also main period in NE Africa (mainly first half Apr, Egypt); Israel mainly end Mar and Apr, and Bahrain Mar and Apr in small numbers, whereas in UAE and Oman marked passage from late Feb or early Mar to middle or late Apr, suggesting that earliest emigrants from Africa are those making longest journey to breeding grounds in Mongolia and China. Highest-lying areas in Turkey and Uzbekistan not reoccupied until early May. Vagrants recorded N to N & NW Europe, S to Zambia and E to Japan.
Status and Conservation. Not globally threatened. Total population in Europe in mid-1990s estimated at 32,362–44,924 pairs (highest numbers in Greece and Italy), with additional 5000–50,000 pairs in Turkey; at that time Spain estimated to hold 3500–4800 pairs, although more recently a minimum 2652 pairs has been calculated. By 2000, total European population (including Turkey) revised to 100,000–320,000 pairs and considered generally stable. Strong decline in Europe 1900–1960s, leading to loss of all German and most Austrian range (recently returned to Bavaria, in S Germany), and slight decline in most of European range during 1970–1990, possibly owing to habitat loss in both summer and winter quarters through afforestation and tourism development, possibly also succession following pastoral abandonment in Europe; proportion of upland pasture (i.e. overgrazed, barren hill country) in Franconia fell from 20% in 1850 to 1% in 1995; European populations require maintenance of extensive montane areas with low vegetation cover and appropriate non-intensive land use. Uncommon in Armenia and Afghanistan; scarce in Morocco; breeding population in extreme N Israel 7–12 pairs. Fairly common in Mongolia and N China. Densities throughout range relatively low, at least in part because habitat is often discontinuous, but breeding pairs can be only 200–800 m apart. In non-breeding quarters, common above 700 m in Sahel E of 19° E (Chad); uncommon in Sudan, frequent to common, mainly above 1200 m, in Ethiopia; frequent in Uganda and NE DRCongo, and common or locally common in Kenya. Much rarer W of Chad, where sparse or uncommon at best.
Bibliography. Adamian & Klem (1997, 1999), Ali & Ripley (1987b), Andrews (1995), Anon. (2004e), Ash (1980), Aspinwall (1977a), Backhurst (1987), Bannerman (1953), Barlow *et al.* (1997), Bates (1936), Bauer *et al.* (2003), Baumgart *et al.* (1995), Beaman & Madge (1998), Benson (1946a), Beven & England (1969), Borrow & Demey (2001), Britton (1980), Bundy (1976), Bundy *et al.* (1989), Butler (1905, 1908), Cave & MacDonald (1955), Chapin (1953), Cheesman & Sclater (1935), Cheng Tsohsin (1987), Colston & Curry-Lindahl (1986), Cornwallis & Porter (1982), Cramp (1988), Dementiev *et al.* (1968), Domínguez (2003), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Farkas (1955), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Gatter (1997), Glutz von Blotzheim & Bauer (1988), Gore (1990), Grimes (1987), Grimmett *et al.* (1998), Guichard (1955, 1957), Hagemeijer & Blair (1997), Hirschfeld (1995), Hogg *et al.* (1984), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Jensen & Kirkeby (1980, 1987), Kasparek (1992), Kirwan (2001), Kneis (1985a), Koffan & Farkas (1956), Ledant *et al.* (1981), Lewis & Pomeroy (1989), MacKinnon & Phillipps (2000), Mauersberger (1980), Meinertzhagen (1951), Meyer de Schauensee (1984), Moreau, R.E. (1961), Moreau, W.M. (1943), Morel (1985), Morel & Morel (1990), Morel *et al.* (1983), Neff (1992), Newby (1980), Newby *et al.* (1987), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Paz (1987), Pfeifer (1995), Piechocki *et al.* (1982), Porter *et al.* (1996), Rasmussen & Anderton (2005), Richardson (1990), Roberts (1992), Roselaar (1995), Sánchez (1994), Saporetti (1981), Schmidl (1982), Schmidt & Farkas (1974), Sclater & Mackworth-Praed (1918), Sharland & Wilkinson (1981), Shirihai (1996), Sinclair (1978), Sinclair & Ryan (2003), Skerrett *et al.* (2001), Smith, K.D. (1960), Smith, V.W. (1966), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Urban *et al.* (1997), Vaurie (1955b, 1972), Walker (1981), Welch & Welch (1984), Wilkinson & Beecroft (1985), Zimmerman *et al.* (1996).

187. Little Rock-thrush

Monticola rufocinereus

French: Monticole rougequeue **German**: Schluchtenrötel **Spanish**: Roquero Chico

Taxonomy. *Saxicola rufocinerea* Rüppell, 1837, Simen Province, northern Ethiopia.
Two subspecies recognized.
Subspecies and Distribution.
M. r. rufocinereus (Rüppell, 1837) – Eritrea, Ethiopia, N Somalia, E Uganda, Kenya and NE Tanzania.
M. r. sclateri Hartert, 1917 – SW Arabian Peninsula.



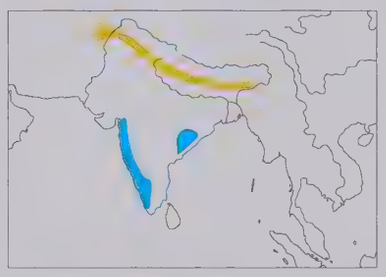
Descriptive notes. 15–16 cm; 20–27 g. Male nominate race is brownish blue-grey above, darker grey on wings, slaty blue-grey on face to mid-breast, with clean break to dull orange from lower breast to undertail, rump and outer tail; blackish central tail and tips. Female is somewhat paler, notably on face to mid-breast, with whitish chin. Juvenile is brown with pale buff spotting above, darker wings with two spotted wingbars, pale grey with brownish scalloping below, rump and tail as female. Race *sclateri* tends to show more brown on outer tail, female generally darker on face and breast. Voice. Song, from top of small tree, a series of simple, sweet, scratchy, fluty phrases of varying pitch, "tryyh-rrr-tvi-rirp-tschak-tschak", each phrase ending with double "zi-zit". Soft warbling subsong outside breeding season. Calls include soft "tyyt" or "trrt" in alarm.
Habitat. In N of range, upland scrub such as juniper and euphorbia stands, open low copses and thickets, light woodland on steep rocky slopes, and open slopes with scattered trees near forest edge; in S (Uganda, Kenya), wooded ravines with or without rocks, forest clearings, old kraals with scrub and nettles, cultivation with scattered trees, isolated thickets in open bushland or grassland, open grassy bush-free escarpments. To at least 1400 m.
Food and Feeding. Insects, such as grasshoppers, beetles and caterpillars; also fruits of *Rosa abyssinica* and *Olea chrysophylla*. Apparently uses trees from which to scan ground, dropping on to prey; also sallies after flying insects. Crepuscular.
Breeding. Apr–May in Somalia; probably Feb–Mar, May and Sept–Oct in Ethiopia and Eritrea; Mar, Jun and Dec in Kenya; Feb–Aug in Arabian Peninsula. One nest was 1·25 m up in cleft in trunk of tamarind (*Tamarindus indica*) at 1200 m, but said to nest in buildings at Nanyuki, in Kenya; in Arabian Peninsula nest made of twigs, bark strips, grass, moss and lichen, lined with finer grass, hair and feathers, placed on rock face, in tree with large, relatively light and open hole, or in building. Eggs 3–4, turquoise-blue, plain or with light reddish-brown freckles. No other information.
Movements. Sedentary; perhaps also a partial migrant, since reported only in Nov–Mar in extreme S Sudan, and in Yemen a partial vertical migrant, shifting from lower summer limit of 800 m to 600 m or lower in winter.
Status and Conservation. Not globally threatened. Frequent to common in Ethiopia, and very common in Eritrea; locally common in Somalia; no recent records in S Sudan. Uncommon and local in E Africa, but present in Kidepo Valley National Park, in Uganda, Hell's Gate and Lake Nakuru National Parks, in Kenya, and N Serengeti National Park, in Tanzania.
Bibliography. Archer & Godman (1937–1961), Ash & Miskell (1998), Benson (1946a), Betts (1966), Britton (1980), Brooks *et al.* (1987), Brooks (1987), Castell *et al.* (2001), Cave & MacDonald (1955), Cheesman (1935), Clement & Hathway (2000), Cornwallis & Porter (1982), Hollom *et al.* (1988), Jackson & Sclater (1938), Jennings (1995), Lewis & Pomeroy (1989), Nikolaus (1987), Phillips (1982), Porter *et al.* (1996), Sinclair & Ryan (2003), Smith (1957), Stevenson & Fanshawe (2002), Urban *et al.* (1997), Zimmerman *et al.* (1996).

188. Blue-capped Rock-thrush

Monticola cinclorhynchus

French: Monticole à croupion roux **German**: Himalajarötel **Spanish**: Roquero Capiazul
Other common names: Blue-headed Rock Thrush

Taxonomy. *Petrocincla cinclorhyncha* Vigors, 1832, Simla, Himalayas, India.
Previously considered conspecific with *M. gularis*. Monotypic.
Distribution. E Afghanistan, and W & C Himalayas E to W Arunachal Pradesh; non-breeding S India.



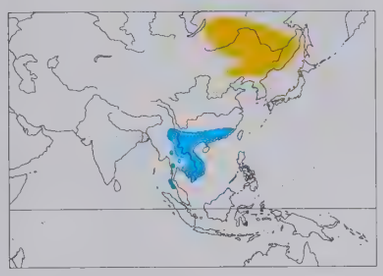
Descriptive notes. 16–19 cm; 29–41 g. Male has bright mid-blue crown and throat divided by black patch from lores through ear-coverts, black mantle and blue-fringed wings, with mid-blue lesser coverts and white bases of secondaries (white wingbar in flight); underparts rusty-orange, continuing onto lower back and rump; tail blue-tinged black; non-breeding plumage similar, but with brown fringes above, whitish fringes below. Like *M. gularis*, but legs dark in all plumages. Female is grey-brown above, whitish with heavy grey-brown scaling below, indistinct broad whitish mesial stripe on throat. Juvenile is very like female but with whitish spotting on upperparts, although white wing patch present on young male. Voice. Song, by male from open treetop, occasionally in display-flight, recalls that of *Saxicola torquatus* but is much richer, more deliberate, more mournful, alternating slurred mellow and burry notes, phrases rising and falling, "rit-prilee-prileer" or more extended "tew-li-di tew-li-di tew-li-di", sometimes with harsher "tra-trree-treea-tra" etc.; more varied and drier than songs of most congeners. Calls include short sweet rich "fi-ya", sharp rising "peri-peri" and grating nasal clucking, "goink-goink" or "tri-goink", in alarm. Silent in winter quarters.
Habitat. Breeds in open dry oak and pine forest (notably with dense undergrowth), including stands of *Pinus roxburghii*, *P. wallichiana* and *Cedrus deodara*, glades, open dry rocky grass-covered slopes with scattered trees, including heavily disturbed areas, at 900–2000 m (locally to 3000 m). Winters in broken country and secondary jungle, light evergreen, moist-deciduous or bamboo forest in lowlands and low hills, favouring cardamom and coffee plantations and field edges in S India; 610–2380 m.
Food and Feeding. Insects, snails, worms, small lizards and frogs, berries, seeds. One pair seen to bring skinks (*Scincella himalayana*) to nestlings; another brought caterpillars. Forages by scanning from tree perch and dropping to ground; also seeks food in trees (and is largely arboreal), searching on trunks and branches. On ground, turns over leaf litter with bill; occasionally sallies after flying insects. In winter, sometimes in small flocks and will also join mixed-species foraging flocks.
Breeding. Apr–Aug, mainly May–Jun, throughout range; probably double-brooded (recently fledged young seen end Aug), but no firm evidence. Nest a loose cup of moss, stems and leaves, decorated outside with flakes of bark, lined with fur, horsehair and/or pine needles, placed on or near ground, sometimes under exposed roots of tree, in hole in steep bank or rock crevice. Eggs 3–4, pinkish-white to creamy-white with reddish-brown stippling. No other information.
Movements. Migratory; present Apr–Oct in breeding areas. Non-breeding range in S India, mainly in Western Ghats and N Eastern Ghats; reports from SW Myanmar erroneous. Slightly circular pattern to winter movements, with more autumn records in W of wintering range and more spring records in E, but much overlap.
Status and Conservation. Not globally threatened. Very common in N Pakistan, and common generally in Himalayas.
Bibliography. Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Cheng Tsohsin (1987), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Paludan (1959), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Sugathan & Varghese (1996), Vaurie (1955b).

189. White-throated Rock-thrush

Monticola gularis

French: Monticole à gorge blanche **German**: Amurrötel **Spanish**: Roquero Gorgiblanco

Taxonomy. *Oroecetes gularis* Swinhoe, 1863, Peking, China.
Previously considered conspecific with *M. cinclorhynchus*. Monotypic.
Distribution. SE Russia (E from L Baikal) S to NE China and N Korea; non-breeding SE Asia and SE China.
Descriptive notes. 16–19 cm; 32–37 g. Male like male *M. cinclorhynchus*, but mid-chin and centre of throat white, rest of underparts richer chestnut-orange, shading paler towards vent, smaller white wing patch, legs pinkish; non-breeding male lacks greyish-brown fringes on upperparts. Female is like female *M. cinclorhynchus*, but mantle, back and median wing-coverts scalloped black, with darker ear-coverts, pale post-auricular patch and submoustachial stripe, whitish chin and mid-throat,



pinkish legs. Juvenile is like female but more heavily marked. VOICE. Song a series of melancholy, flute-like, drawn-out rising whistles, interspersed with more complex phrases and short "chat-at-at". Calls include thin "tsip" in flight, also soft "queck-queck" and sharp "tack-tack". **Habitat**. Breeds in open mixed montane forest, including pure larch and occasional spruce, alder, birch and rhododendron, light oak–spruce, spruce–larch and larch–pine tracts with undergrowth of rhododendron and *Lespedeza*, thickets of spruce, birch, oak, *Thuja*, wild rose and *Spiraea*, and rocky scrub in steep-sloping terrain near streams in valleys; above 1500 m in China, above 900 m in Korea, 300–1650 m in Russia but 200–500 m in Amurland. Winters in open evergreen forest, woods, edge and second growth, from plains to 1200 m.

Food and Feeding. Invertebrates taken all year. Stomachs from China held insects, mainly beetles (including weevils), mole-crickets and lepidopterans, and a few spiders; two stomachs of autumn migrants contained wasp larvae. Forages on ground or in small trees.

Breeding. May–Jul; two broods. Nest a bulky cup of dry leaves, twigs, lichen, moss and rootlets, with outer layer of pine needles and stems, placed on steep-sloping ground, in hollow amid roots, in fallen tree or stump, or in rock cavity. Eggs 4–8 (commonly 6), pinkish or whitish-yellow with rusty-brown spotting. Brood-parasitized by Common Cuckoo (*Cuculus canorus*). No other information.

Movements. Migratory; present on breeding grounds May–Sept, wintering mainly in S China, also from E Myanmar S to Indochina. Probably erratic winter visitor, typically in small numbers, in Myanmar; uncommon in winter in Thailand, common locally in Cambodia (at 1000 m). Leaves breeding grounds mid-Sept to start Oct. At Beidaihe (NE China) largely a spring migrant, with sparse records in Sept and Oct; this and paucity of passage records from Korea indicate that breeders migrate SW, rather than along coastal areas; reaches Fujian and Guangdong late Oct. Rare winter straggler in Peninsular Malaysia and Hong Kong, latter area with records between mid-Nov and end Mar. Return migration seen in SE Vietnam early Mar, in Fujian and lower R Yangtze early May; arrival in Russia and most breeding areas middle to late May, some not until early Jun. Vagrant to Japan.

Status and Conservation. Not globally threatened. Fairly common breeder in China, rare in N Korea.

Bibliography. Austin (1948), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1964), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Glenister (1971), Gore & Won Pyongoh (1971), Jeyarajasingam & Pearson (1999), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Medway & Wells (1976), Meyer de Schauensee (1984), Mohr (1994), Neufeldt & Vietinghoff-Scheel (1987), Robson (2000), Smythies (1986), Sowerby (1943), Tomek (2002), Wildash (1968), Williams (2000).



PLATE 68

inches 4

cm 10

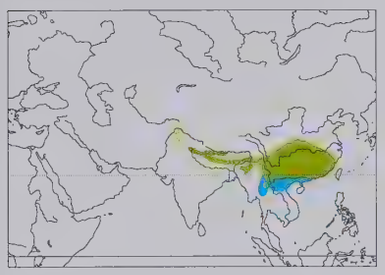
190. Chestnut-bellied Rock-thrush

Monticola rufiventris

French: Monticole à ventre marron **German**: Rötelmerle **Spanish**: Roquero Ventrirrufo
Other common names: Chestnut-breasted Rock-thrush

Taxonomy. *Petrocincla rufiventris* Jardine and Selby, 1833, Simla, Himalayas, India.
Monotypic.

Distribution. Pakistan E in Himalayas to NE India (S to Assam), Myanmar, SW & SE China, NW Thailand (Doi Inthanon) and N Indochina.



Descriptive notes. 21–23 cm; 48–61 g. Male has grey-blue crown and upperparts, with blackish lores and ear-coverts continuing onto shoulders and merging with deep bluish-black throat, sharply divided from deep chestnut underside; in non-breeding plumage, mantle and scapulars show whitish scaling, whitish wingbar. Female is dull grey-brown above, scalloped slate-grey and buffy-white below, with whitish-buff eyering, mesial stripe and prominent post-auricular patch. Juvenile is like female, but spotted and barred buffish above, wings edged buffish. Voice. Song, by male from top of tall tree or (when often more continuous) in short flight between trees, reminiscent of *M. cinclorhynchus* song but thinner and more subdued yet more varied, a series of sweet, short, sibilant but subdued undulating warbles, starting hesitantly with some level notes and becoming a rapid tinkling flurry, sometimes with last note slightly offset, "teetatewleedee-tweet tew" or "twew-twi-er tre-twi teedle-desh", lasting only 1·5 seconds and repeated at intervals; also includes piercing, slightly downslurred "police-whistle" note followed by quick upslurred "fweeeur-fweet!" Subsong reminiscent of quiet version of *Sturnus* starling song, a sustained bubbling and warbling interspersed with wheezy notes, babbling calls and grating notes. Calls include deep, loud, rattling squirrel-like "chhrrr" in alarm, a strange downslurred, twangy buzzing, a dry twitter, a sharp querulous "quach" and thin shrill "tick".

Habitat. Breeds in open moist coniferous (*Abies–Juniperus*) forest and oak (*Quercus*), tanbark (*Lithocarpus*) and rhododendron forest amid steep cliffs, boulders and streambeds, forest edges with clumps of bushes, banks and cliffs, at 1800–3400 m in Himalayas, 1200–2440 m in SE Asia. Winters on steep rocky hillsides with open fir–pine–cedar (deodar) stands, often in heavily degraded open areas and pastures, in foothills and duars below 2400 m in Himalayas; in evergreen forest edge, scrub country and rocky outcrops above 1200 m in Thailand.

Food and Feeding. Mainly insects, such as craneflies, and including large ones such as cicadas (which are battered on branch before swallowing); also molluscs and small lizards, sometimes berries. Forages mainly on ground, but often perches high in bare trees, and makes occasional aerial sallies.

Breeding. Mar–Jul in Himalayas, Apr in Myanmar and Apr–May in SE China; apparently single-brooded. Nest a cup of moss, leaves, grass and twigs, lined with roots and fine grass, placed deep in rock crevice or hollow in bank (often in hill road cutting) or amid tree roots, in inaccessible terrain. Eggs 3–6, glossy pale pinkish creamy-white with reddish-brown speckles. No other information.

Movements. Largely sedentary, but subject to limited vertical movements. Summer breeding visitor to Swat and Murree Hills, in N Pakistan; very scarce winter visitor to SE China in Hong Kong area, and uncommon non-breeding visitor Thailand and Indochina.

Status and Conservation. Not globally threatened. Fairly common to common, e.g. in China. Locally frequent within narrow range in N Pakistan. Widely distributed in higher hills in Myanmar; uncommon in Thailand (resident on Doi Inthanon).

Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Herklots (1967), Inskipp & Inskipp (1991), Jones (1947), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Vaurie (1955b, 1972).

191. Blue Rock-thrush

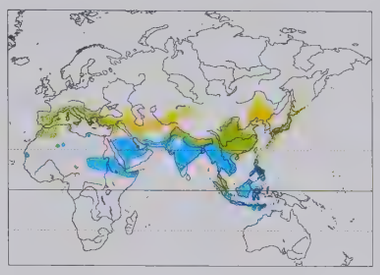
Monticola solitarius

French: Monticole merle-bleu **German**: Blaumerle **Spanish**: Roquero Solitario
Other common names: Red-bellied Rock-thrush (*philippensis*)

Taxonomy. [*Turdus*] *solitarius* Linnaeus, 1758, Italy.
Separation of races generally difficult; characters tend to intergrade, suggesting that most, if not all, variation is clinal. Race *philippensis* highly distinctive in plumage and to some extent apparently also in ecology, but intergradation extensive. Five subspecies recognized.

Subspecies and Distribution.
M. s. solitarius (Linnaeus, 1758) – NW Africa, S Europe (E to Italy and N Balkans), N Turkey and Transcaucasia; non-breeding also N Africa and Arabia.
M. s. longirostris (Blyth, 1847) – Greece, W & S Turkey and Levant to Tien Shan and NW Himalayas; non-breeding also NE Africa E to N India.
M. s. pandoo (Sykes, 1832) – C Himalayas, C & E China (including Hainan) and N Vietnam; non-breeding S & SE Asia S to Greater Sundas.
M. s. philippensis (Statius Muller, 1776) – E Mongolia, NE China, Korea, S Sakhalin, S Kuril Is, Japan, Ryukyu Is, and N Philippines (Batanes Is); non-breeding SE China and Philippines S to Sundas.
M. s. madoci Chasen, 1940 – extreme S Thailand, Peninsular Malaysia and N Sumatra.

Descriptive notes. 20–23 cm; 37–70 g. Male nominate race is deep blue, darker and browner on wings and tail. Female variable, usually much duller above, generally blue-grey, often brownish; below streaked buff and brown from lower face to mid-breast, shifting to buff-and-brown barring from lower breast to undertail. Juvenile is dark brown with no blue tone, and more strongly spotted and scaled than female. Race *longirostris* is on average smaller, male duller, paler and greyer



and often with very narrow vague buff barring, female paler and less crisply marked; *pandoo* is very similar to previous, but on average smaller and darker, male bluer, female with more distinct underpart pattern; *philippensis* male is stronger blue above, with dull chestnut mid-breast to undertail, often with indistinct narrow buff-and-black barring over body, female darkest; *madoci* is smallest, female more richly suffused blue than other races. Voice. Song (by both sexes, chiefly by male) melodious and rich, a short series of individually varied phrases lasting 1·3–2·3 seconds with at least 0·5-second pause, each phrase a warble of 5–8 sweet clear slurred whistles, short churrs and rolling trills, "tju-sri tjurr-titi wuchi-trr-trrt-tri", sometimes with mimicked songs of other birds; more varied than songs of most congeners, recalling that of *Turdus merula* but simpler and more repetitive; delivered from perch (including rooftops and television aerials) but also in flight, then louder and longer-phrased; sings Jan to mid-May and again Aug–Nov (Malta), sometimes on wintering grounds (e.g. Dec–Feb in Eritrea, Sept in Myanmar). Subsong also heard in summer and winter, a pleasant quiet warbling recalling song of Common Starling (*Sturnus vulgaris*), reported as main song in Japan. Calls include deep "tak-tak" for contact-alarm, very high "piii" in warning, these two combined as "katchuc-tchuc" or "pii-chuc-chuc" in higher alarm; soft, liquid but penetrating "uit-uit" a low-intensity version of warning call.

Habitat. Breeds on precipitous cliffs, in steep rocky valleys and defiles, ravines and gorges, on crags, outcrops, arid boulder-strewn slopes, sea cliffs and headlands, rocky coasts, ruins, quarries and open mines, isolated stone buildings, churches in rural valleys; in parts of S Europe where *Turdus merula* absent frequents roofs of houses, churches, castles and monuments, and occasionally invades urban environments (e.g. Rome), in Europe up to 1000 m but reaching over 2000 m in S mountains; key habitat features appear to be vertical faces (cliffs, buildings) and diverse vegetation over 20–80% of area. In Morocco breeds on sea cliffs and at 2000–2700 m, wintering lower in valleys, plains, towns, olive groves and gardens. In Israel breeds at 300–1700 m, in Turkey at 0–2500 m, generally below elevations for *M. saxatilis*. In Afghanistan and Himalayas, breeds on barren boulder-strewn hillsides, gorges, rocky scarps and dry scrubby patches at 1200–4200 m, wintering through foothills, duars and plains in broken rocky country, cliffs, ravines, ancient forts, buildings, villages and quarries. In SE Asia 0–1830 m, often breeding along coasts, and in Peninsular Malaysia *madoci* associated with limestone outcrops (recently also city buildings); *philippensis* apparently more coastal than other races, and in Japan exclusively coastal lowlands, on rocky beaches, slopes and cliffs, along lower riverbanks, in villages and on concrete city buildings up to 10 km from sea. On passage catholic in use of habitat, occurring in oases, coastal desert wadis and at dams and barrages. In winter in Europe, may occupy habitats rarely used for breeding, such as olive orchards; in Africa, mountain tops and plateaux with vertical rock faces and some woody vegetation, inselbergs in rainforest and savanna zones, quarries, mine tailings (Liberia), rocky coasts (NW Africa, Senegal, Eritrea) and buildings. In winter in Asia, habitat again catholic but normally requires some bare rock: in Myanmar compounds of forest resthouses, rocky hilltops in open country, boulders around watercourses, roadsides with stone culverts, and in Cambodia also around temples; in Philippines in similar areas and along rocky streams and rivers, also selectively logged and degraded lowland forest; in N Sumatra found repeatedly in pine forest, 800–1000 m; in Borneo in urban and suburban areas, using gardens and buildings, often along shoreline among rocks and tree stumps; in Hong Kong prefers rocky coastal areas, but penetrates even heart of urban areas, using buildings in place of cliffs; on Buru (S Moluccas), found along rocky shorelines and on small rocky islets.

Food and Feeding. Invertebrates, small vertebrates, and fruit. Mainly insects, including grasshoppers, locusts, crickets, mole-crickets, adult and larval lepidopterans, beetles, ants and flies; also spiders, snails, earthworms. Vertebrate food includes small lizards (*Acanthodactylus*, *Psammodromus*, *Tarentola*, *Podarcis*), snakes (including *Natrix natrix*), frogs, toads and even mice. Fruits, berries and seeds, taken mainly in autumn and winter, include fig (*Ficus*), hawthorn (*Crataegus*), ivy (*Hedera*), olive (*Olea*), vine (*Vitis*), daphne (*Daphne*), joint pine (*Ephedra*), *Viburnum*, *Myrtus*, and umbellifers. Three stomachs in Armenia held beetles, larvae, molluscs and seeds; in China, stomachs contained mainly insects, including beetles and their larvae, mole-crickets and lepidopterans, but also spiders, often in considerable numbers. Caterpillars and lizards frequently fed to nestlings; food brought to nest in Jun was, by weight, 63% reptiles, 14% orthopterans, 15% other insects and 8% worms. In winter, Borneo, worms, insect larvae, snails, crustaceans, a whole gecko, and berries. Forages by scanning from low vantage and dropping to ground to take prey, also by hopping and running on ground; occasionally flycatches in aerial sallies of 7–30 m (this habit apparently much more pronounced in distinctive race *philippensis*). Takes fruit direct from plant and on ground.

Breeding. Mar–Jul in NW Africa, end Apr to mid-Jul in Iberia and end Feb to mid-Jun in Israel; Jun–Jul in Afghanistan, Apr–Jul in Himalayas and May–Jul in China; at least Apr–May in Japan; Jan–May in Peninsular Malaysia, to Jul in SE Asia as whole; Apr–Jun in N Philippines; double-brooded, exceptionally triple-brooded. Territory size not particularly large: in one case 2·5 ha, in another only 1 ha (but latter also contained 0·5 ha of vertical rock). Nest a shallow cup or rough pad of coarse dry grass, rootlets, moss and leaves, loosely constructed and lined with fine soft grass, rootlets and occasional feathers and plant down, placed under rock overhang, in crevice of cliff, rock, bank, cave or building, sometimes tree hole, generally 2–5 m above ground but once 120 m up on precipice; nest may be used in successive years. Eggs 3–6 (3 in Peninsular Malaysia), pale blue to turquoise, plain or with pale reddish-brown freckling and mottling; incubation period 12–15 days; nestling period 15–18 days; post-fledging dependence c. 2 weeks.

Movements. Sedentary, partial migrant, altitudinal migrant and intercontinental migrant; nocturnal migrant, solitary or in small loose groups, sometimes with *M. saxatilis*. Sedentary and partial migrant in Europe and NW Africa; most individuals probably dispersive over short distances, males staying closer to breeding sites than females. Timing and pattern of movements unclear owing to widespread residency, but main arrivals in N Africa and Saharan massifs Sept, and main passage in Chad late Sept to early Oct; winters in Hoggar Mts (Algeria) and Tibesti highlands (Chad), then continuously from E Chad E to N Ethiopia, Eritrea and N Somalia. Origin of W African wintering populations unknown, but probably S Europe rather than N Africa. Sedentary and altitudinal migrant in Morocco, where upland birds partly or completely leave areas above 2000 m, and some

On following pages: 192. Mocking Cliff-chat (*Thamnolaea cinnamomeiventris*); 193. White-winged Cliff-chat (*Thamnolaea semirufa*); 194. Congo Moor-chat (*Myrmecocichla tholloni*); 195. Northern Anteater-chat (*Myrmecocichla aethiops*); 196. Southern Anteater-chat (*Myrmecocichla formicivora*); 197. Sooty Chat (*Myrmecocichla nigra*); 198. Rüppell's Black-chat (*Myrmecocichla melaena*); 199. White-fronted Black-chat (*Pentholaea albifrons*); 200. White-headed Black-chat (*Pentholaea arnotti*).

evidence of minor autumn (Sept–Nov) and spring (Feb–Apr) passage perhaps involving European birds; similar situation in Israel, mainly Oct and Mar, residents (mostly females) dispersing to low-lying areas in Sept–Apr. Vertical, partial and intercontinental migrant from C Turkey E to Kirghizstan. Asian migrants winter in NE Africa, Arabia, Indian Subcontinent, SE Asia and archipelagos of Philippines and Indonesia. Limited post-breeding dispersal commences Aug in Turkey, but E Caucasus not left until mid-Sept and some stay into Oct. Scarce autumn migrant in Bahrain Sept–Nov, but widespread in spring, mainly late Feb to mid-Mar; similar pattern in Egypt, where fairly common in Oct–Nov but considerable numbers in second half Mar; in contrast, numbers in E Saudi Arabia in autumn (Sept) probably double those in spring (Mar). Non-breeding grounds in Sudan, Eritrea and Somalia occupied from early Oct, with spring emigration from mid-Feb, peak passage through Middle East late Mar to Apr, and reoccupation of breeding grounds in Turkey and Transcaucasia Apr–May. Resident and/or full migrant in China and Japan; sedentary in Japan S from C Honshu; S Korea populations non-migratory (or move short distances to coastlines and islands), while those in SE Russia, NE China and N Korea move S in winter. At Beidaihe, in NE China, may be commoner in spring than in autumn; main autumn passage there late Aug to mid-Oct. Uncommon migrant in Hong Kong, generally from mid-Sept to end Apr, peak arrival first week Oct; most wintering in urban areas of Hong Kong are immatures. Present late Sept to late Apr in Myanmar; last 10 days Sept to mid-May in Philippines. Uncommon passage migrant and winter visitor in Borneo (including N Natunas), Sept–Apr; uncommon in winter N Sumatra, with dates late Jan to early Apr. Regular in Wallacea early Sept to early May; recorded on Buru (Moluccas) Oct–Mar. Straggler to Sri Lanka, Andamans and Nicobars. Infrequent winter visitor to Palau. Vagrant in New Guinea and Australia.

Status and Conservation. Not globally threatened. Total population in Europe in mid-1990s estimated at 40,675–61,602 pairs, with additional 5000–50,000 pairs in Turkey. By 2000 total European population (including Turkey) revised to 120,000–260,000 pairs and considered generally stable. Majority of European population divided equally between Spain (12,500–16,800 pairs, more recently calculated at minimum 10,093) and Italy, but significant declines in both countries during 1970–1990, partly as a result of new coastal tourist development, flooding of canyons and gorges for reservoirs, renovation of old towers and churches, and afforestation and regrowth of matorral following pastoral abandonment (but declines in parts of Spain cannot be explained by any of these factors). Density of at least 15 males in 5 km² in Sicily. Persecution on Malta has driven birds to occupy inaccessible coastal areas. Locally common in Morocco; scarce inTunisia, where slight decline in SE; fairly common in Israel, with total population estimated at few thousand pairs; locally common in W & S Turkey; common in Armenia. Common in N Pakistan, fairly common in rest of S Asia. Common in China; common in Japan S from C Honshu, uncommon to N; breeds in sparse numbers in N Korea, but common on coast and in C mountains in S Korea. Locally common around L Toba, in N Sumatra.

Bibliography. Adamian & Klem (1997, 1999), Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Andrews (1995), Anon. (2000a, 2004e), Ash (1980), Austin (1948), Austin & Kuroda (1953), Baker (1951), Bannerman (1953), Barlow *et al.* (1997), Bates (1934, 1936), Bates & Lowther (1952), Baumgart *et al.* (1995), Beaman & Madge (1998), Benson (1946a), Beven (1968), Borrow & Demey (2001), Brazil (1991), Brooks (1987), Bundy (1976), Bundy *et al.* (1989), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cave & MacDonald (1955), Chasen & Hoogerwerf (1941), Cheng Tsohsin (1964, 1987), Coates & Bishop (1997), Colston & Curry-Lindahl (1986), Cornwallis & Porter (1982), Cramp (1988), Danielsen *et al.* (1994), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dharmakumarsinhji (1955), Dickinson *et al.* (1991), Duckworth, Davidson & Timmins (1999), Étchécopar & Hüe (1964), Evans & Dijkstra (1993), Field (1973), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Gatter (1997), Glenister (1971), Glutz von Blotzheim & Bauer (1988), Gore (1990), Gore & Won Pyongoh (1971), Grimes (1987), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Harrison (1999), Hellmich (1984, 1994), Henry (1998b), Herklots (1967), Hipkin (2003), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Isenmann (1986), Isenmann & Moali (2000), Jensen & Kirkeby (1980), Jeyarajasingam & Pearson (1999), Kasparek (1992), Kennedy *et al.* (2000), Ledant *et al.* (1981), Lee Woo-Shin *et al.* (2000), Legge (1983), Leithaus (1995), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Martens & Eck (1995), Medway & Wells (1976), Meyer de Schauensee (1984), Moreau & Moreau (1928), Morel (1985), Morel & Morel (1990), Morel *et al.* (1983), Newby *et al.* (1987), Niethammer (1963), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Paz (1987), Polak (1998), Porter *et al.* (1996), Pratt *et al.* (1987), Rasmussen & Anderton (2005), Richardson (1990), Roberts (1992), Robson (2000), Rodríguez de los Santos *et al.* (1987), Roselaar (1995), Rouchouse (1985), Rüter & Isenmann (1997, 2001), Salvati (1997), Sclater & Mackworth-Praed (1918), Sheldon *et al.* (2001), Shirihai (1996), Siebers (1930), Silsby (1980), Sinclair & Ryan (2003), Smith (1960), Smythies (1986, 1999), Sowerby (1943), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Tomek (2002), Tyler & Ormerod (1993), Urban *et al.* (1997), Vaurie (1955b, 1972), Walsh & Grimes (1981), Welch & Welch (1984), White & Bruce (1986), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

Genus *THAMNOLAEA* Cabanis, 1850

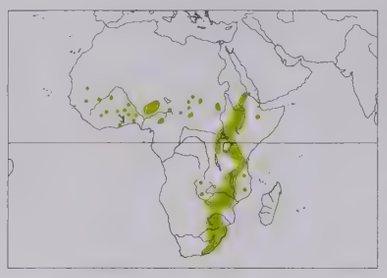
192. **Mocking Cliff-chat**

Thamnolaea cinnamomeiventris

French: Traquet à ventre roux **German**: Rotbauchschmätzer **Spanish**: Roquero Imitador
Other common names: White-crowned Cliff-chat (*coronata*)

Taxonomy. *Turdus cinnamomeiventris* Lafresnaye, 1836, Cape Province, South Africa.
Often placed in genus *Myrmecocichla*. Race *coronata* has been treated as a separate species (sometimes with race *kordofanensis*) but, despite reports of dark-crowned *cavernicola*-type birds in sympatry or close allopatry, this decision appears premature. Nine subspecies recognized.

Subspecies and Distribution.
T. c. bambarae Bates, 1928 – S Mauritania, E Senegal and SW Mali.
T. c. cavernicola Bates, 1933 – C Mali (Mopti).
T. c. coronata Reichenow, 1902 – N Ivory Coast and E Burkina Faso E, discontinuously, to W Sudan.
T. c. kordofanensis Wettstein, 1916 – Nuba Mts, in C Sudan.
T. c. albiscapulata (Rüppell, 1837) – N Eritrea and N, C & E Ethiopia.
T. c. subrufipennis Reichenow, 1887 – SE Sudan and SW Ethiopia S through Rift Valley and Tanzania to E Zambia and Malawi.
T. c. odica Clancey, 1962 – E Zimbabwe.
T. c. cinnamomeiventris (Lafresnaye, 1836) – E Botswana, E South Africa, W Swaziland and Lesotho.
T. c. autochthones Clancey, 1952 – S Mozambique S to NE South Africa and E Swaziland.



Descriptive notes. 19–21 cm; 41–51 g. Recalls *Cossypha* in appearance, but slimmer. Male nominate race has glossy black upper body, wings and tail, with white shoulder patch (median and lesser wing-coverts), clear-cut orange-rufous rump becoming darker on uppertail-coverts; below, black down to breast, thin white line across upper belly, pale orange-rufous belly shading darker on vent; bill and legs black. Female is like male, but black replaced by dark grey, rump and lower underparts dark rufous, latter less clear-cut, no white shoulder patch. Juvenile is like respective adult, but matt black and duller overall. Race *cavernicola* male is like nominate, but median coverts white without black tips, female has yellower underparts; *bambarae* resembles previous, but rump darker, uppertail-coverts blue-black and white shoulder patch smaller, female with less rufous on rump; *subrufipennis* is like nominate, but male has orange-rufous next to white belly-line paler, female paler grey on body (but not wings) and paler orange-rufous; *albiscapulata* is similar to last, but male uppertail-coverts glossy blue-black, sexes similar except that female lacks wing patch; *kordofanensis* is also similar, but crown white in male, female crown greyer, upperparts browner and chin to breast washed olive-rufous; *coronata* is like previous, but male crown fringed blackish, female underparts yellower; *odica* has belly and flanks tawny-chestnut; *autochthones* is like nominate but smaller, no white line on belly. Voice. Song (by both sexes) a fine, rich, powerful and far-carrying fluty warbling, of two types (possibly "song" and "subsong"): one type a slow, clear, strong, melodious fluting, without mimicry, "tsiiu tsiiu, wiik-wiik-wiik, chir-chir-chir, tseuk tseuk tsuchiiio, tsur wiio tsik"; other type a quieter, quicker, rambling through many imitations of other species (over 30 documented). For most of year singer is generally answered by its mate, and song may be delivered as duet; during non-breeding season duet somewhat disjointed. Calls include high penetrating "siiio", quicker "siiu-siiu", sibilant "ist-sisissi" and harsh "kraat" in alarm; "zerr" during courtship and nest-building.

Habitat. Requires mix of rocks and trees; thus occurs on cliffs, kopjes, inselbergs, gorges and boulder-strewn slopes where these sit in woodland and savanna, especially with fig trees (*Ficus*); only in Eritrea recorded among rocks with no woody vegetation. Sometimes uses houses, erosion gulleys, road culverts and bridges; often becomes tame around campsites. To 2130 m in Malawi, 2440 m in Zimbabwe; at 600–2200 m in E Africa, where mainly in higher-rainfall highlands and peripheral plateaux (absent from drier rocky areas).

Food and Feeding. Figs of several species, including *Ficus ingens*; insects, including flying ants; also spiders, as well as aloe nectar. Forages in trees and on ground. Uses tree as perch from which to drop down on to prey; one bird also observed searching among rocks and in tussocks, repeatedly near water.

Breeding. Nestlings in May and fledglings Jul in Ghana; Dec–May in Nigeria; Feb and Apr–Jun in Ethiopia; rainy season (Mar–Jun, Nov–Dec) in E Africa; breeding-condition bird Feb and breeding reported Jul in DRCongo; Nov in Zambia; Oct–Dec in Malawi; Sept–Dec in S Mozambique; mainly Sept–Jan, peak Oct–Dec in Zimbabwe and South Africa; up to three broods per season. Nest an untidy but compact structure of grass, leaves, twigs, rootlets, hair (e.g. of antelope or hyrax *Procavia*), down and feathers, lined with cobweb, soft fibres and hair, generally placed in appropriated mud nest (owners sometimes actively evicted) of Lesser Striped Swallow (*Cecropis abyssinica*) or, more rarely, Greater Striped Swallow (*C. cucullata*), or of swift (Apodidae), less often of Rock Martin (*Ptyonoprogne fuligula*), or else in crevice in rock or hole in wall; swallow nests used are often under bridges or on buildings, and nest entrance tunnels gradually disintegrate with use, or may be broken off deliberately and existing lining pulled out and replaced. Eggs 2–4, average of 36 clutches in S Africa 2·8 (but in DRCongo always 2), white, cream, pale green, greenish-blue or blue, with pale reddish-brown and mauve spots; incubation period 14–15 days; nestling period 19–21 (exceptionally 15–16) days; post-fledging dependence uncertain.

Movements. Resident. In some higher areas a vertical migrant; e.g. in South Africa, absent in some years from highveld in mid-May to mid-Sept, and similarly moves to lower altitudes in Drakensberg Mts in winter.

Status and Conservation. Not globally threatened. Locally common from Eritrea S to E South Africa; common in Malawi, abundant in Burundi, frequent in Ethiopia, local and uncommon to common in Sudan, although in E Africa local and rather uncommon but present in Serengeti, Lake Manyara and Tarangire National Parks and Mkomazi Game Reserve, in Tanzania. Much less common in W of range, being generally rare to fairly uncommon but always rather patchy; in Nigeria common on granitic hills N of R Niger, and in Senegal widespread near Kédougou. Absent from many apparently suitable areas of habitat within its range.

Bibliography. Bannerman (1953), Bates (1934), Beasley (1977), Benson (1940, 1946a), Benson & Benson (1977), Borrow & Demey (2001), Britton (1980), Cave & MacDonald (1955), Chapin (1953), Cheesman (1935), Cheesman & Sclater (1935), Cheke (1982), Cheke & Walsh (1996), Clancey (1962a, 1996), Day (1987), Elgood *et al.* (1994), Farkas (1961, 1966a), Green (1980), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Maclean (1993), Morel (1985), Morel & Morel (1990), Nikolaus (1987), Oatley & Skead (1972), Sharland & Wilkinson (1981), Sinclair (1984), Sinclair & Ryan (2003), Smith, K.D. (1957), Smith, V.W. *et al.* (1966), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Tarboton *et al.* (1987), Vincent (1935b), Wilkinson & Beecroft (1985), Wilson (1982), Zimmerman *et al.* (1996).

193. **White-winged Cliff-chat**

Thamnolaea semirufa

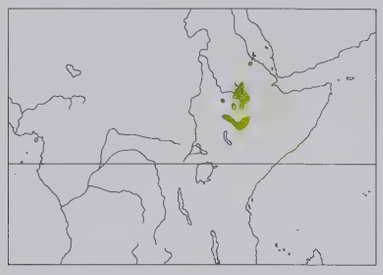
French: Traquet demi-roux **German**: Spiegelschmätzer **Spanish**: Roquero Abisinio

Taxonomy. *Saxicola semirufa* Rüppell, 1837, Lake Tana, Ethiopia.
Often placed in genus *Myrmecocichla*. Monotypic.

Distribution. Eritrea and Ethiopia.

Descriptive notes. 19–21 cm. Both sexes and all ages have white patch at base of primaries. Male is glossy black, with orange-russet abdomen; bill and legs black. Female is blackish above, brownish-black on wings, rump and tail, dark brown below with fine dull orange-buff barring, buff stripe down throat, dull orange vent. Juvenile is black with fine buffy-orange spotting. Voice. Undocumented. Reported as having a fluty modulated song.

Habitat. Requires mix of rocks and trees in landscape, thus on valley slopes bordering forest, scrubby gorges, wooded boulder-strewn ravines, degraded park-like *Podocarpus* forest with rocky outcrops, stony ground near cultivated land. Usually above 2100 m in Ethiopia, but 1550–1850 m in Yavello Hills and 1500–1800 m in hilly downland at Sidamo and Borana; 1250–2500 m in Eritrea.



Food and Feeding. Little information available. Fledglings once seen fed with emerging winged termites.
Breeding. Jun–Aug. Nest made of grass stems and moss, lined with feathers and hair, placed in rock crevice or hole in wall. Eggs 3, white or greenish-white with fine pale rufous speckling. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Locally frequent to common in Ethiopia, but uncommon in Sidamo and Borana; uncommon in Eritrea. Present in Bale Mountains, Mago, Simien Mountains, Yavello and Entoto National Parks. No evidence of any threat or decline.
Bibliography. Ash & Gullick (1989), Benson (1946a), Cheesman & Sclater (1935), Keith *et al.* (1992), Safford *et al.* (1993), Sinclair & Ryan (2003), Smith (1957), Urban (1978), Vivero (2001).

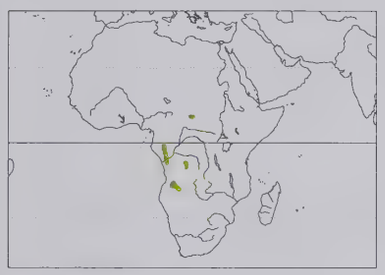
Genus *MYRMECOCICHLA* Cabanis, 1850

194. Congo Moor-chat

Myrmecocichla tholloni

French: Traquet du Congo **German**: Kongoschmätzer **Spanish**: Zorzal-hormiguero del Congo
Other common names: Thollon's Chat/Moor-chat

Taxonomy. *Saxicola Tholloni* Oustalet, 1886, Lékéti, on the Alima River, PRCongo.
Monotypic.
Distribution. Highly disjunct range: Central African Republic, SE Gabon, PRCongo, W DRCongo and N & C Angola.



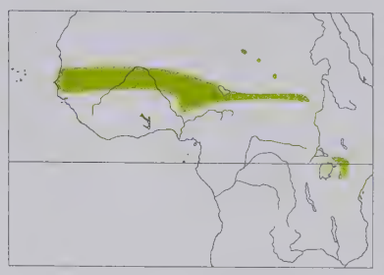
Descriptive notes. 18–19 cm. Short-tailed chat, with curious shivering or "flittering" flight on rounded wings. Plumage is brownish-grey above with dark brown mottling, dark brown wings with white bases of primaries, extensive white rump, dark brown tail; dark-stippled grey face with paler throat, dirty greyish breast with brown streaking, greyish-brown belly and flanks, whitish vent; black bill and legs. Sexes similar. Juvenile is darker on head and mantle, greyer below, with no white in wings. Voice. Song a series of slightly variable phrases consisting of short clear melodious whistles interspersed with rolled "chiurrr" calls. Alarm a shrill weak "piip", very like that of *M. aethiops*.
Habitat. Open grasslands on sandy or marshy ground, usually with scattered bushes or small trees, especially along roadsides; in PRCongo, open *Loudetia* grassland with few or no trees. Recorded at 730–1730 m in Angola.
Food and Feeding. Mainly insects, such as beetles and grasshoppers; small lizard found in one stomach. Forages mainly on ground, but often uses low perch in bush, tree or even telegraph wire to scan for prey; often in parties of 4–5.
Breeding. Young in Jul in DRCongo; breeding-condition birds Aug in Angola; evidently breeds at end of dry season. Nest very like that of *M. nigra*, in sandpit; brood of two young seen. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Considered locally fairly common in SE Gabon and PRCongo. Population of Central African Republic lies within Manovo-Gounda-Saint Floris National Park. Locally common in Angola. Density of up to 6 pairs/km² at Réserve de la Léfini, in PRCongo.
Bibliography. Borrow & Demey (2001), Carroll (1988), Chapin (1953), Dean (2000), Dowsett & Dowsett-Lemaire (1997), Hall (1960a), Keith *et al.* (1992), Lippens & Wille (1976), Lynes (1938), Sinclair & Ryan (2003).

195. Northern Anteater-chat

Myrmecocichla aethiops

French: Traquet brun **German**: Rußschmätzer **Spanish**: Zorzal-hormiguero Septentrional
Other common names: Ant Chat

Taxonomy. *Myrmecocichla aethiops* Cabanis, 1850, Senegal.
Has been suggested as possibly conspecific with *M. formicivora*. Three subspecies recognized.
Subspecies and Distribution.
M. a. aethiops Cabanis, 1850 – Senegal and Gambia E to Chad.
M. a. sudanensis Lynes, 1920 – WC & C Sudan.
M. a. cryptoleuca Sharpe, 1891 – W & C Kenya and N Tanzania.
Descriptive notes. 17–19 cm; 47–66 g. Plumage is blackish-brown throughout, with bases of flight-feathers extensively white (showing strongly in flight); bill and legs black. Sexes similar, female marginally paler. Juvenile is like adult, but throat and breast buff-edged. Race *sudanensis* is smaller and paler than nominate; *cryptoleuca* is longer-winged and darker. Voice. Song a rolling, musical, rather monotonous protracted mix of clear whistles and guttural chirps and rattles, recalling *Acrocephalus* warbler, "chwerchiwee tserk, chiwerchiwee, tsick-tuweee tuwee, teeruweeer tsick, tchu chiwer", sometimes accompanied by swaying and wing-drooping, sometimes delivered by several individuals simultaneously. Subsong apparently given by young male. Calls include sharp loud rasping "tsui" or "tsiio", high "pit" in alarm, and soft "brrt" by begging fledgling and sometimes by adult.
Habitat. Short-grass terrain, usually with bushes and almost always with termitaria, such as savannas in W & C of range, open acacia woodland and montane grassland in E; at 1500–3000 m, mainly above 1700 m in Kenya. Also farmland and near villages; uses termitaria and broken ground such as earth holes (aardvark dens), banks and quarries, including unlined wells, for nesting and roosting.



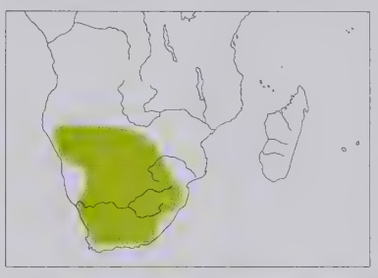
Food and Feeding. Mainly insects, such as moths, termites, beetles, ants, grasshoppers and caterpillars; also spiders, small vertebrates; occasionally fruits of *Withania somnifera*. Forages on ground; also from perch such as fence post, dropping to ground to take prey. Generally upright stance.
Breeding. Generally Jul–Sept in W Africa, but fledglings also in May in Nigeria; Jun–Aug in Sudan; mainly during early to middle rainy seasons in E Africa, but in all months in one region. Monogamous, with long-lasting pair-bond. Regularly co-operative breeder in Kenya. Nest a flat grass cup lined with fine rootlets, at end of horizontal tunnel 1·5 m long dug in termite mound, aardvark den or side of earth well or bank. Eggs 2–5, pure white; incubation period 14–16 days; nestling period 21–23 days. Parasitism by Greater Honeyguide (*Indicator indicator*) widespread. Annual adult mortality c. 30%.
Movements. Sedentary in Kenya. In Mauritania may move N in rains; in Gambia visits immediately after rains, but resident on N bank of R Gambia.
Status and Conservation. Not globally threatened. Fairly common. W & C races widespread but only locally common, e.g. in Sudan common up to 1700 m in Darfur and at 2440 m on Jebel Marra; large areas where unrecorded. E *cryptoleuca* fairly common within limited range.
Bibliography. Bannerman (1953), Barlow *et al.* (1997), Bates (1927, 1934), Beaman & Madge (1998), Betts (1966), Borrow & Demey (2001), Cave & MacDonald (1955), Cramp (1988), Duhart & Deschamps (1963), Elgood *et al.* (1994), Elliott & Fuggles-Couchman (1948), Gee (1984), Gore (1990), Haas (1986, 1988), Jensen & Kirkeby (1980), Keith *et al.* (1992), Lamarche (1988), Lewis & Pomeroy (1989), Mundy & Cook (1974), Nikolaus (1987), Sharland & Wilkinson (1981), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

196. Southern Anteater-chat

Myrmecocichla formicivora

French: Traquet fourmilier **Spanish**: Zorzal-hormiguero Meridional
German: Termitenschmätzer

Taxonomy. *Motacilla formicivora* Wilkes, 1817, near the Sondag and Swartkop Rivers, South Africa. Has been suggested as possibly conspecific with *M. aethiops*. Monotypic.
Distribution. Namibia E to SW Zimbabwe, S to South Africa, Swaziland and Lesotho.



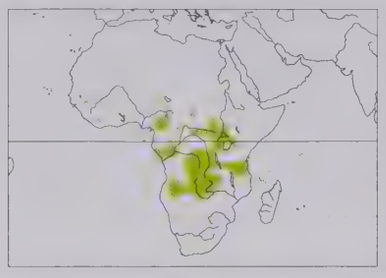
Descriptive notes. 17–18 cm; 35–51 g. Very like *M. aethiops*, but very dark greyish-brown to blackish with faint scaling or paler edges, and male with white (often hidden) shoulder patch. Juvenile is like adult, but with paler spotting. Voice. Song (by both sexes, female only when excited) a usually sustained series of phrases that are repeated 2–3 times, each consisting of mix of whistles and guttural chirps, "tii-a-u, uu-uu, tiiii-a-u", with quality recalling that of *Turdus merula*; occasional mimicry. Call a clear mournful "wiiiii".
Habitat. Open grassy country, especially in rolling hills, and semi-desert scrub, commonest in drier, sparsely bushed country with many termitaria; often by roadsides and on grassy pans. Sea-level to 1300 m or higher.
Food and Feeding. Mainly ants and termites. Near Bloemfontein, in South Africa, hymenopterans (almost exclusively ants) were numerically dominant in summer diet of 33 birds, although sunspiders (Solifugae) were largest proportion of diet by weight; in winter, hymenopterans and termites (entirely *Hodotermes*) numerically dominant, while termites and grasshoppers composed 77% of dry weight. Stomachs of five birds from throughout year in Free State (South Africa) held, by number, 48% seeds, 22% worker ants, 18% weevils, 8% other beetles and 4% solifugids. Bugs, lacewings, various beetles, caterpillars and millipedes also recorded; fruit taken in Feb–Apr. Forages on ground and from perches on termitaria, low shrubs, fence posts, wires. Catches prey by hopping or running over ground, but also by dropping from perch on to ground or into vegetation; has been seen to forage in loose soil excavated by aardvark or porcupine, and to take *Trinervitermes* termites from broken termitaria. Generally erect stance.
Breeding. Sept–Dec in Botswana, and Aug–Mar and Apr (peak Oct–Dec) in South Africa; two or three broods. Young of first brood help at nests of subsequent broods (but no helpers at first nests). Nest a cup of dry grass and rootlets, at end of tunnel 0·3–1·5 m long dug into sandy bank by stream or road, ditch, quarry, or side or roof of animal burrow (aardvark, hyena, porcupine, springhare, yellow mongoose or ground squirrel); excavation may take 8–10 days, longer if soil hard; burrow often used in successive seasons, although not for successive broods (but sometimes third clutch laid in same burrow as first); alternatively, uses hole in bridge or termite mound, or nest of hirundine such as Greater Striped Swallow (*Cecropis cucullata*) in culvert under road (may evict occupants). Eggs 1–5, usually 3–4 (mean of 65 clutches 3·7), white, sometimes with few brown spots; incubation period 14–15 days; nestling period 15–18 days; post-fledging dependence at least 7 days. Of 170 eggs in one study, 52% hatched and, of these, 81% fledged, giving overall success 42%; causes of nest failure include brood parasitism by Greater Honeyguide (*Indicator indicator*), predation by striped mouse (*Rhabdomys pumilio*) and Cape cobra (*Naja nivea*), desertion of chicks owing to mite infestation, and rain-induced burrow collapse.
Movements. Resident. In South Africa, large turnover of individuals observed at site in Free State, and is likely to wander in arid regions.
Status and Conservation. Not globally threatened. Relatively common to very common throughout range, but becomes scarcer in E, including Lesotho; only two records in Zimbabwe. May have suffered in heavily farmed areas from elimination of mammals that provide nesting habitat. Conversely, may have extended range with bush clearance for agriculture; e.g. over past 30 years has expanded into wheatfields of Western Cape, in South Africa.
Bibliography. Brown (1993), Day (1987), Earlé (1987), Earlé & Herholdt (1986, 1987, 1988), Earlé & Louw (1988), Harrison *et al.* (1997), Herholdt (1987), Herholdt & Earlé (1987), Hockey *et al.* (1989), Keith *et al.* (1992), Kopij (2003), Maclean (1993), Penry (1994), Sinclair (1984), Sinclair & Ryan (2003), Skead (1974), Skinner (1995), Steyn (1996), Tarboton (2001), Traylor (1965).

197. Sooty Chat

Myrmecocichla nigra

French: Traquet commandeur **German**: Hadesschmätzer **Spanish**: Zorzal-hormiguero Negro

Taxonomy. *Oenanthe nigra* Vieillot, 1818, west coast of Africa = Malimbe, Angola. Monotypic.
Distribution. Discontinuously Senegal, Gambia, Liberia and Nigeria E to W Kenya and E Tanzania, S to Angola and Zambia.



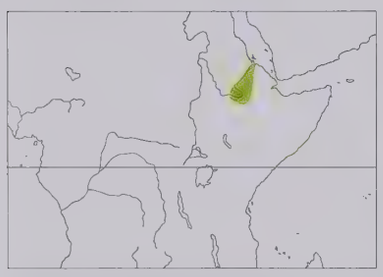
Descriptive notes. 16–18 cm; 37–46 g. Male is glossy black, with white shoulder patch, dark brown primaries; black bill and legs. Female is dark brown throughout. Juvenile male is less glossy than adult, female like adult female. Voice. Song (by both sexes) a relatively quiet but wild-sounding series of slightly varied short phrases, "tiii-tiio tiii tiii tiiiiio kuiii-iiiii-kuwiiiiir iii-iuwii-tii tseuwii-tu-skuwiiir-tsi-tsuiiit", with frequent mimicry of other birds, and more melodious and varied than that of *M. aethiops*; sometimes sings in fluttering, undulating display-flight between perches. Apparent subsong heard once from female. Calls include variety of whistles.
Habitat. Short-grass country with termitaria, with or without scattered bushes; common along roads, in farmed land and on recently burnt ground. In Cameroon and E Africa occurs mainly at 1200–1700 m (once 2320 m in Rwanda); to 1830 m, but usually lower, in DRCongo; mainly 600–2200 m in Angola, with records from near sea-level in Cabinda.
Food and Feeding. Apart from seeds and berries, only insects recorded: caterpillars, termites, ants and grasshoppers. Forages on ground, and probably also from low perch on termitarium or bush.
Breeding. Most breeding usually in rains. Almost all year in E Africa, depending on region (no Jul records), May–Jun and Oct in Uganda; Mar and breeding condition Oct in Zambia; Aug–Nov in Angola; in DRCongo, Mar–Jun in NE and Sept–Feb and Jul in SE. Nest a neat grass-lined cup, placed in burrow 1 m long dug by birds themselves or in hole in termitarium, road cutting, sandbank, aardvark or porcupine den or stump. Eggs 2–5, white, usually tinged bluish and sometimes with fine black spotting. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common locally, especially at higher altitudes, but apparently absent from certain areas which appear suitable (e.g. NW Zambia). Extremely few and widely scattered records in Senegal, Gambia and Liberia. Present in Gashaka-Gumti Reserve, in Nigeria; also in Masai Mara National Park, in Kenya, and N Serengeti National Park, in Tanzania. Density 4–6 pairs/km² in PRCongo.
Bibliography. Bannerman (1953), Benson *et al.* (1971), Borrow & Demey (2001), Carroll (1988), Chapin (1953), Dean (1976, 2000), Dowsett & Prigogine (1974), Dowsett & Dowsett-Lemaire (1997), Evans & Balmford (1992), Green (1983, 1989), Keith *et al.* (1992), Lippens & Wille (1976), Nikolaus (1987), Penry (1976), Sinclair & Ryan (2003), van Someren (1916, 1956), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

198. Rüppell's Black-chat

Myrmecocichla melaena

French: Traquet de Rüppell **German**: Einfarbschmätzer **Spanish**: Zorzal-hormiguero de Rüppell
Other common names: Rüppell's Chat

Taxonomy. *Saxicola melaena* Rüppell, 1837, Alegua Mountain, Agame Province, Ethiopia. Monotypic.
Distribution. S Eritrea and N Ethiopia.



Descriptive notes. 20 cm. Plumage is entirely black, except for white bases of inner webs of primaries on both surfaces (prominent patch in flight); bill and legs black. Sexes similar. Juvenile is duller than adult. Voice. Song a soft warbling or series of high chirping notes, given repeatedly. Call a short piercing whistle.
Habitat. Cliffs, ravines, gorges and wet rocks, above 1800 m; prefers upper areas near waterfalls but association with water not strong, and occurs in waterless bushy areas above gorges. Keeps mainly to bare rock.
Food and Feeding. Insect food seen brought to nestlings. No other information.
Breeding. Nest-building Jun, reportedly also Dec, in Eritrea; building in May–Jun and newly fledged young Aug in N Ethiopia. Nest placed in crevice in cliff. Eggs unreported, but nest with three young indicates that clutch size at least 3. No other information.
Movements. Apparently sedentary, although some altitudinal movements possible.
Status and Conservation. Not globally threatened. Restricted-range species: present in Central Ethiopian Highlands EBA. Uncommon to locally frequent; no evidence of decline or threat. Habitat unlikely ever to be much affected by human pressures. Present in Simien Mountains National Park, in Ethiopia.
Bibliography. Ash & Gullick (1989), Cheesman & Sclater (1935), Dijksen (1996b), Keith *et al.* (1992), Sinclair & Ryan (2003), Smith (1957), Stattersfield *et al.* (1998), Vivero (2001).

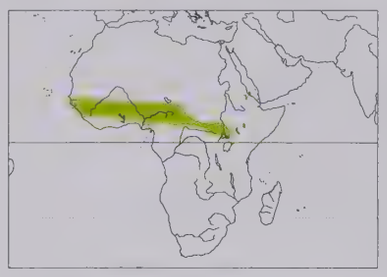
Genus *PENTHOLAEA* Cabanis, 1850

199. White-fronted Black-chat

Pentholaea albifrons

French: Traquet à front blanc **Spanish**: Zorzal-hormiguero Frentiblanco
German: Weißstirnschmätzer
Other common names: White-fronted/White-forehead Chat

Taxonomy. *Saxicola albifrons* Rüppell, 1837, Tembien, Ethiopia.
Often treated in genus *Myrmecocichla*. On basis of female plumage, nominate race and *pachyrhyncha* form one group, and the three other races another. Five subspecies recognized.
Subspecies and Distribution.
P. a. frontalis (Swainson, 1837) – Senegal and Gambia E to N Cameroon.
P. a. limbata Reichenow, 1921 – E Cameroon E to Central African Republic.
P. a. clericalis Hartlaub, 1882 – S Sudan, N DRCongo and Uganda.
P. a. albifrons (Rüppell, 1837) – Eritrea and N Ethiopia.
P. a. pachyrhyncha Neumann, 1906 – SW Ethiopia.



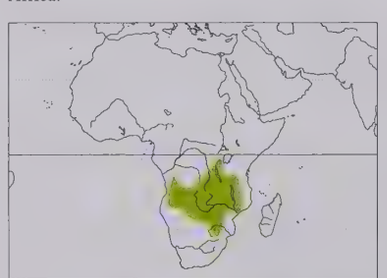
Descriptive notes. 15–16 cm; 18–25 g. Male nominate race is slightly glossy black throughout, but forehead white, flight feathers silvery-grey below; bill and legs black. Female is like male but slightly browner, with greyish-white but dark-spotted chin and throat, no white forehead. Juvenile is like respective adult, but spotted and mottled dull rufous-buff above and below. Race *pachyrhyncha* is like nominate, but male has white extending to or over mid-crown, female has throat cleaner greyish-white; *frontalis* male has more extensive white on forehead, female plain sooty; *limbata* resembles previous, but male has part-white shoulder patch; *clericalis* male is like nominate but with large white shoulder patch, female as previous. Voice. Song, from top of bush or tree, clear and far-reaching, a short rambling series of phrases with distinctive sharp complex whistles, sometimes involving mimicry, and frequently including "uwheetirr". Calls include pleasant high "twiit", and in anxiety "twiit-lii", a repeated whistled downslurred "siuu", and a series of chatter notes including sharp "tjack-tjack". Considered much quieter than congeners.
Habitat. Open savanna woodland, clearings and bushy terrain, especially with rocky areas, erosion gulleys and burnt bare stony ground; also in cultivated and semi-arid stony areas. Lowlands in most areas, but to 2000 m in Ethiopia and at 800–2500 m in Uganda.
Food and Feeding. Insects. Forages less on ground than do congeners, preferring to hunt by scanning from low perch on bush or stump and dropping to ground to take prey.
Breeding. Mainly in dry season, Nov–Feb in Mali, Apr and probably Jul in Togo, Jan in Ghana, Dec–Apr in Nigeria, Jan–Feb in NE DRCongo and Apr in Ethiopia. Nest a grass cup of twiglets and plant stalks, lined with small roots or cobweb (once curls of human hair), sited in crevice, under boulder or in hollow stump up to 1 m off ground. Eggs 2–3, pale greenish or bluish with rufous and brown spots. No other information.
Movements. Resident, but speculated as being an intra-African migrant in Mauritania.
Status and Conservation. Not globally threatened. Uncommon to locally common. Up to 5 territories found in area of 75–100 ha in N Ethiopia. Uncommon in S Sudan. Present in Murchison Falls National Park, in Uganda.
Bibliography. Bannerman (1953), Benson (1946a), Borrow & Demey (2001), Britton (1980), Chapin (1953), Cheke & Walsh (1996), Dijksen (1996a), Elgood *et al.* (1994), Huff & Auta (1977), Jensen & Kirkeby (1980), Keith *et al.* (1992), Lamarche (1988), Lippens & Wille (1976), Nikolaus (1987), Safford *et al.* (1993), Sharland & Wilkinson (1981), Stevenson & Fanshawe (2002), Wilkinson & Beecroft (1985).

200. White-headed Black-chat

Pentholaea arnotti

French: Traquet d'Arnott **German**: Arnottschmätzer **Spanish**: Zorzal-hormiguero de Arnot
Other common names: Arnott's Chat/Black-chat

Taxonomy. *Saxicola arnotti* Tristram, 1869, Victoria Falls, north-western Zimbabwe.
Sometimes placed in genus *Thamnolaea* or *Myrmecocichla*. Race *harterti* distinctive; if vocally different, may merit species status. Proposed race *leucolaema* (Rwanda and Burundi) merged with nominate. Two subspecies recognized.
Subspecies and Distribution.
P. a. harterti (Neunzig, 1926) – Angola.
P. a. arnotti (Tristram, 1869) – Rwanda and Burundi S to Zambia, C Mozambique and NE South Africa.



Descriptive notes. 16–18 cm; 35 g. Male nominate race is black with snow-white crown to nape, large white carpal patch extending to greater wing-coverts and primary coverts, tips of primary coverts black; black bill and legs. Female is like male but crown black, chin to upper mid-breast off-white (variable in extent) with tiny black tips. Juvenile is like adult, but with white tips only on head (male) or throat (female). Race *harterti* lacks white on primary coverts, male has white on head restricted to forehead and supercilium, female has smaller area of white on throat. Voice. Song (by both sexes, often together) a series of phrases made up of quiet, complex musical notes, interspersed with high thin "fiii" whistles, raspy squeaks or harsh chipping notes, and occasionally strong mimicry (at least seven species identified); lacks clear strident whistles and many of the guttural notes of songs of congeners; may sing for several minutes with only short breaks, and reportedly claps wings during song-flight. Calls include "fiii" for contact and alarm, "wee" or "wee-chit" for contact, and quiet musical "fik" or series of rapid guttural "chucks" also in alarm; alarm call of adult to fledged young may also include mimicry.
Habitat. Well-developed miombo (*Brachystegia*) and primary mopane (*Colophospermum*) woodland, also more sparsely in *Baikiaea* and *Julbernardia* woodland, preferring areas with fairly open understorey, with little herbaceous cover; occasionally in cultivated areas, and rarely around buildings. Mainly below 1500 m; 150–1600 m in Tanzania, 600–1750 m in Angola, and recorded to 1840 m in DRCongo.
Food and Feeding. Insects, especially ants and beetles, and spiders. Larvae, green caterpillars, orthopterans, moths and a mole-cricket seen fed to large young. Forages in several ways: hopping

on ground under trees, in more acrobatic search on tree trunks (sometimes perching on vertical boles), and in short sallies to ground from perch 3 m up in tree.
Breeding. Mainly at end of dry season and in early rainy season; Jan, Jul and Sept–Oct in E Africa; Jan and Aug–Nov (mainly Aug–Oct) in Zambia; Aug–Dec in Zimbabwe and Botswana; Oct–Nov in South Africa; Sept–Nov in Malawi; Aug and breeding condition Sept in Angola; Aug–Dec in S DRCongo. Three immature helpers recorded at one nest. Territory size in Zimbabwe estimated at 15 ha. Nest a bulky cup of leaf petioles, rootlets and grass stems, usually lined with grass, finer petioles, rootlets and/or feathers, placed c. 1–4 m up in tree hole, usually natural but sometimes in old hole of woodpecker (Picidae) or barbet (Capitonidae) and then usually very close to entrance but may be up to 30 cm deep (if hole deeper, fills it to this level with dung, twigs and leaves), occasionally under thatched roof; previous year's site often reused. Eggs 2–4 (usually 3), pale bluish or greenish with mauve blotches and pale brown spots; incubation period 13–14 days; nestling period 21–22 days; post-fledging dependence up to 4 months. Eight young fledged from nine eggs in Zimbabwe.
Movements. Sedentary; probably some wandering.

Status and Conservation. Not globally threatened. Was formerly listed as "Near-threatened" in S Africa, but recently judged not threatened. Locally common, but inexplicably absent from some apparently suitable areas (e.g. in N Mozambique). Has suffered considerable reduction in numbers with destruction of extensive stands of miombo woodland in Zimbabwe and possibly with destruction of mopane woodland in South Africa and Botswana, the latter from elephant damage; most mopane in S Mozambique not sufficiently tall for this species. In Zimbabwe, thought to have suffered dramatically from extensive use of DDT for tsetse-fly control; this may also have occurred in Botswana. In Botswana, density of 1 bird/1·2 ha in climax mopane woodland.
Bibliography. Barbour (1972), Barnes (2000), Benson & Benson (1977), Benson *et al.* (1971), Brooke (1984b), Chapin (1953), Clancey (1996), Collar *et al.* (1994), Dean (2000), Douthwaite (1992, 1993), Edwards (1996b), Ginn *et al.* (1989), Harrison *et al.* (1997), Herremans (1995), Irwin (1980, 1981), Keith *et al.* (1992), Lippens & Wille (1976), Maclean (1993), Mundy & Varden (1988), Parker (1999), Penry (1994), Seiler (2003a), Skinner (1995), Stevenson & Fanshawe (2002), Steyn (1996), Tarboton (2001), Tarboton *et al.* (1987), Traylor (1962, 1965), Verheyen (1953), Vincent (1935b).


ssp stellata
201
ssp elgonensis
♂
♀
202
PLATE 69
inches 3
cm 8
ssp rufescentior
ssp roberti
203
204
ssp xanthogaster
ssp erythrothorax
205
206
207
208
ssp gunningi
209
ssp bensoni
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211
212
ssp nigriceps
214
ssp polioptera
ssp schoutedeni
213
ssp bocagei
ssp granti

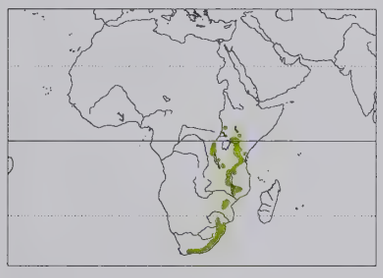
Genus *POGONOCICHLA* Cabanis, 1847

201. **White-starred Robin**

Pogonocichla stellata

French: Rougegorge étoilé **German**: Sternrötel **Spanish**: Ruiseñor Estrellado
Other common names: Starred Robin

Taxonomy. *Muscicapa stellata* Vieillot, 1818, Plettenberg Bay, Cape Province, South Africa. Subspecific taxonomy complex; one group of races (including *intensa*, *ruwenzorii*, *guttifer*, *orientalis* and nominate) has simple piping call, and another (including *macarthuri*, *helleri* and *transvaalensis*) has complex piping call, but these groups not separated in simple geographical pattern; also, subadult plumage (unique among African robins) varies depending on race. Other described races are *friedmanni*, synonymized with *ruwenzorii*; *lebombo* (Lebombo Mts, on Zululand–Swaziland border), synonymized with *transvaalensis*; and *margaritata* (described from Pietermaritzburg, in E South Africa), synonymized with nominate. Twelve subspecies recognized.
Subspecies and Distribution.
P. s. pallidiflava Cunningham-van Someren & Schifter, 1981 – Imatong Mts, in S Sudan.
P. s. ruwenzorii (Ogilvie-Grant, 1906) – NE DRCongo, SW Uganda, W Rwanda and W Burundi.
P. s. elgonensis (Ogilvie-Grant, 1911) – Mt Elgon, on Uganda–Kenya border.
P. s. intensa Sharpe, 1901 – N & C Kenya and N Tanzania.
P. s. macarthuri van Someren, 1939 – Chyulu Hills, in SE Kenya.
P. s. helleri Mearns, 1913 – Taita Hills (SE Kenya) and NE Tanzania.
P. s. guttifer (Reichenow & Neumann, 1895) – Mt Kilimanjaro, in N Tanzania.
P. s. orientalis (G. A. Fischer & Reichenow, 1884) – W, E, & S Tanzania S to Malawi and Mozambique.
P. s. hygrica Clancey, 1969 – W Mozambique.
P. s. chirindensis (Roberts, 1914) – E Zimbabwe.
P. s. transvaalensis (Roberts, 1912) – N South Africa (former Transvaal).
P. s. stellata (Vieillot, 1818) – E & S South Africa (KwaZulu-Natal, Eastern Cape and Western Cape) and Swaziland.



Descriptive notes. 15–16 cm; 18–25 g. Nominate race has slate-grey to bluish-slate hood (to upper breast), with white supraloral spot and white lower-throat spot (both often concealed); mantle to rump dull mossy-green, secondaries olive-green and primaries bluish-grey, tail black centrally and at tips, yellow laterally; underparts orange-yellow; bill black, legs pinkish. Sexes similar, female smaller. Juvenile is blackish-brown above with golden flecks, yellowish below with dark brown scaling; subadult (plumage retained for up to 2 years) dusky olive above, dusky yellow with greyish streaking or mottling below, tail greyish-brown centrally and at tips, dusky yellow laterally. Race *pallidiflava* is very pale yellow below; *intensa* is bronze-washed on back, yellow rump, slaty-edged flight-feathers, subadult olive-green above, olive-mottled yellow below; *ruwenzorii* is deeper yellow below than previous, white spots smaller, subadult similar to previous (but some juveniles apparently moult directly into adult plumage); *elgonensis* has tail all black, subadult tail blackish with variable yellow base; *guttifer* has dark olive back (subadult unknown); *macarthuri* is pale yellow below, more greenish-olive above, rump golden-yellow, narrow black tail tips, subadult olive below with narrow yellow streaking; *helleri* has back green, rump yellow, very narrow black tail tips, subadult dull greyish-olive above, grey-mottled dull yellow below; *orientalis* has rump green, uppertail-coverts greenish-yellow, primaries olive-grey, subadult as last; *hygrica* is saturated moss-green on back; *transvaalensis* resembles last but more orange-yellow below, flight-feathers more boldly and brightly edged silvery, subadult dull olive-green above, almost unmarked pale yellow below; *chirindensis* is brighter yellowish-green on back. A rare morph with pale cream underparts is known from Kenya. Voice. Geographically variable. Song used to advertise territory rather quiet, by both sexes, usually from near ground, varying among at least some races (in following list, all are type-A callers): nominate race a soft warbling, starting and ending with slurred "whiiuuu", *ruwenzorii* much faster, *orientalis* a repeated whistling phrase "tueet tueet tueet eet eet tueet" or "fur-fii-fur-fii, for-her-for-her" (4 notes per second). Courtship call in display-flight a sustained "wiii wiii wiii…". Contact and warning call loud, in two forms: disyllabic "too-twii" (type A) or multisyllabic "ter-wheh dada wiiiyoo" or "wheh chiiyoo wher-ter-wheh techiiyoo" (type B). Alarm a soft "krrrrrr" or harsh "pirrut-pirrut".
Habitat. Breeds in primary and secondary moist evergreen forest with good understorey (at least one dense thicket of shrubs or vines essential), forest edge and thickets; also in pine and wattle plantations in E Zimbabwe. Above 1600 m and mainly above 2000 m N of R Zambezi (e.g. 2130 m in Sudan), but reaching only 1300 m in Zimbabwe and down to sea-level in S of range; recorded as high as bamboo and heath zones at 4300 m in Ruwenzoris. Winters in lowland forest and (South Africa) valley bushveld; migrants pass through riverine forest, evergreen thickets in bushveld or woodland, exotic plantations and forest-edge gardens.
Food and Feeding. Small invertebrates and fruit. Of 214 faecal samples from South Africa (KwaZulu-Natal), 83% held beetles, 58% moths, 43% ants, 34% spiders, 24% flies, 23% caterpillars, 20% amphipods, 18% bugs, 18% wasps, 11% orthopterans, 4% centipedes; fruit of *Canthium*, *Cassipourea*, *Ficus*, *Hedychium*, *Ilex*, *Kiggelaria* and *Rhus* found in 34%. Elsewhere, recorded as feeding on termites, mantids, molluscs and small frogs (*Arthroleptis xenodactyloidea*). Forages at all levels of forest, but mainly in understorey, frequently descending to ground from low perch. Tosses leaf litter. In canopy, hops and flutters among foliage, gleaning leaves, twigs and bark, and aerial-sallying to snatch flying insects in manner of *Batis* flycatcher. Regularly follows driver-ant swarms, but then keeps to low perch above them. Often flirts and spreads tail; usually shy and unobtrusive.
Breeding. Aug–May in DRCongo (Dec–Feb, Ruwenzori), breeding condition Mar and Jun and suggested as breeding Aug–Nov (Kivu District); Aug in Rwanda; all months in parts of E Africa, preferring wet season in lowlands, but only dry season in highlands; Sept–Jun in Zambia; Sept–Jan in Malawi; Nov in Mozambique; Oct–Jan (peak Nov–Dec) in Zimbabwe; Sept–Dec in South Africa. Territory in KwaZulu-Natal 0·5–0·75 ha, in Malawi 0·6–0·7 ha. Nest domed, construction taking up to 7 days, made primarily of dead leaves with rootlets, tendrils and moss, lined with large soft leaf skeletons and fine plant material; well concealed, usually on sloping ground against sapling trunk or rock, sometimes a little above ground on earth bank, rock or rotting fallen trunk. Eggs 2–3, usually 2 in N and 3 S of R Zambezi, white or pale green, freckled and blotched pinkish-brown; incubation period 16–18 days; nestling period 13·5–15·5 days; post-fledging dependence 40–42 days. Brood parasitism by Red-chested Cuckoo (*Cuculus solitarius*) occurs (six of 85 nests in KwaZulu-Natal, 1 of 37 nests throughout S Africa); one record of parasitism by African Emerald Cuckoo (*Chrysococcyx cupreus*). In KwaZulu-Natal, 35 of 60 nests produced young (91 chicks from 179 eggs); of 72 pairs in Malawi, 46 successful ones produced 83 young (average 1·8 young per pair). From survey over 9 years in KwaZulu-Natal, survival rate of breeding birds was 0·77–0·90 (males), 0·68–0·84 (females); average annual mortality in Malawi 16·7–20·6% (males), 25·8–40·4% (females).
Movements. Partial altitudinal migrant, involving mainly subadults, most pronounced in S of range, where possibly total movement out of uppermost levels of breeding range in coldest months (Apr–Sept). Descends to 300 m in E Africa, to lakeshore in Malawi, to lowland forest at 350–800 m in E Zimbabwe, and to sea-level in Mozambique and South Africa, where seen 120 km from nearest known breeding sites. Adult females leave Nyika Plateau, in Malawi, Apr–Aug, while males remain. Also a sedentary population in Chipinga Forest at c. 1000 m, E Zimbabwe. Migrants move in daylight; distance travelled varies from short (within range of locally resident populations) to hundreds of kilometres. Little movement among forest fragments in sedentary population in Kenya, although genetic analysis suggests that some dispersal must occur.
Status and Conservation. Not globally threatened. Common to abundant in many parts of range, e.g. Imatong Mts (Sudan) and Itombwe Mts (E DRCongo). In N South Africa, 5 pairs in 4·5 ha, in Malawi held 36–40 pairs in 25-ha forest (former figure yields 111 pairs/km², latter 144–160 pairs/km²); in Tanzania (Udzungwa Mts), density 71 pairs or 213 individuals/km². Races *macarthuri* and *helleri* presumed to have low populations owing to restriction of ranges.
Bibliography. Baker (1984), Benson (1944), Benson & Benson (1977), Beresford (2003), Britton (1980), Burgess & Mlingwa (2000), Cave & MacDonald (1955), Chapin (1953), Clancey (1972b, 1996), Cunningham-van Someren (1976, 1981), Dick (1981), Dowsett (1985b), Dowsett & Dowsett-Lemaire (1984), Dowsett-Lemaire (1985), Duncan (1996), Galbusera *et al.* (2004), Harrison *et al.* (1997), Harwin *et al.* (1994), Irwin (1971b, 1981, 1999), Irwin & Clancey (1974), Keith *et al.* (1992), Kuiper & Cherry (2002), Lamm (1955), Lens & van Dongen (1999), Lens, Adriaensen & Matthysen (1999), Lens, van Dongen, Norris *et al.* (2002), Lens, van Dongen, Wilder *et al.* (1999), Lippens & Wille (1976), Maclean (1993), Moreau (1951), Moyer (1993), Nikolaus (1987), Oatley (1966, 1970b, 1980, 1982a, 1982b, 1982c, 1982d, 1998, 2003b), Parker (1999), Payne & Payne (1967), Prigogine (1971), Sinclair (1984), Sinclair & Ryan (2003), Steyn (1996), Stuart & Jensen (1985), Swynnerton (1907, 1908), Tarboton (2001), Tarboton *et al.* (1987), Vincent (1935b), Willis (1985), Zimmerman *et al.* (1996).

Genus *SWYNNERTONIA* Roberts, 1922

202. **Swynnerton's Robin**

Swynnertonia swynnertoni

French: Rougegorge de Swynnerton **Spanish**: Ruiseñor de Swynnerton
German: Swynnertonrötel

Taxonomy. *Erythracus swynnertoni* Shelley, 1906, Chirinda Forest, Mashonaland, Zimbabwe. Sometimes placed in genus *Pogonocichla*, but only superficially similar and has strikingly longer (and thinner) tarsus. Described race *umbratica* synonymized with nominate. Two subspecies recognized.
Subspecies and Distribution.
S. s. swynnertoni (Shelley, 1906) – E Zimbabwe and W Mozambique.
S. s. rodgersi Jensen & Stuart, 1982 – Mwanihana Forest, Chita, Udzungwa Mts and E Usambara foothills, in C Tanzania.



Descriptive notes. 12–13 cm; 14–20 g. Male nominate race has dark grey hood, white crescent on lower foreneck bordered below by black line running to neck side; mantle to rump olive-brown, wings and tail slate-grey; breast yellowish-orange, olive-tinged flanks, shading to white from belly to vent; bill black, legs greyish-pink. Female is like male but duller, hood tinged olive, buff-grey throat. Juvenile is brown with buffy-yellow spotting above, like adult below but paler. Race *rodgersi* is more olive on crown, greyer back, yellower below. Voice. "Loud song", by both sexes, a sweet high leisurely whistling phrase of two types, one with 3 and one with 4 syllables, "cha-chii-roo" and "tee ter-wer choo", arbitrarily interchanged by singer, but geographically variable even within Zimbabwe; version above from Chirinda Forest, whereas in Bvumba a moderately loud "wuut-it-chwiiiiii" and at Seldomseen a "zitt-zitt-slurr". "Warbling song" a soft musical whistling heard at ant swarms, presumably a subsong. Song of *rodgersi* a slow series of 3 (rarely 4) melancholy high-pitched notes; call a thin trill. Calls include quiet descending trill often ending with 2–3 rasping squeaks, "trrrrrrrrrrr-wii-twaw-twiiii", when alarmed at nest; high descending plaintive "siiiip" when anxious at nest; short low chirp when approaching nest.

On following pages: 203. African Flycatcher-chat (*Cossyphicula roberti*); 204. Forest Robin (*Stiphrornis erythrothorax*); 205. Gabela Akalat (*Sheppardia gabela*); 206. Lowland Akalat (*Sheppardia cyornithopsis*); 207. Equatorial Akalat (*Sheppardia aequatorialis*); 208. Sharpe's Akalat (*Sheppardia sharpei*); 209. East Coast Akalat (*Sheppardia gunningi*); 210. Usambara Akalat (*Sheppardia montana*); 211. Iringa Akalat (*Sheppardia lowei*); 212. Rubeho Akalat (*Sheppardia aurantiithorax*); 213. Bocage's Akalat (*Sheppardia bocagei*); 214. Grey-winged Akalat (*Sheppardia polioptera*).

Habitat. Moist evergreen forest on scarps or mountains. On Chirinda (Zimbabwe) and Gorongosa (Mozambique) closely associated with often dominant understorey plant *Dracaena fragrans*. Prefers areas with high, closed canopy and open understorey with good leaf litter and scattered shrubs and herbs; thus in least disturbed forest, and in more open areas of forest floor than *Pogonocichla stellata*. Normally a forest-interior bird, often near streams and sponges, but may move into edges in twilight. At 850–1800 m (generally commonest at 900–1200 m); e.g. 1000–1700 m in Udzungwa Mts, 850–1750 m on Mt Gorongosa, 1400–1700 m in Bvumba highlands, but at only 130–550 m in E Usambaras.
Food and Feeding. Mainly insects. Of 25 stomachs and four faecal samples from Zimbabwe (Chirinda), 93% held beetles, 55% ants, 38% wasps, 21% caterpillars and moths, 21% bugs, 21% spiders, 17% flies, 10% orthopterans, termites, centipedes, woodlice and small forest frogs (*Arthroleptis xenodactyloides*), and 10% small fruits; in another study, beetles and ants comprised 72% of identified food items from 20 stomachs. Forages mainly on ground, vigorously tossing aside leaf litter. Attends army-ant swarms, perching on low vantage point and dropping on flushed prey, but very rarely joins bird parties. Tail often carried at 45-degree angle.
Breeding. Oct–Jan, peak Nov–Dec, in Zimbabwe; probably same in Tanzania and Mozambique. Nest, built in 7–10 days, a variably sized open cup with wide, flat rim, made of dead leaves, rootlets and moss, lined with stems and fibres including those from tree-ferns, placed 0·3–2 m off ground (average 0·9 m in 57 cases), often at base of branch of sapling or in axils of *Dracaena fragrans* leaves; also in hollow top of dead stump, partial hollow in tree trunk, or indentation in large trunk. Eggs 2 (once 3), glossy blue-green with mauve and reddish-brown and yellowish-brown spots and blotches; incubation (apparently from first egg) 15–16 days; nestling period 14 days; repeat brood recorded once, nest completed only 14 days after previous brood fledged, indicating possibly either male assuming responsibility for new fledglings or loss of fledglings to predator. Occasional brood parasitism by Red-chested Cuckoo (*Cuculus solitarius*), 4·76% of 63 nests in Zimbabwe.
Movements. Sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Eastern Zimbabwe Mountains EBA and Tanzania-Malawi Mountains EBA. Estimated global population more than 10,000 mature individuals, but considered declining. Area of occupancy small, but common within forest patches. In Zimbabwe, common in Chirinda Forest, with density of 4–6 pairs/ha (or 1 pair/0·17–0·25 ha), but at Bvumba the forest understorey composition being radically altered by spread of an introduced ginger (*Hedychium*). Some evidence of male-biased sex ratio among adults, which may have implications for conservation. In Mozambique, common on Mt Gorongosa, which had 125-km² forest in 1970, but this now being cleared. In Tanzania, race *rodgersi* is scarce (Mwanihana) to locally common (Chita), with densities as high as 25 pairs (or 75 individuals)/km² in secondary forest, and majority of birds in Udzungwa Mts are within protected areas; but population in E Usambaras probably small and at serious risk from pole-cutting, firewood collection, cultivation and illegal pitsaw logging (but some birds present in Marimba Forest Reserve). Greater habitat protection urgently needed in Zimbabwe and Mozambique.
Bibliography. Anderson *et al.* (1997), Beresford (2003), Butynski & Ehardt (2003), Clancey (1974, 1996), Collar & Stuart (1985), Cooper (1970), Dick (1981), Dinesen *et al.* (1993), Evans, T.D. (1997), Evans, T.D. & Anderson (1993), Harrison *et al.* (1997), Harwin *et al.* (1994), Irwin (1981), Irwin & Clancey (1974), Jensen & Brøgger-Jensen (1992), Jensen & Stuart (1982), Keith *et al.* (1992), Kuiper & Cherry (2002), Maclean (1993), Manson, A.J. (1990), Manson, C. (1985), Moyer (1993), Oatley (1998), Oatley & Tinley (1989), Payne & Payne (1967), Rowan (1983), Sinclair (1984), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Steyn (1996), Swynnerton (1907, 1908), Tarboton (2001), Zimmerman *et al.* (1996).

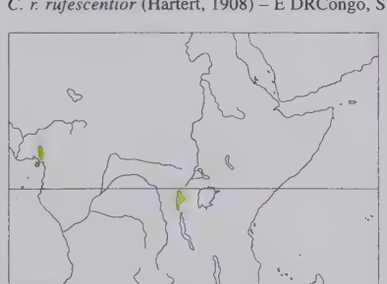
Genus *COSSYPHICULA* Grote, 1934

203. **African Flycatcher-chat**

Cossyphicula roberti

French: Cossyphe à ventre blanc **German**: Weißbauchrötel **Spanish**: Cosifa Ventriblanco
Other common names: White-bellied Robin-chat, White-bellied Robin

Taxonomy. *Callene roberti* Alexander, 1903, Bakaki, Bioko Island.
Has been placed in *Cossypha* and *Sheppardia*, and shares characters with both; vocally similar to *Stiphrornis*. Two subspecies recognized.
Subspecies and Distribution.
C. r. roberti (Alexander, 1903) – E Nigeria, W Cameroon and Bioko I (Fernando Póo).
C. r. rufescentior (Hartert, 1908) – E DRCongo, SW Uganda and Rwanda.



Descriptive notes. 13 cm. Similar in size and coloration to *Sheppardia aequatorialis*. Plumage is olive-brown from head (below eye) to upper back, with narrow white line from bill over eye, and darker wing feathers with brown edging; dull orange-rufous rump and outer tail, central tail feathers blackish; chin to neck side and breast orange-rufous, with greyish-olive flanks and whitish belly to vent; bill black, legs grey. Sexes similar. Juvenile is like adult, but with orange-rufous streaks above, washed orange and scaled black below. Race *rufescentior* has orange-rufous extending to flanks and undertail-coverts. VOICE. Song, often preceded by lengthy introduction of subdued phrases, a standard phrase, repeated with increasing intensity, consisting of 6 rapid high mournful whistles, "tsu-ti-tu-ti-tu-tu", but phrases often run together in one long phrase lasting over a minute; very like song of *Stiphrornis* in Rwanda, but judged to be short and more melancholy in Nigeria, and more muffled in E (*rufescentior*), where described as rising and falling. Alarm call a fast "ti-ti-ti-ti-ti".
Habitat. Primary and old secondary forest, at 1300 m in Nigeria, 650–2400 m in Cameroon, 800–2000 m on Bioko, 1150–2200 m in DRCongo, up to 1600 m in Uganda and to 2000 m in Rwanda. In Nyungwe Forest (Rwanda) favours moist hollows and flat areas with dense undergrowth, especially of *Mimulopsis arborescens*, often along streams.
Food and Feeding. Small invertebrates, mainly insects (including beetles and caterpillars), and small fruits (*Galmiera*). Forages in all strata, from ground up to 13 m, but typically 2–4 m up, just above shrub layer. Gleans insects from leaves; also sallies for them in air, sometimes returning to same perch.
Breeding. Breeding-condition birds Nov and Mar in Cameroon (with juveniles Feb), Nov on Bioko (juvenile Apr), Jan–May in DRCongo, and Mar–Apr and Jun in Uganda. No other information.
Movements. Sedentary; some altitudinal movement possible.
Status and Conservation. Not globally threatened. Uncommon to locally common SE Nigeria and W Cameroon; Mt Kilum (Mt Oku) is only known stronghold in Bamenda Highlands (Cameroon). Fairly common in Itombwe Mts, in E DRCongo.
Bibliography. Bannerman (1953), Beresford (2003), Borrow & Demey (2001), Chapin (1953), Dowsett (1989, 1990), Eisentraut (1973), Elgood *et al.* (1994), Keith, S. (1968), Keith, S. & Twomey (1968), Keith, S. *et al.* (1992), Lippens & Wille (1976), Oatley (1998), Pérez del Val (1996), Prigogine (1971), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Stuart (1986), Vande weghe (1988), Wilson (1987, 1989).

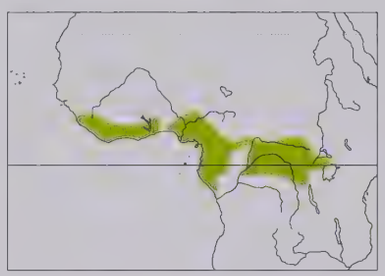
Genus *STIPHRORNIS* Hartlaub, 1855

204. **Forest Robin**

Stiphrornis erythrothorax

French: Rougegorge de forêt **German**: Waldrötel **Spanish**: Petirrojo Selvático
Other common names: Orange-throated Forest Robin

Taxonomy. *Stiphrornis erythrothorax* Hartlaub, 1855, Dabocrom.
Races appear to differ vocally, but recent treatment as four separate species perhaps premature. Proposed race *mabirae* (DRCongo and Uganda) merged with *xanthogaster*. Four subspecies recognized.
Subspecies and Distribution.
S. e. erythrothorax Hartlaub, 1855 – Sierra Leone E to S Nigeria.
S. e. gabonensis Sharpe, 1883 – W Cameroon S to W Gabon, also Bioko I (Fernando Póo).
S. e. xanthogaster Sharpe, 1903 – SE Cameroon and NE Gabon E to N & C DRCongo and S Uganda.
S. e. sanghensis Beresford & Cracraft, 1999 – SW Central African Republic.



Descriptive notes. 11–13 cm; 15–17 g. Small and short-tailed. Nominate race has slate-grey crown with blackish forehead and ear-coverts, white loral spot, olive-brown mantle to rump, olive-washed dark brown wings and tail; bright orange chin to breast grading sharply to dusky grey flanks and white remaining underparts; bill black, legs greyish. Sexes similar, female breast duller. Juvenile is greyer on face, whiter on throat, breast mottled brown and dull orange. Race *gabonensis* male is slightly greyer above than nominate, female faintly washed olive; *xanthogaster* is like *gabonensis* above, with upperparts sooty-grey, tawny orange-yellow from chin to breast shading into cream belly; *sanghensis* has breast bright orange-yellow, belly pale yellow. VOICE. Song involves duetting between pair-members, male giving sharp trills and whistles, female rasping and grinding notes; consists of a "terwii chii chii chii chii cha-why" (*xanthogaster*, Kivu), "ter ter twiii ter ter churrri" (*xanthogaster*, Uganda), "tii air hrai iiis" (*gabonensis*, Gabon), "hiiyie heir iiyie heir ii weyie" (nominate, Sierra Leone); *xanthogaster* and *sanghensis* semi-continuous, others relatively short; song of *sanghensis* begins with few high chirps and continues with series of modulated notes; several phrases may be given for several minutes in unbroken stream or rolling trill; also as single or paired phrases. Much squeaky and rattling calling at ant columns, and contact call a soft "trrr-trrrr"; calls in alarm a low hoarse "ch-chic!", faint "chup", guttural "grrrek" or "karrrr" and double "whi-whiuuu" whistle.
Habitat. Understorey and, to lesser extent, middle levels of primary lowland forest, regenerating forest, gallery forest, forestry plantations, humid coastal lowland forest (*gabonensis*), swamp-forest with dense Marantanceae understorey and dryland forest except pure Marantaceae cover (*xanthogaster*), riverine forest and dense thickets and relict forest patches in savanna. In Kivu province (E DRCongo), occupies transitional forest between lowland and Afromontane types on W slopes of Albertine Rift. In Uganda mainly at 700–1800 m; in Liberia to 1300 m, in Cameroon at 50–500 m.
Food and Feeding. Small insects and their larvae, including beetles, ants, termites, caterpillars and parasitic wasps. Forages mainly on ground or below 2 m in dense thickets, on open leaf litter and around mossy rotting logs; below and between Marantaceae in Gabon. Follows ant swarms, making short sallies from low perch after flying insects; also hops on low lianas and ground 10–30 m ahead of column, tossing leaves and taking tiny insects.
Breeding. Breeding-condition birds Apr and Jun–Oct and juveniles Apr and Aug–Sept in Liberia; fledged young Jun in Ivory Coast; Feb in Ghana, Mar in Nigeria, and Feb, May and Sept (with juveniles Jun and Oct–Nov) in Cameroon; fledged young Aug on Bioko; breeding-condition birds May–Jun in Central African Republic; Oct–Mar (juveniles Mar–Jun, Aug–Sept) in Gabon; Aug–Jan, probably all year, in DRCongo; Feb–Mar in Uganda. Territory size 6–7 ha in Gabon, 2 ha in PRCongo. Nest an open cup of moss, bark and dead leaves, lined with thin stems, rootlets and *Marasmius* fungus, often between buttresses of trees or in root system of fallen trunk, some on hollow at base of tree or on termite mound against tree bole, on or less than 1 m above ground. Eggs 2, olive-green to greenish-blue with heavy russet, orange-brown, pale chestnut and/or mauve blotching; incubation period in one case 16 days; no information on nestling period. Most nests robbed by predators (in Gabon, often chimpanzees) or parasitized by cuckoos, probably Dusky Long-tailed Cuckoo (*Cercococcyx mechowi*). A female ringed as a juvenile lived 8 years.
Movements. Sedentary, seeming to disperse very little from natal area (maximum 2·5 km in Gabon); record in Apr 1966 in W Kenya, some distance E of known range, presumably a vagrant. In Liberia may move towards water in dry season.
Status and Conservation. Not globally threatened. Race *sanghensis* judged Data Deficient when treated as full species; known only from Dzanga-Sangha Rainforest Reserve (3359 km²), in Central African Republic, where common on both sides of R Sangha. Elsewhere, frequent to locally abundant; common in Liberia, S Ghana, and Cross River National Park, in Nigeria; density in Gabon 12–15 pairs/km². Only single records from Togo and Benin.

Bibliography. Bannerman (1953), Beresford (2003), Beresford & Cracraft (1999), Borrow & Demey (2001), Britton (1980), Brosset & Érard (1986), Chapin (1953), Cheke & Walsh (1996), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Demey *et al.* (2003), Dowsett & Dowsett-Lemaire (1997), Eisentraut (1973), Gartshore *et al.* (1995), Gatter (1997), Irwin & Clancey (1974), Keith *et al.* (1992), Lippens & Wille (1976), Nikolaus (1987), Oatley (1998), Plumptre & Mutungire (1996), Prigogine (1971), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stuart (1986), Thiollay (1985), Willis (1986), Zimmerman (1967), Zimmerman *et al.* (1996).

Genus *SHEPPARDIA* Haagner, 1909

205. **Gabela Akalat**

Sheppardia gabela

French: Rougegorge de Gabela **German**: Gabelarötel **Spanish**: Akelat de Gabela
Other common names: Gabela Robin

Taxonomy. *Muscicapa gabela* Rand, 1957, 15 km south of Gabela, Angola.
Has been proposed for its own subgenus *Gabelatrix*. Monotypic.
Distribution. WC Angola.



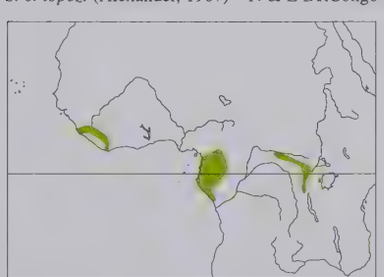
Descriptive notes. 12–13 cm; 11 g. Has brownish-olive head to lower back, rustier rump, dark brown tail with more olive fringes, dark brown wings; buffy lores and eyering; whitish throat and lower breast to vent, pale brownish-olive (slightly mottled) breastband and flanks; bill black, legs mid-brown. Sexes similar. Juvenile is darker, crown, mantle and upper breast dark olive-brown to black, scattered light olive-brown feathers, throat a mixture of light and dark brown feathers, speckled-looking hindcollar, slight impression of eyering, belly dirty white, dusky flanks, bill paler. Voice. Presumed song a series of soft, simple descending whistles.
Habitat. Primary forest where understorey densest, secondary forest with tangled patches of vegetation, and scrubby margins and overgrown areas of managed shade coffee plantations, at 810–1280 m; often comes to edges of forest near clearings and coffee plantations in twilight.
Food and Feeding. Insects. Sits motionless for long periods, sallying to glean invertebrates from foliage and branches in undergrowth.
Breeding. Breeding-condition birds Sept, juveniles trapped Jan; season doubtless coincides with local rainy season, Sept–Dec. No other information.
Movements. Presumably sedentary.
Status and Conservation. ENDANGERED. Restricted-range species: present in Western Angola EBA. Known only from 60-km stretch of escarpment between Gabela and Seles. Global population in range 1000–2500 mature individuals; considered to be declining as its habitat diminishes in extent and quality. Loss of habitat to subsistence agriculture a threat, 20–70% of canopy trees and all undergrowth in valley bottoms being cleared in some areas for bananas and sweet potatoes, and elsewhere up to 90% of canopy being removed for cassava and maize cultivation. Practice of clearing forest understorey for coffee probably robs this species of an essential habitat component, although it occurs in overgrown coffee neglected for c. 30 years. A protected area of 50 km² within its range was proposed in early 1970s, but never implemented. This recommendation needs rapid revival, adaptation to new circumstances, and implementation, along with surveys and studies to establish the full range of the species and its ecological requirements.
Bibliography. Beresford (2003), Clancey (1977), Collar & Stuart (1985), Dean (2000), Hall (1960b, 1961, 1962), Hawkins (1993), Heinrich (1958), Irwin & Clancey (1974), Keith *et al.* (1992), Mills *et al.* (2004), Oatley (1998), Pinto (1962), Rand (1957), Ryan *et al.* (2004), Sekercioglu (2004), Sinclair & Ryan (2003), Sinclair *et al.* (2004), Stattersfield & Capper (2000), Stattersfield *et al.* (1998).

206. **Lowland Akalat**

Sheppardia cyornithopsis

French: Rougegorge merle **German**: Schnäpperrötel **Spanish**: Akelat Occidental
Other common names: Lowland Robin

Taxonomy. *Callene cyornithopsis* Sharpe, 1901, Efulen, Cameroon.
Previously considered conspecific with *S. aequatorialis*. Three subspecies recognized.
Subspecies and Distribution.
S. c. houghtoni Bannerman, 1931 –Sierra Leone, S Guinea, Liberia and W Ivory Coast.
S. c. cyornithopsis (Sharpe, 1901) – S Cameroon and SW Central African Republic S to Gabon and PRCongo.
S. c. lopezi (Alexander, 1907) – N & E DRCongo and W & S Uganda.



Descriptive notes. 13 cm; 17–21 g. Nominate race is olive-brown above, including ear-coverts, wings dull brown; uppertail-coverts and tail fringes dull chestnut, tail otherwise dull brown; chin and throat orange-tinged buff, breast side olive-brown, breast to flanks rufous-orange, grading to pure white on belly; bill black, legs grey. Sexes similar. Juvenile is like adult, but breast and wing-coverts spotted rufous-buff, belly buff with dusky scaling. Race *houghtoni* is slightly less brown above; *lopezi* has flanks olive-brown, sometimes brown band separating breast from belly. Voice. Song a series of phrases separated by several seconds' pause and consisting of 2 soft alternating whistles, "whee whiu whee whiu whee whiu", these becoming purred in greater excitement ("purr peer purr") and delivery faster but weaker in response to playback ("whiu-whiu-whiu"). Calls include repeated guttural "chok", catlike call, short whistled "piee" and low "trrr" in alarm, "tcharr" when disturbed.
Habitat. Understorey of primary and secondary forest, in latter notably in streamside thicket and areas dominated by *Afromomum* (wild ginger) and *Musanga*, also forest in forest–grassland mosaic (in Liberia), gallery forest, seasonal swamp-forest and *Gilbertiodendron* closed-canopy forest or ecotone; sometimes undergrowth of plantations, e.g. *Hevea*. At dusk emerges into forest clearings. Lowlands to lower montane forest, reaching 900 m and even 1300 m in much of W Africa, but 1500 m on Mt Nimba (Liberia); 1500 m in E DRCongo, and occasionally 1200 m in Uganda.
Food and Feeding. Invertebrates, including beetles, ants, termites, caterpillars, small orthopterans, spiders and small millipedes. Forages mainly in undergrowth, using perches 0·5–2 m off ground, sallying into air after insects or flying to ground or tree trunks. Occasionally uses low perches next to roads. Attends army-ant (*Dorylus wilverthi*) swarms; occasionally joins mixed-species flocks.
Breeding. Breeding-condition males Jun–Sept and recently fledged young Jun, Oct and Nov in Liberia; adult with faecal sac Feb in Ivory Coast; juvenile with parents Dec in Gabon; Aug and Nov–May in DRCongo; breeding-condition birds and juveniles Jan–Feb in Uganda. Single undated nest described, purse-shaped with side entrance, made of moss, twigs and black fibres, 0·5 m off ground in dense undergrowth, but identity of builder questionable as this different from nest of closest congeners. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common to locally abundant, but in W Africa rare to scarce or locally common. Recorded from Taï Forest National Park, in Ivory Coast; common in Nouabalé-Ndoki and Odzala National Parks, in PRCongo. One record from S Nigeria.
Bibliography. Bannerman (1953), Beresford (2003), Beresford *et al.* (2004), Borrow & Demey (2001), Britton (1980), Brosset & Érard (1986), Chapin (1953), Christy & Clarke (1994), Colston & Curry-Lindahl (1986), Dowsett & Dowsett-Lemaire (1997), Gartshore *et al.* (1995), Gatter (1997), Kalina & Baranga (1991), Keith *et al.* (1992), Lippens & Wille (1976), MacDonald (1940), Oatley (1998), Plumptre & Mutungire (1996), Prigogine (1954, 1971), Roy *et al.* (2001), Sinclair & Ryan (2003), Thiollay (1985), Walker (1939), Willis (1986).

207. **Equatorial Akalat**

Sheppardia aequatorialis

French: Rougegorge équatorial **German**: Ugandarötel **Spanish**: Akelat Ecuatorial
Other common names: Acholi Akalat (*acholiensis*)

Taxonomy. *Callene aequatorialis* Jackson, 1906, Kericho, Lumbwa, Kenya.
Previously treated as conspecific with *S. cyornithopsis*. Two subspecies recognized.
Subspecies and Distribution.
S. a. acholiensis Macdonald, 1940 – Imatong Mts, in S Sudan.
S. a. aequatorialis (Jackson, 1906) – E DRCongo, S Uganda, Rwanda, Burundi and W Kenya.



Descriptive notes. 12–13 cm; 12–18 g. Very like allopatric nominate race of *S. cyornithopsis*; separable from sympatric lowland race *lopezi* of latter by slightly larger size, orange-rufous (not brown) flanks, grey lores and ear-coverts, lack of brown band on lower breast (also by highland-forest habitat, and voice). Sexes similar. Juvenile is very dark brown with orange-buff spotting above and below, belly mottling to whitish. Nominate race has russet-brown head and mantle; *acholiensis* has head and mantle olive-brown. Voice. Song described variously as 7 slow, subdued notes, equal-pitched except second much higher, and as single low mournful quavering "prrru" or "prruyu" or "erriyerrk", repeated every 1–2 seconds and likened to call of African Scops-owl (*Otus senegalensis*). Calls include short loud "trriii" or "trrrrir" for contact; short quiet "whit" or "whet" while foraging or in flight; dry "tchac" and a "wer-di-di-dit… cho" in excitement or aggression; and harsh quavering toad-like "kerg-kerg-kerg" in alarm. Location call of dependent juveniles a high descending "siiiip".
Habitat. Middle strata and open lower canopy of primary montane forest, breeding mainly at 1500–2100 m, but will occupy scrubby patches and edges on steep slopes; in dry season in DRCongo, recorded in dense thickets of regenerating forest; often keeps less than 2 m off ground when in thickets. Appears to replace *S. cyornithopsis* above 1485 m, dropping out at 2145 m on Ruwenzoris and Kivu volcanos, but reaching 2600 m in Rugege Forest (Rwanda) and 2500 m in W Kenya. Moves into open glades and on to pathways mainly in twilight.
Food and Feeding. Invertebrates, such as moths, beetles, orthopterans, bugs, flies, wasps, ants (not army ants), spiders and small millipedes. Forages in canopy of primary forest (up to 20 m), making frequent flycatcher-like sallies, but usually works the understorey; perches on saplings 1–1·5 m from ground, catching prey in air, gleaning it from logs and trunks, dropping on it from perch. Regularly attends driver-ant columns.
Breeding. Jan, Apr and Nov in Sudan; Oct–May and possibly throughout year in DRCongo; breeding-condition bird Apr in Uganda; breeding-condition birds and juveniles Jun–Jul in Kenya. Nest a small open cup of moss, leaves and/or fibres, placed on ground amid leaves under bush or up to 1 m off ground in buttress cleft of large tree. Eggs 2, pale green with reddish-brown spotting, or brownish-grey with purplish-brown spotting, or plain pinkish-yellow to whitish. No other information.
Movements. Some altitudinal movement, perhaps largely dispersal by subadults, in parts of Kivu province (DRCongo), where occurs at 1650 m in secondary forest and woodland mosaics in dry season (Jun). Ranges down to 1150 m NW of L Tanganyika.
Status and Conservation. Not globally threatened. Common to locally abundant, but often remarkably silent and inconspicuous. Present in various reserves, including Bwindi-Impenetrable Forest National Park, Kibale Forest National Park, Kakamega Nature Reserve and others. Formerly on Mt Elgon. S Sudan race *acholiensis* thought to be rare, but described as common in 1980s.
Bibliography. Beresford (2003), Beresford *et al.* (2004), Cave & MacDonald (1955), Chapin, J.P. (1953), Chapin, R.T. (1978), Dowsett (1990), Kalina & Butynski (1989), Keith *et al.* (1992), Lippens & Wille (1976), MacDonald (1940), Mann (1974, 1985), Nikolaus (1987), Oatley (1961, 1998), Prigogine (1971), Roy *et al.* (2001), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Zimmerman (1972), Zimmerman *et al.* (1996).

208. **Sharpe's Akalat**

Sheppardia sharpei

French: Rougegorge de Sharpe **German**: Braunbruströtel **Spanish**: Akelat de Sharpe

Other common names: Sharpe's Robin

Taxonomy. *Callene sharpei* Shelley, 1903, Masisi Hill.
Two subspecies recognized.
Subspecies and Distribution.
S. s. usambarae Macdonald, 1940 – Usambara and Nguru Mts, in Tanzania.
S. s. sharpei (Shelley, 1903) – S Tanzania, N Malawi and adjacent NE Zambia.



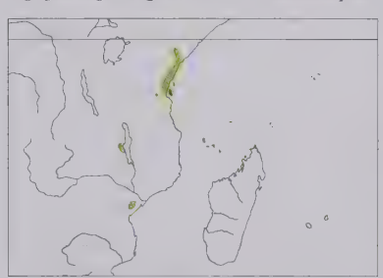
Descriptive notes. 12 cm; 12–15 g. Nominate race is brownish-olive above with short creamy supercilium, wings and tail dull brown; chin to breast and flanks orange-buff, latter paler with strong olive wash, grading to white mid-belly, yellowish-buff vent; bill black, legs greyish-flesh. Sexes similar. Juvenile is like adult, but black above streaked rufous-orange, buff below scaled dusky, no supercilium. Race *usambarae* has weaker, greyer supercilium, more buffish-orange below. VOICE. Song a simple thin reedy tinkling "chii chiddly chiddly", accelerating at end and much-repeated. Subsong near ant columns "hii hi sii wiiyou" or "sii heh chiwii chu", each phrase repeated several times, then new variation begun. Calls include a series of high metallic "pink" sometimes ending in guttural rasping "chiiyurr-churrr" in warning or alarm, possibly same as calls at ant swarms described as "iik" notes mixed with rough scolding "jazz jazz jazz" and some bill-snapping.
Habitat. Dense understorey thickets of shrubs and creepers near running water in montane forest, especially cloudforest, at 600–2600 m; e.g. 850–1250 m in E Usambaras, 600–1800 m in Udzungwas, 1500–2100 m in Malawi. Damp areas within general habitat apparently critical, and prefers wetter forest; apparently requires intact forest. Moves into forest edge and sides of pathways mainly in twilight.
Food and Feeding. Invertebrates. Forages on ground, turning over leaf litter (in one observation co-operatively), and from low perch, dropping to ground or fallen tree trunks, and sometimes sallying to take prey off leaves. Attends driver-ant swarms, and sometimes foraging flocks.
Breeding. In Tanzania, breeding-condition birds Feb and copulation Jun in N, season Sept–Nov in S; Oct–Dec in Malawi. Nest an open deep cup of dead leaves, lined with leaf skeletons, often placed 1–1·3 m up in coppice growth of lopped stump or coppice shoots from roots of *Parinari* or *Ocotea* trees, also in *Dracaena* plant. Eggs 2, pale pinkish-buff with reddish-brown markings. Occasionally brood-parasitized by Barred Long-tailed Cuckoo (*Cercococcyx montanus*). No other information.
Movements. Recorded in dry season (Jul–Aug) down to 600 m in Mwanihana Forest and Amani-Sigi Forest, in Tanzania, but above 900 m at other times of year.
Status and Conservation. Not globally threatened. Restricted-range species: present in Tanzania-Malawi Mountains EBA. Frequent to locally common. Population of 25–30 pairs in 75-ha forest (Manyenjere, on Nyika Plateau, on Malawi–Zambia border) suggests density of 33–40 pairs/km²; in Udzungwa Mts, in Tanzania, 46 pairs or 138 individuals/km². Absent from certain apparently suitable areas, for reasons not yet understood. Absence from smaller forest fragments in E Usambaras suggests that it may be sensitive to fragmentation.
Bibliography. Aspinwall (1976), Benson (1962), Benson & Benson (1977), Beresford (2003), Beresford *et al.* (2004), Dowsett & Dowsett-Lemaire (1984), Dowsett-Lemaire (1983), Jensen & Brøgger-Jensen (1992), Keith *et al.* (1992), MacDonald (1940), Moreau & Moreau (1937), Moyer (1993), Newmark (1991), Oatley (1998), Osborne (1975), Roy *et al.* (2001), Sclater & Moreau (1933), Seddon *et al.* (1999a, 1999b), Sinclair & Ryan (2003), Stattersfield *et al.* (1998), Stuart & Hutton (1977), Stuart & Jensen (1985), Svendsen & Hansen (1995), Willis (1985), Zimmerman *et al.* (1996).

209. East Coast Akalat

Sheppardia gunningi

French: Rougegorge de Gunning **German**: Blauflügelrötel **Spanish**: Akelat de Gunning
Other common names: Gunning's Robin, Eastern/Gunning's Akalat

Taxonomy. *Sheppardia gunningi* Haagner, 1909, Mzimbiti, near Beira, Mozambique.
Race *bensoni* strikingly distinctive, possibly better treated as a separate species. Four subspecies recognized.
Subspecies and Distribution.
S. g. sokokensis (van Someren, 1921) – coastal SE Kenya, NE Tanzania, and Zanzibar I.
S. g. alticola Fjeldså *et al.*, 2000 – Nguu Mts, in E Tanzania.
S. g. bensoni Kinnear, 1938 – NC Malawi.
S. g. gunningi Haagner, 1909 – C Mozambique.



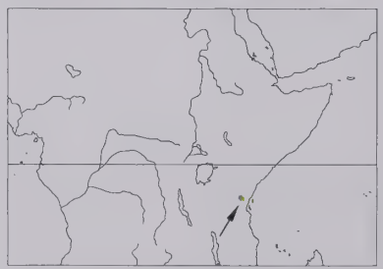
Descriptive notes. 11–12 cm; 16–19 g. Nominate race is bronze-brown above, wings brown with greyish outer webs of primaries, tail greyish-brown, lores and supercilium bluish-grey, white spot above lores (visible during display), ear-coverts olive-brown; chin yellowish-orange, shading to orange-rufous on throat to neck side and breast, belly white, flanks yellowish-olive, vent buffy; bill blackish, lower base yellowish; legs greyish-pink to pinkish-brown. Sexes similar. Juvenile is buff-dappled olive-brown above, buffy with reddish-brown flecks below. Race *sokokensis* is shorter-winged than nominate, bluer supercilium and lores, richer orange below; *bensoni* is longer-winged, extensively orange-buff below, only vaguely white on mid-belly; *alticola* is similar to previous in wing length and in restricted extent of white on belly, but with more conspicuous white on lores, generally duller overall coloration, greyish above and yellowish below. VOICE. Song a series of fast phrases 2 seconds long, typical phrase "tuyutwiyu-tutuyutwiyu-tutuyutwiyu-tutuyu" or "tureea-tureea-tureea", sometimes run together into monotonous minute-long uniform warbling (white supraloral spots erected during song, retracted at end of phrase); songs in Malawi and Mozambique recognizably similar, but songs of Sokoke birds provoke no response from Malawi birds (or *vice versa*). In response to playback of song, gave descending trisyllabic call similar to (but an octave higher than) that of Red-chested Cuckoo (*Cuculus solitarius*). Other calls include repeated piping "siiip" interspersed with guttural clicks, latter sometimes rapidly repeated; this presumably the low "prrrt", considered possibly vocal, which accompanies flirting of wings and spreading of tail. Also a low, sweet warbling subsong, reportedly given from dense tangles during winter, and race *alticola* said to give far-carrying, siren-like call of 2 notes.
Habitat. Dry lowland and mid-elevation moist evergreen forest, preferring moist valley bottoms with luxuriant vegetation or light gaps (caused by treefalls or steep gulleys) and partially open understorey; often in vicinity of mossy logs or dead wood. Mainly below 300 m, but race *alticola* at 1140–1750 m in Nguu Mts; in Malawi, mainly below 610 m along shores of L Malawi. In Arabuko-Sokoke Forest, in Kenya, commonest in dry *Cynometra–Manilkara–Brachylaena* forest, less common in *Afzelia* forest, and absent from *Brachystegia* woodland. Not found in degraded forest in Kenya, but in Tanzania, Malawi and Mozambique found in secondary forest lacking tall trees after logging, and with well-developed understorey or, conversely, in taller forest with understorey cleared by elephants. Keeps mainly to understorey, but frequent in mid-levels, rare in canopy. Moves into open glades and on to pathways mainly in twilight.
Food and Feeding. Seeds, berries and invertebrates: ants, termites, beetles, bugs, moths, caterpillars, cockroaches, crickets and other orthopterans, and spiders; also very small frogs. Nestlings fed with caterpillars, orthopterans, spiders, lepidopterans, mantises, a millipede and an insect egg. Forages on ground, in lowest levels and in middle strata of forest. Commonly drops to ground from low perch (often at edge or along cuttings) for prey; regularly attends driver-ant swarms, and uses same method. Of 15 foraging individuals, twelve were taking food from ground, two from fallen dead wood, and one from leaves 1 m above ground; in six cases sallied from perches, in three hopped along ground and turned leaves, and in two cases fed in association with a four-toed elephant shrew (*Petrodromus tetradactylus*). Sometimes feeds in association with *Cossypha natalensis* and *Erythropygia quadrivirgata*, and joins mixed feeding flocks.
Breeding. Nov–Jan; also juvenile Apr in Kenya. Of three nests observed at nestling stage, two provisioned by pairs and one by a trio (probably two males and one female). Nest a deep, slightly domed cup made of rootlets, built into leaf litter or behind dead stem; one in Malawi, built by both sexes, was in recess of vertical bank of dry streambed, one in Mozambique was on ground among roots of stump, and four in Kenya were on ground. Eggs 2–3, white with russet-brown spots and blotches. No other information.
Movements. Most populations probably sedentary; some altitudinal movement suspected on Mt Choma, in Malawi, outside breeding season.
Status and Conservation. VULNERABLE. Global population placed at over 10,000 mature individuals, but considered declining (rapidly in many places); occupied range probably less than 1000 km² (only 470 km² outside Mozambique, where surveys needed to clarify status of both species and habitat). Fairly common to common within very restricted range, e.g. 6 pairs in 7·5 ha of forest on Choma Mt, in Malawi, yielding density of 80 pairs/ km²; 3000 pairs of Malawi race *bensoni* estimated to exist. In Kenya, 7500–9000 pairs in Arabuko-Sokoke Forest, where density from 0·23 birds/ha in mixed forest to 0·81 birds/ha in one area of *Cynometra*; c. 2000 territories likely in Shimba Hills, where elephant damage a threat; in Tanzania, c. 5000 territories in lowland E Usambaras. Very sensitive to forest disturbance at Arabuko-Sokoke and Shimba Hills, but appears to tolerate secondary growth in E Usambaras and in C Mozambique. Arabuko-Sokoke Forest the subject of a long-term sustainable-management project, and Shimba Hills a national reserve. Several Tanzanian sites are forest reserves, but others are not and protection needed; race *alticola* has small (140 km²) and fragmented (four main forest fragments) range. Lowland forest in Malawi and Mozambique under increasing human pressure; in Malawi remaining lakeshore plain forest mainly in four forest reserves which need greater support, while escarpment forest relatively secure owing to low human populations. In Mozambique, extensive commercial logging, charcoal-burning and slash-and-burn agriculture have already destroyed large tracts of forest between Beira and R Zambezi, including around type locality of Dondo; seven territories in c. 4·5-ha Chinizuia Forest indicate density of 0·64 pairs/ha.
Bibliography. Archer & Iles (1998), Bennun & Ngoroje (1999), Benson (1946b), Benson & Benson (1977), Beresford (2003), Britton (1980), Chittenden & Coley (2000), Clancey (1969b, 1985, 1996), Collar & Stuart (1985), Dowsett-Lemaire (1989), Evans, T.D. (1997), Evans, T.D. *et al.* (1994), Fjeldså *et al.* (2000), Irwin (1963), Jones (1999), Keith, S. (1968), Keith, S. *et al.* (1992), MacDonald (1940), Matiku *et al.* (2000), Mlingwa *et al.* (2000), Nemeth (1996), Nemeth & Bennun (2000), Nemeth *et al.* (2003), Oatley (1970a, 1998), Oyugi & Amutete (1999), Roy *et al.* (2001), Seddon *et al.* (1999a, 1999b), Sinclair (1984), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Waiyaki & Bennun (2000), Zimmerman *et al.* (1996).

210. Usambara Akalat

Sheppardia montana

French: Rougegorge des Usambara **German**: Usambararötel **Spanish**: Akelat de los Usambara
Other common names: Usambara Alethe

Taxonomy. *Alethe montana* Reichenow, 1907, Usambara, Tanzania.
Formerly allocated to genus *Dryocichloides* along with *S. lowei*, with which was at one time considered conspecific. Has also been placed in *Alethe*. Biomolecular studies suggest that separate generic status for these and several other species may be appropriate. Monotypic.
Distribution. W Usambara Mts, in NE Tanzania.



Descriptive notes. 13–14 cm; 15–26 g. Plumage is dark brownish-olive above, slightly paler on mantle to back, dark rufous-brown rump and tail, dark brown wings; whitish preorbital area, orange-rufous spot above lores (concealed except during display); ear-coverts and neck side pale olive-grey; throat and belly whitish, breast and upper flanks olive-grey, darker on lower flanks, vent pale buff; bill black, long legs brownish-grey. Sexes similar. Juvenile is blackish above, mottled buff, dark brown below, mottled whitish. VOICE. Song or subsong a series of long thin notes on one pitch, "ii siibii ii hii-hii ii siibii hii lichii siibii", also described as continuous rising and falling series of lispy notes, frequently interspersed with harsh "chahh"; also a short clear "twi-tew liitiew" or "wi-tew-twi-i-chew". Calls include scolding nasal "jahh jah jah jah" in alarm, which may be given in rhythmic rising series, and at ant swarms variety of sounds such as faint rattling "chr-r-r-r-riii", faint "chup" and song-like "iik" or "iiliik".
Habitat. Montane forest: in undergrowth, thickets and degraded areas with partial canopy, at 1600–2300 m, being especially numerous above 2000 m. Seeming replacement for *S. sharpei*, which is confined to areas below 1600 m.

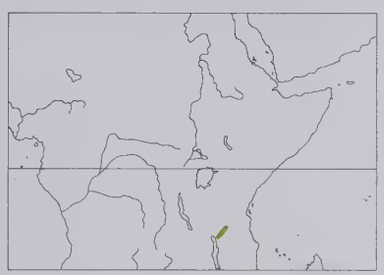
Food and Feeding. Small invertebrates. Forages mainly on ground, tossing aside leaves; also sallies from low perch to take prey from ground, trunks, lianas and branches, and in air. Habitually follows army ants, when as many as twelve individuals birds may occur together, and in company with other forest thrushes.
Breeding. Breeding-condition birds and juveniles Oct–Mar, most Nov–Dec. No other information.
Movements. Sedentary.
Status and Conservation. ENDANGERED. Restricted-range species: present in Tanzania-Malawi Mountains EBA. Common to locally abundant within very small area of occupancy (c. 140 km²), but unobtrusive. Known from only three forests, Shume, Shagayu and Mazumbai; although very rare in the last, density in first two is 2–3 birds/ha, so that global population around 1980 estimated to be c. 28,000 individuals. Encroachment for subsistence agriculture still apparently continues, however, and is presumably fragmenting and diminishing the population. Most of its range lies within forest reserves.
Bibliography. Beresford (2003), Beresford *et al.* (2004), Collar & Stuart (1985), Keith *et al.* (1992), Roy *et al.* (2001), Sclater & Moreau (1933), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Stuart & Hutton (1977), Turner (1977), Vande weghe (1988), van der Willigen & Lovett (1981), Willis (1985), Zimmerman *et al.* (1996).

211. Iringa Akalat

Sheppardia lowei

French: Rougegorge de l'Iringa **German**: Njomberötel **Spanish**: Akelat del Iringa
Other common names: Iringa Alethe

Taxonomy. *Alethe lowei* C. H. B. Grant and Mackworth-Praed, 1941, Njombe area, southern Tanzania.
Formerly allocated to genus *Dryocichloides* along with *S. montana*, with which was at one time considered conspecific. Has also been placed in *Alethe*. Biomolecular studies suggest that separate generic status for these and several other species may be appropriate. Monotypic.
Distribution. Udzungwa Mts S to Livingstone Mts, in S Tanzania.



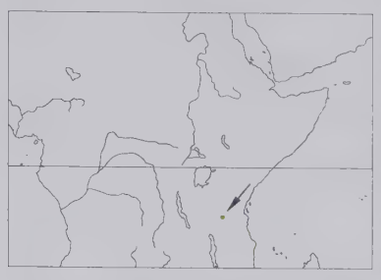
Descriptive notes. 13 cm; 16–21 g. Somewhat resembles *S. sharpei* in plumage, but structurally rather different, being larger and longer-legged; also with duller, buff underparts, shorter, buffier supercilium. Sexes similar. Juvenile is like juvenile *S. montana* and *S. sharpei*. VOICE. Song or subsong a long series of loud whistles, "wii" or "wrii", 2 per second, also as a series of tinkling trills, "her-hii her-her-her-her hiir her hiir her hiir her"; also described as a slowly rising and falling series of simple loud piping notes and downslurs, often interspersed with snatches of Spot-throat (*Arcanator stictigula*) imitations. Calls include nasal rattling "ra-a-a-a-a-a-a-ah" in alarm, repeated "tak" in aggression, and tinkling trilling "chi-i-i-i-i chi-i-rii-i-i-i-her" in submission.
Habitat. Relatively dry montane forest and thickets, at 1350–2500 m, replacing *S. sharpei* at lower of these limits; more abundant at higher elevations within range. In Udzungwa National Park, at 1400–1700 m, occurs in wet forest. Tolerant of some habitat disturbance; occurs in disturbed fragments between tea fields in Udzungwas.
Food and Feeding. Small invertebrates. Forages mainly on ground, tossing aside leaves, but also searches among leaf tangles, gleans trunks, lianas and branches, and sallies after flying prey. Habitually attends army-ant swarms, where commonly involved in aggressive interactions with conspecifics. Shy and elusive, but sometimes becomes more approachable. Flicks wings and raises tail when alarmed.
Breeding. Breeding-condition birds and juveniles reported during Sept–Feb. No further information available.
Movements. Sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Tanzania-Malawi Mountains EBA. Global population placed at over 10,000 mature individuals; considered to be declining owing to forest destruction, at least in Southern Highlands, and found at fewer than ten localities. Uncommon to locally common within small range; up to 15 pairs (or 45 individuals)/km² in Udzungwa Mts, where fundamentally secure owing to Udzungwa National Park; also present in several forest reserves, including ones in Ukaguru Mts that are on terrain too steep to clear. Recommendation to survey Rubeho Mts to check for presence resulted in discovery of *S. aurantiithorax*, and therefore present species evidently absent there.
Bibliography. Beresford (2003), Beresford *et al.* (2004), Collar & Stuart (1985), Dinesen *et al.* (1993), Evans & Anderson (1993), Fjeldså (1999), Fjeldså *et al.* (1997), Grant & Mackworth-Praed (1941), Jensen & Brøgger-Jensen (1992), Keith *et al.* (1992), Moyer (1993), Roy *et al.* (2001), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Turner (1977), Vande weghe (1988), van der Willigen & Lovett (1981), Willis (1985).

212. Rubeho Akalat

Sheppardia aurantiithorax

French: Rougegorge de Tanzanie **German**: Rubehorötel **Spanish**: Akelat de Rubeho

Taxonomy. *Sheppardia aurantiithorax* Beresford *et al.*, 2004, Mafwemiro Forest, in the Rubeho Mountains of Tanzania.
Molecular studies suggest most closely related to *S. lowei*, from which it is geographically separated by the Great Ruaha River gorge; initially thought to be an isolate of that species. The two may merit separate generic treatment. Monotypic.
Distribution. C Tanzania, in Rubeho Highland, Wota Forest (Wota Mts) and Ukaguru Mts.
Descriptive notes. c. 14 cm. Plumage is dark slate above, with coppery wash especially on rump and trailing edge of tail; forehead to nape tawny-olive, feathers of lores and above eyes tipped brown, with exposable yellow and white bases; ear-coverts and malar region brown with yellow wash; throat, upper breast and underwing-coverts deep orange, breast dark ochre, flanks tawny-olive, lower breast and belly cream-buff, vent deep orange; bill black, legs grey. Sexes similar. Juvenile has long orange spots on cheek, crown and some wing-coverts. VOICE. Song unknown. Nasal dry rattles, "t-t-t-rrrr" or "trrr-rrr-rrr", which may be repeated for long periods, probably as alarm; may be interspersed with low, smacking "tjytjy-tjyt".
Habitat. Understorey of montane forest, at 1800–2200 m.



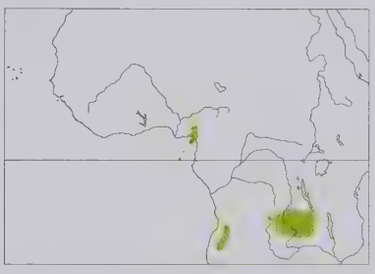
Food and Feeding. Presumably small arthropods. Feeds on ground and low branches, making short spurts and sallies. Probably attends driver-ant swarms.
Breeding. Immature judged to be 2 months old captured in Jun, so eggs probably laid in Mar, at start of "long rains". No other information available.
Movements. One individual trapped at 400 m in foothills of Uluguru Mts in Aug, suggesting that dry-season movements to lower altitudes may occur; this implies ability to cross more than 100 km of lowland savanna.
Status and Conservation. Not globally threatened. Appears to be fairly common within small range. First caught in Ukaguru Mts in 1989, but initially attributed as an isolate of *S. lowei* and only described as a new species in 2004.
Bibliography. Beresford (2003), Beresford *et al.* (2004), Evans & Anderson (1993).

213. Bocage's Akalat

Sheppardia bocagei

French: Rougegorge de Bocage **German**: Bocagerötel **Spanish**: Akelat de Bocage
Other common names: Bocage's Robin/Ground-robin; Fernando Póo/Short-tailed Akalat (*poensis*)

Taxonomy. *Cossypha bocagei* Finsch and Hartlaub, 1870, Biballa, Angola.
Formerly placed in genus *Cossypha*. Nominate race and *chapini* belong to a "southern (S) group", inhabiting lowland forest, the remaining races to a "northern (N) group", which inhabits montane forest; the two groups have been proposed as separate species on basis of morphological and structural differences, and reported vocal differences, but unclear whether appropriate samples have been compared; further detail required. When species placed in genus *Cossypha*, name *poensis* becomes preoccupied, and population of Bioko receives name *insulana*. Eight subspecies recognized.
Subspecies and Distribution.
S. b. granti (Serle, 1949) – SE Nigeria and W Cameroon.
S. b. poensis (Alexander, 1903) – Bioko I (Fernando Póo).
S. b. schoutedeni (Prigogine, 1952) – E DRCongo.
S. b. kaboboensis (Prigogine, 1955) – Mt Kabobo, in E DRCongo.
S. b. kungwensis (Moreau, 1941) – Mt Kungwe, in W Tanzania.
S. b. ilyai (Prigogine, 1987) – E of Mt Kungwe, in W Tanzania.
S. b. chapini (Benson, 1955) – SE DRCongo, SW Tanzania and N Zambia.
S. b. bocagei (Finsch & Hartlaub, 1870) – W Angola.



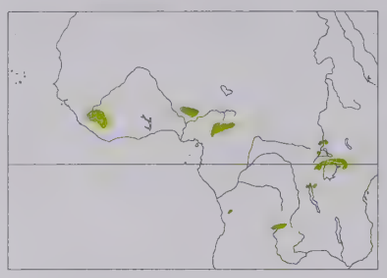
Descriptive notes. 13 cm; 16–21 g. Nominate race has dark grey crown with pale greyish lores, white supraloral stripe, tawny-olive mantle to rump, wings dull brown, tail tawny-brown with foxy-rufous outer feathers; orange-rufous ear-coverts, neck side and underparts, shading whitish on belly; bill black, legs pinkish-grey. Sexes similar. Juvenile undescribed; juvenile *granti* as adult, but with rufous spots. Race *granti* has shorter and darker red tail than nominate, less tawny above, crown continuous tawny-olive with upperparts, with black line under eye; *poensis* is similar to previous, but crown and ear-coverts darker or blackish, underparts richer rufous; *kungwensis* is also similar, but crown olive-grey; *kaboboensis* resembles last, but lores and ear-coverts slate-grey; *schoutedeni* has crown slaty-black without olive tinge; *chapini* is like nominate but less tawny above, slightly paler below, crown with slight olive wash; *ilyai* is like last, but crown more olive-grey, flanks washed olive. VOICE. Song a series of a standard simple, sweet yet mournful phrase, "diii da, du-du-du-du, dii da dii", last few notes highest, first and last two slightly slower; Zambian birds (from "S group") said to give 3–6 high-pitched thin whistles with last notes highest-pitched, while those presumably from Tanzania have loud and emphatic rising and falling song with short phrases, rather forced and unmusical. Calls include single, double or triple high "siiip" in alarm, and soft sibilant ratchet and twitter used for contact and, given louder, as scolding alarm.
Habitat. Undergrowth of submontane and montane forest. "N group" inhabits transitional and montane evergreen forest, including bamboo and secondary coffee forest, at 600–1700 m in Cameroon, 1250–2450 m in E DRCongo, 800–2500 m on Bioko, 850–2200 m in Angola, 1300–2400 m in Tanzania. "S group" at largely similar elevations (1300–1500 m) but in gallery forest within *Brachystegia* woodland, evergreen forest patches on boggy ground in grassland ("mushitu forest"), or Afromontane forest on Angolan inselbergs. Moves in twilight into adjacent woodland, wild ginger (*Afromomum*) growth and tracksides.
Food and Feeding. Mainly insects, including beetles (Tenebrionidae, Staphylinidae), flies (Diopsidae, Tipulidae), bugs (Psyllidae, Reduviidae), cockroaches, moths, lacewings (Mantispidae), termites, ants (*Camponotus*, *Pheidole*) and especially wasps (including Braconidae); one bird seen to eat at least 20 small wasps. Also spiders. Forages mainly from perch, dropping to catch prey on ground. Attends army-ant swarms; at least on Bioko, joins small mixed-species flocks.
Breeding. Dec–Mar in Cameroon, Oct–Dec in Zambia and S DRCongo, Dec–May in E DRCongo; breeding-condition birds Nov on Bioko and Aug–Sept in Angola. Single nest described (found in Nov), a moss cup with thin lining of black fibres, placed inside fissure in hollow stump in deep shade, 0·75 m from ground. Eggs 2, cream with fine pale chestnut-brown and ashy mottling. No other information.
Movements. Sedentary. However, a juvenile at sea-level on Mt Cameroon and another at 400 m on Bioko may have been altitudinal migrants as part of post-fledging dispersal.
Status and Conservation. Not globally threatened. Frequent to locally abundant. In W Africa, at least, commonest at lower elevations; rare on Obudu Plateau, in Nigeria. Common on Bioko. Locally common in Angola. In Zambia, 3–4 birds in forest patch less than 1 ha, yielding density of at least 300–400 birds/km².
Bibliography. Aspinwall & Beel (1998), Bannerman (1953), Benson (1955), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1980), Chapin (1953), Dean (2000), Eisentraut (1973), Hall & Moreau (1970), Keith *et al.* (1992), Lippens & Wille (1976), Moreau & Benson (1956), Oatley (1998), Pérez del Val (1996), Prigogine (1971, 1987), Roy *et al.* (2001), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Stuart (1986), Traylor (1962), Vande weghe (1988), Vincent (1947), White (1945).

214. **Grey-winged Akalat**

Sheppardia polioptera

French: Cossyphe à sourcils blancs **German**: Grauflügelrötel **Spanish**: Cosifa Aligrís
Other common names: Grey-winged Robin/Ground-robin, Grey-winged/Pygmy/White-browed Robin-chat

Taxonomy. *Cossypha polioptera* Reichenow, 1892, Bukoba, Lake Victoria, Tanzania.
Sometimes placed in *Cossypha* owing to behaviour, mimicry skills and egg coloration; placement in present genus based on plumage of juvenile, erectile supraocular tufts and unpatterned tail, and this supported by biomolecular study. Has also been placed in *Dryocichloides*. Proposed race *grimwoodi* (known only from type locality in Mwinilunga District, in N Zimbabwe) merged with nominate. Three subspecies recognized.
Subspecies and Distribution.
S. p. nigriceps (Reichenow, 1910) – Sierra Leone, N Liberia, W Ivory Coast, C & E Nigeria and adjacent C Cameroon.
S. p. tessmanni (Reichenow, 1921) – E Cameroon.
S. p. polioptera (Reichenow, 1892) – S Sudan, W & S Uganda, W Kenya, NW Tanzania, Burundi, NW & E Angola, extreme NW Zambia and S DRCongo.
Descriptive notes. 14–15 cm; 15–23 g. Nominate race has slaty-grey crown shading to olive-brown mantle, darker wings with olive-brown edges, more rufous rump and plain rufous-brown tail; narrow but erectile white supercilium stopping after eye, broad black line from bill through eye to ear-coverts; rufous-orange from chin to neck side and belly, shading paler on vent; bill black, legs grey-brown. Sexes similar, female crown often tinged olive. Juvenile is tipped rufous on face, crown and wing-coverts, lacks supercilium. Race *nigriceps* has crown black, with supercilium to over ear-coverts, rufous-orange hindcollar; *tessmanni* is similar to previous but darker. Voice. Song, higher-pitched than *Cossypha*, a fast or slow series of variable phrases consisting of sustained whistled notes, "twiit-twiit-twiit turr-turr-turr siwiit-siyuur siit-siit titiur-titiur turii-turii-turii"; also mournful, descending 3-note whistle. Some loud songs composed exclusively of mimicry, especially of pigeons (Columbidae), cuckoos (Cuculidae), bee-eaters (Meropidae), shrikes (Laniidae), orioles (Oriolidae), bulbuls (Pycnonotidae), flycatchers (Muscicapidae), and other thrushes. Calls include sibilant "kwick-kwiick kwick-kwick-kwick" in alarm, soft "chut" in anxiety, and whistled "tii-taa-tu-tu-twiiii" (first 3 notes quiet) for contact.



Habitat. Lowland and submontane evergreen forest, especially riverine and gallery forest, forest patches in savanna; in N Zambia "mushitu" moist evergreen forest on boggy ground. Favours densely grown edges and thick secondary areas by clearings. To 400 m in W Africa, but "very abundant" in high forest and low primary scrub at 1000–1500 m on Mt Nimba (Liberia); 1800 m in DRCongo and Sudan, c. 1250 m in Angola, and between 1100 m and 2150 m in E Africa.
Food and Feeding. Insects, including beetles (families Carabidae, Tenebrionidae), ants (Camponotidae), bugs (Pentatomidae, Lygaeidae), moths and caterpillars, ichneumon wasps, tipulid flies and orthopterans; also scorpions and spiders. Forages mainly on ground, often along streams, but also in middle strata and in lower canopy.
Breeding. Breeding-condition birds Jan and fledged young Mar in Liberia; breeding-condition birds Jun in Nigeria; nests in Sept–Oct in DRCongo; Apr, Jun and Oct, with juveniles Aug–Sept, in Uganda; Sept–Nov in Zambia. Nest (two described) a cup of moss, lined with grass, plant stems or black vegetable fibre; one, in Zambia, in small indentation 20–30 cm deep located 0·5–1 m up in sandy earth bank; other, in Ivory Coast, 50 cm above ground in cleft in tree trunk. Eggs 2 in Ivory Coast, 3 in Zambia, uniform olive-brown (Ivory Coast), olive-green (Uganda), or greenish-turquoise and slightly mottled (Zambia). No other information.
Movements. Sedentary; possibly a local migrant, Jul–Oct, in Sudan.
Status and Conservation. Not globally threatened. Locally common, but generally rather scarce. Recorded from Gashaka-Gumti Reserve, in Nigeria, Bwindi-Impenetrable Forest National Park, in Uganda, and Kakamega Nature Reserve, Nandi Forest Reserve and Saiwa National Park, in Kenya. Density 18 pairs/10 ha in Liberia.
Bibliography. Aspinwall & Beel (1998), Bannerman (1953), Benson *et al.* (1971), Beresford (2003), Borrow & Demey (2001), Charge (1998), Colston & Curry-Lindahl (1986), Dean (2000), Dowsett (1989), Gatter (1997), Gaugris *et al.* (1981), Gee & Heigham (1977), Keith *et al.* (1992), Lippens & Wille (1976), Mann (1985), Nikolaus (1987), Oatley (1970a, 1998), Rainey & Oatley (2003), Sinclair & Ryan (2003), van Someren (1916), Stevenson & Fanshawe (2002), Vande weghe (1988), Zimmerman *et al.* (1996).

PLATE 70 ➤



PLATE 70

inches 4

cm 10

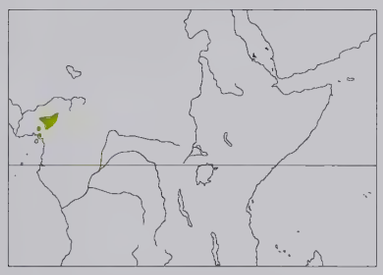
Genus *COSSYPHA* Vigors, 1825

215. Mountain Robin-chat

Cossypha isabellae

French: Cossyphe d'Isabelle **German**: Kamerunrötel **Spanish**: Cosifa de Isabel
Other common names: Mountain Robin, Cameroon Robin-chat

Taxonomy. *Cossypha Isabellae* G. R. Gray, 1862, Cameroon Mountain, 7000 feet [c. 2130 m], Cameroon.
Has sometimes been placed in genus *Dryocichloides* or in *Sheppardia* or *Oreocossypha*. Two subspecies recognized.
Subspecies and Distribution.
C. i. batesi (Bannerman, 1922) – E Nigeria and W Cameroon.
C. i. isabellae G. R. Gray, 1862 – Mt Cameroon (SW Cameroon).



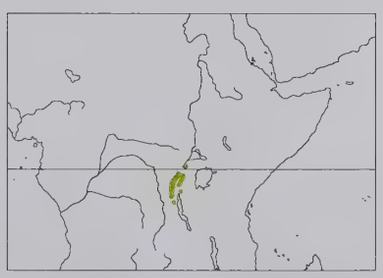
Descriptive notes. 15 cm; 19–28 g. Nominate race is dark olive-brown above and on cheeks, with whitish supercilium fading behind eye, rufous-chestnut rump and tail, latter with blackish central feathers and terminal band; orange-rufous from chin to breast, buffier on mid-belly; bill black, legs brownish-grey. Sexes similar. Juvenile is like adult, but streaked and mottled rufous-buff above, dark brown with mottled buff below. Race *batesi* is paler above, duller below and whitish on belly, but cheek dark brown. Voice. Song very like that of *C. archeri*, a tuneless, monotonous series of high trilled phrases, "titty-churrr terrr-whiiiiiii", last note ascending; sometimes abbreviated to "churrr chayiiii" and may be repeated up to five times to give 10-note phrase. Call a quiet snoring "drrr".
Habitat. Understorey of montane forest at 1100–2700 m, but as low as 800 m on Mt Cameroon, where generally commoner at higher altitudes, especially above 1200 m. Favours wooded ravines and dwarf trees amid boulders at higher elevations; occasionally forages in coco-yam fields.
Food and Feeding. Insects, including beetles, and small seeds. Forages on ground and in low undergrowth; perches on shrubs, fallen trees, tree stumps, and occasionally in branches up to 9 m off ground. Follows *Dorylus* army-ant swarms.
Breeding. Probably mainly Mar–Sept, coinciding with start of long rains; only certain dates are Sept in Cameroon (brood patches Jul–Aug, juveniles Mar and Jun) and Mar in Nigeria. Nest a domed cup of moist moss, lichen, roots and leaf skeletons, lined with fine grass stems, in hollow on ground, or 1·5 m up in top of dead stump or in cleft in rock or tree. Eggs 2, pale greenish-blue with faint rusty speckling. No other information.
Movements. Sedentary, so far as is known.
Status and Conservation. Not globally threatened. Restricted-range species: present in Cameroon Mountains EBA. Fairly common. Commonest at highest elevations. Mt Kilum (Mt Oku) is an important stronghold.
Bibliography. Bannerman (1953), Beresford (2003), Borrow & Demey (2001), Dowsett (1989), Eisentraut (1963, 1973), Elgood *et al.* (1994), Green (1990), Keith *et al.* (1992), Oatley (1998), Serle (1950b), Sinclair & Ryan (2003), Stattersfield *et al.* (1998), Stuart (1986), Wilson (1987).

216. Archer's Robin-chat

Cossypha archeri

French: Cossyphe d'Archer **German**: Ruwenzorirötel **Spanish**: Cosifa de Archer
Other common names: Archer's Robin

Taxonomy. *Cossypha archeri* Sharpe, 1902, Ruwenzori, Uganda.
Recently placed by one authority in *Dryocichloides*. Race *albimentalis* synonymized with nominate. Two subspecies recognized.
Subspecies and Distribution.
C. a. archeri Sharpe, 1902 – SW Uganda, E DRCongo, W Rwanda and W Burundi.
C. a. kimbutui (Prigogine, 1955) – Mt Kabobo, in E DRCongo.



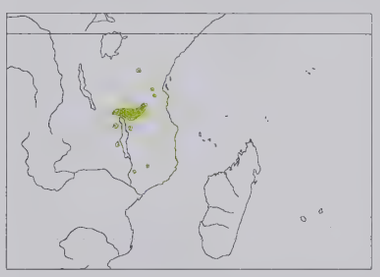
Descriptive notes. 15 cm; 20–26 g. Nominate race resembles *C. isabellae*, but with slightly longer white supercilium, white spot on chin, uniform rufous tail; bill black, legs brown. Sexes similar. Juvenile is like adult, but with vague orange-buff supercilium, underparts mottled dark brown. Race *kimbutui* is more olive above than nominate, with face and head blacker, supercilium indistinct, tail dark brown. Voice. Song, delivered throughout day for several months, a curious melancholy loud trilled piping sounding like a squeaky gate, "wer ler we wer ler we wiiii" or "triiiii-yuu triiii triiii yuu", rising and falling and with metallic quality, very like that of *C. isabellae*. Calls include frog-like triple grunt, "cop-cop-cop", accompanied by tail-raising, short soft "whit" in flight, and high descending "siiiiip" in anxiety.
Habitat. Understorey of montane forest, including secondary growth with open understorey of bracken, wild celery, nettle, brambles, lichen-shrouded dead trunks, vine tangles and sapling clumps; commonly near streams or swampy ground (in wet forests throughout understorey, but in dry ones only near water). Mainly 1660–2390 m; reaching 4300 m, at upper limit of groundsel (*Senecio*), in Ruwenzoris. Favours stands of tree-ferns (*Cyathea*), often on scree slopes, and ranges through the bamboo and giant-heath zones above tree-line.
Food and Feeding. Insects, such as beetles, ants, termites, hemipteran bugs, hymenopterans and caterpillars; small millipedes. Forages on and near ground on moss-clad logs and in low undergrowth. Joins mixed-species flocks; sometimes follows army-ant swarms, but in Nyungwe Forest (Rwanda) shows no interest in them.
Breeding. Possibly all year except Jun–Aug dry season; evidence of Jan, Apr, Oct and Dec in Rwanda, Oct–Nov, Mar and May in DRCongo, and eggs in Jan and Oct in Uganda. Territory size in Rwanda estimated at less than 1 ha. Nest a neat cup of rootlets and tendrils built on growing moss, in one case c. 1 m off ground in moss mass on trunk of giant *Senecio*, in another c. 1 m off ground in dead branches by stream, in a third 1·3 m from ground on mossy ledge in road cutting. Eggs (two clutches documented) 2, one clutch pale blue with weak brown spots, other grey-green and heavily flecked and stippled, giving overall pale brown appearance. No other information.
Movements. Mainly sedentary. Some altitudinal migration or juvenile dispersal may occur in Kivu region of DRCongo; recorded in dry regenerating forest on the lava plain N of L Kivu in Jun.
Status and Conservation. Not globally threatened. Restricted-range species: present in Albertine Rift Mountains EBA. Common to abundant, particularly along streamsides.
Bibliography. Beresford (2003), Britton (1980), Butynski & Kalina (1989), Chapin (1953), Dowsett (1990), Keith *et al.* (1992), Lippens & Wille (1976), Masterson (1981), Oatley (1998), Prigogine (1960, 1971), Sinclair & Ryan (2003), Stattersfield *et al.* (1998), Stevenson & Fanshawe (2002), Vande weghe (1988).

217. Olive-flanked Robin-chat

Cossypha anomala

French: Cossyphe à flancs olive **German**: Olivflankenrötel **Spanish**: Cosifa Anómala
Other common names: Olive-flanked Robin; Mbulu Robin-chat (*mbuluensis*); MacClounie's Robin-chat (*macclounii*); Malawi Robin-chat (nominate)

Taxonomy. *Callene anomala* Shelley, 1893, Mulanje Plateau, Malawi.
Recently placed by several authorities in genus *Dryocichloides*; also sometimes placed in *Alethe*. Geographical variation well marked, and review of species limits warranted; nominate race distinctive and possibly better treated as separate species, but approached in certain features by *macclounii*. Vocally, *mbuluensis* may be most distinctive, and it does not respond to tape playback of voice of S Tanzanian *grotei*, which is also rather distinctive morphologically. Proposed race *gurue* (Mt Namuli, in N Mozambique) synonymized with nominate. Four subspecies recognized.
Subspecies and Distribution.
C. a. mbuluensis (C. H. B. Grant & Mackworth-Praed, 1937) – Mbulu Highlands, in NC Tanzania.
C. a. grotei (Reichenow, 1932) – E & S Tanzania.
C. a. macclounii (Shelley, 1903) – SW Tanzania, N Malawi and adjacent NE Zambia.
C. a. anomala (Shelley, 1893) – Mt Mulanje (S Malawi) and Mt Namuli (N Mozambique).



Descriptive notes. 14–15 cm; 22–28 g. Nominate race is olive-brown from crown to mid-back and darker wings, shading to chestnut rump and chestnut-brown tail; grey forehead and preocular supercilium, black lores and cheek; off-white chin to throat, grey breast and belly, shading buffier on flanks and whitish on lower mid-belly; bill black, legs grey-brown. Sexes similar. Juvenile is like adult, but buff-speckled above and below. Race *grotei* is much more strongly contrasting, with prominent white supercilium and throat, blacker head, face and upperparts, greyer upper flanks, more rufous lower flanks and vent, bright rufous rump and tail, latter with blackish central feathers and terminal band; *mbuluensis* differs from previous in having blackish of cheek extending to sides of throat and breast (small white bib), shading to dark grey on lower flanks; *macclounii* differs in being tinged dull olive above, with rump and tail like nominate. Voice. Song a series of a standard phrase consisting of 4–7 simple high whistles, "one-three-four, one-three-four-five" or "er sii hurry per yoh", first and last few notes descending, third from last usually highest, but much geographical variation; race *mbuluensis* sings with 2-note whistle, "fi-fúúúúr". Call a loud harsh irregular "bairk", "har", "chop" or "wump", as contact and alarm.
Habitat. Montane evergreen forest, forest patches, edges and adjacent gardens, at 1000–2600 m; mainly above 1900 m in Ulugurus but at 1400–1830 m in Udzungwa Mts, in Tanzania. Favours areas with dense understorey of nettles or Acanthaceae, streamsides with tree-ferns (*Cyathea*) and steep wet ravines; less common in drier gallery forest on plateaux, where confined to areas with dense understorey.
Food and Feeding. Only insects reported. Forages mainly on ground or on logs, but frequently ascends into middle strata to glean on creeper-laden and moss-clad tree trunks; also sallies after flying insects. Generally shy, remaining hidden within vegetation, but ventures up to 100 m into open glades in twilight. Regular at ant swarms, but occurs in forest patches that lack them.
Breeding. Jul and Oct–Dec in Tanzania; Nov–Jan on Nyika Plateau, in Malawi. Territory size 0·25–2·5 ha (depending on habitat quality) on Nyika Plateau. Nest an open cup of dead leaves and moss, lined with fibres, on bankside or up to 1·3 m above ground in hollow top of stump or tree or on horizontal stem in thicket. Eggs 2, creamy-brown with darker brown mottling. No information on incubation and nestling periods. Of 37 pairs on Nyika Plateau, 16 (43%) successful, productivity 0·7 young per pair or 1·7 young per successful pair. Average annual mortality 14% for males, 43% for females.
Movements. Sedentary on Nyika Plateau, in Malawi; retrapped birds moved 0–620 m from initial capture site in same forest patch. Elsewhere probably sedentary or mainly so, but recorded at 900 m in dry season (Aug) on Mt Mulanje (Malawi), suggesting minor altitudinal movement.
Status and Conservation. Not globally threatened. Abundant on Mt Mulanje. On Nyika Plateau, abundance related to habitat, with lower densities where relatively dry conditions near and on ridges create sparser undergrowth. Elsewhere in range relatively scarce; density in Udzungwa Mts,

On following pages: 218. Cape Robin-chat (*Cossypha caffra*); 219. Blue-shouldered Robin-chat (*Cossypha cyanocampter*); 220. Rüppell's Robin-chat (*Cossypha semirufa*); 221. White-browed Robin-chat (*Cossypha heuglini*); 222. Rufous-capped Robin-chat (*Cossypha natalensis*); 223. Chorister Robin-chat (*Cossypha dichroa*); 224. White-headed Robin-chat (*Cossypha heinrichi*); 225. Snowy-crowned Robin-chat (*Cossypha niveicapilla*); 226. White-crowned Robin-chat (*Cossypha albicapillus*); 227. White-throated Robin-chat (*Cossypha humeralis*); 228. Angola Cave-chat (*Xenocopsychus ansorgei*).

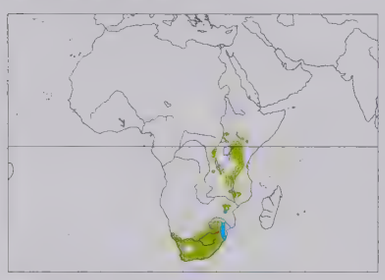
in Tanzania, 15 pairs or 45 individuals/km², although commoner at nearby (50 km distant) forest patch 200–500 m higher in altitude.
Bibliography. Belcher (1925), Benson & Benson (1977), Beresford (2003), Britton (1980), Dowsett (1985b), Dowsett & Dowsett-Lemaire (1984, 1986), Dowsett-Lemaire (1983, 1985), Jensen & Brøgger-Jensen (1992), Keith *et al.* (1992), Moyer (1993), Oatley (1998), Sinclair & Ryan (2003), Svendsen & Hansen (1995), Vande weghe (1988), van der Willigen & Lovett (1981), Willis (1985), Zimmerman *et al.* (1996).

218. Cape Robin-chat

Cossypha caffra

French: Cossyphe du Cap **German**: Kaprötel **Spanish**: Cosifa Cafre
Other common names: Robin Chat

Taxonomy. *Motacilla caffra* Linnaeus, 1771, Cape of Good Hope, South Africa.
Proposed race *drakensbergi* (NE South Africa) synonymized with nominate. Four subspecies recognized.
Subspecies and Distribution.
C. c. iolaema Reichenow, 1900 – S Sudan S to Malawi and N Mozambique.
C. c. kivuensis Schouteden, 1937 – SW Uganda and E DRCongo.
C. c. namaquensis W. L. Sclater, 1911 – S Namibia and W & C South Africa (Northern Cape E to Free State).
C. c. caffra (Linnaeus, 1771) – Zimbabwe and N, E & S South Africa (S to Western Cape), including Swaziland and Lesotho.



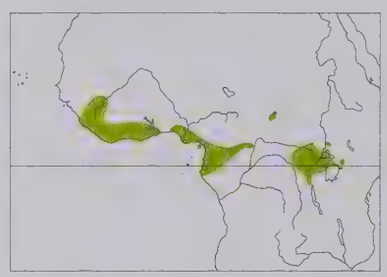
Descriptive notes. 16–17 cm; 25–34 g. Nominate race is olive-grey from crown to lower back, darker wings (with white post-carpal edge), chestnut rump and tail, latter with grey-brown central feathers; broad white supercilium, blackish mask; white narrow moustachial line bordering orange-white chin with dark whisker mark, shading to orange-buff breast, grey breast side and flanks, whitish belly and orange-buff vent and undertail-coverts; bill and legs brownish to blackish. Sexes similar. Juvenile is spotted buff above, scaled dusky below. Race *namaquensis* is like nominate but larger, with stronger supercilium; *iolaema* is darker above and below than nominate; *kivuensis* similar to previous but more richly coloured below. Voice. Song, by both sexes (female normally shorter muted versions), a series of melodious whistled phrases, repetitive, halting and fairly high, most starting with soft, downslurred whistle, "tiiu-chiio chiio-tu-tiio tiio-tiio-tu-wiiuu"; delivery faster in N races than in S ones; mimicry variable in extent individually, non-existent to extensive, with up to 20 bird species copied. Main call a highly distinctive "wurdedur" or "garg-ga-garg" or "turr-da-da", sometimes simply "garg", and somewhat faster with a few more syllables N of R Zambezi, used in alarm, contact and at roost; in anxiety a soft descending "piiiiuuu", and in distress a quiet ticking.
Habitat. Edges of montane forest, typically bracken-briar and similar ecotonal vegetation adjacent to forest patches, with little penetration of forest interior; also highland tea and coffee plantations, woodland, gardens, giant heath, edges of bamboo and forested ravines. S of R Limpopo more generalized, found in any habitat with dense stands over 2 m in height, and including low-lying woodland, bushveld, fynbos, exotic plantations, willow belts, large gardens and parks; in dry SW areas, largely confined to riparian vegetation and vicinity of human settlements. Occurs at 1500–3400 m in E Africa (occasionally down to 500 m in Tanzania), above 1600 m in Sudan, 1700–4000 m in DRCongo, above 1800 m in Zambia, above 1530 m in Malawi; mainly 1400–2200 m in E Zimbabwe, above 1220 m C Mozambique, but in South Africa from sea-level (in winter) to *Leucosidea* scrub in alpine grassland at 3000 m.
Food and Feeding. Wide variety of animal and vegetable food recorded, with opportunist use of local resource, e.g. caterpillars often taken when abundant in canopy, and termites often dominant in diet in acacia woodland; lizards and small frogs also recorded. In South Africa, of 17 stomachs and 87 faecal samples (mainly from KwaZulu-Natal), 88% held ants, 67% beetles (Coccinellidae, Curculionidae, Melolonthidae, Scarabaeidae, Staphylinidae, Tenebrionidae), 65% fruit, 46% moths and caterpillars, 35% termites, 17% parasitic wasps, 15% bugs (Naucoridae, Tingidae), 12% spiders, 10% orthopterans, 9% flies (Asilidae, Tabanidae), and 4% centipedes and pseudoscorpions; stomachs of 23 birds from throughout year (from Free State) held, by number, 37% seeds, 30% berries, 18% ants, 10% beetles, 2% plant parts, 1% unidentified larvae, 1% flies and 1% lepidopterans and bugs. Fruits consumed in Western Cape include *Asparagus*, *Celtis*, *Cestrum*, *Ficus*, *Halleria*, *Hedychium*, *Ilex*, *Kiggelaria*, *Maytenus*, *Morus*, *Olea*, *Physalis*, *Psidium*, *Rhus*, *Rubus* and *Solanum*, with seeds (including attached oil-rich funicles) of exotic *Acacia cyclops*. Forages mainly on ground under shrubs or in open, often in sight of mate, usually disturbing leaf litter by hopping through, rather than by using bill; perches low on branch or rock and sallies to ground and in air after prey; also gleans from foliage, twigs and trunks, and ascends to canopy for caterpillars. Follows army-ant swarms. On SW Cape coast, forages for crustacea and kelp-fly larvae in intertidal zone. Visits birdtables, taking foods such as cheese and bonemeal; raids domestic pets' food-bowls, and recorded as entering house to peck butter.
Breeding. Jan and Mar in Sudan; breeding-condition birds May and Jul in DRCongo; all year in E Africa, with peak in long rains and smaller peak in short rains; Oct–Jan in Zambia and Malawi; Sept–Dec (peak Oct-Nov) in Zimbabwe; breeding activity recorded in every month in South Africa, with laying peaks Aug–Sept in winter-rainfall areas and Oct–Nov in summer-rainfall areas; two broods, sometimes three, in South Africa. Territory in South Africa (maintained throughout year if not migratory) 0·05–0·75 ha, size varying with habitat. Nest construction 4–14 days, sometimes longer, an open bulky cup (with ramp at entry point in one third of cases) made of twigs, bark, dead leaves, grass stems, fronds, rootlets, seed pods and moss, lined with fine rootlets, bark, fine grass heads and/or animal hair; placed mostly in recess in earth bank, top of hollow stump, niche in tree trunk, amid shrubbery branches or in suspended flood debris along watercourse, in gardens sometimes in artificial site (e.g. old pot, box, hanging basket, roll of wire); from sample of more than 1000 nests, about one third placed on ground (but these less detectable than those above ground), mean height of off-ground nests 1·15 m, highest 3·7 m; occasional reuse of sites recorded. Eggs 2–3 (mean 2·7 for 69 clutches), white, cream, buff, pale green or pale blue, with pinkish, russet and chocolate freckles and spots; incubation period 13–19 days, mainly 16 days; chicks brooded by female for 5–11 days (period dependent on weather), nestling period 16·5–18 days (sometimes only 15 days), young barely able to fly when leave nest; post-fledging dependency at least 32–38 days, in rare cases 50 days. Brood parasitism by Red-chested Cuckoo (*Cuculus solitarius*) 2·46% of 1503 nests throughout S Africa, locally much higher rate, 16–22% of nests in NE South Africa. In acacia savanna in KwaZulu-Natal, ten birds fledged from 19 nests over two years, representing 21% success for eggs laid; main cause of failure predation.
Movements. Altitudinal migrant in dry winter season in many parts of range, especially S from Malawi, but thought normally not to move very far; e.g. mainly resident even at high altitudes in Drakensberg Mts and in Bvumba Highlands of E Zimbabwe, and no evidence of substantial movement despite considerable ringing data; only rare winter visitor to extreme S Mozambique.
Status and Conservation. Not globally threatened. Common and widespread in appropriate habitat throughout range; particularly common in e.g. Nairobi suburbs, in Kenya. In South Africa, range has expanded over the last century.
Bibliography. Belcher (1925), Benson (1944), Benson & Benson (1977), Beresford (2003), Bonde (1993), Britton (1980), Brown & Barnes (1984), Cave & MacDonald (1955), Chapin (1953), Clancey (1996), Cyrus (1989), Dean (1987), Earlé (1981), Ferguson *et al.* (2002), Harrison *et al.* (1997), Harwin *et al.* (1994), Irwin (1957b, 1981), Keith *et al.* (1992), Kopij (2003), Kuiper & Cherry (2002), Lippens & Wille (1976), Maclean (1993), Nikolaus (1987), Oatley (1966, 1970b, 1998), Parker (1999), Payne & Payne (1967), Prigogine (1971), Rowan (1969), Sinclair (1984), Sinclair & Ryan (2003), Skead (1966), van Someren (1956), Stevenson & Fanshawe (2002), Steyn (1996), Swynnerton (1907), Tarboton (2001), Tarboton *et al.* (1987), Zimmerman *et al.* (1996).

219. Blue-shouldered Robin-chat

Cossypha cyanocampter

French: Cossyphe à ailes bleues **German**: Blauschulterrötel **Spanish**: Cosifa Aliazul

Taxonomy. *B.(essonornis) cyanocampter* Bonaparte, 1850, "Patria ignota" = Dabokrom, Ghana.
Two subspecies recognized.
Subspecies and Distribution.
C. c. cyanocampter (Bonaparte, 1850) – SW Mali, E Guinea and Sierra Leone E to Gabon.
C. c. barttelotti Shelley, 1890 – N & SW Central African Republic, and NE DRCongo and S Sudan S to Uganda and W Kenya.



Descriptive notes. 15–16 cm; 28–32 g. Nominate race has blackish head with long white supercilium, dark olive-brown mantle and neck side to lower back, slightly browner wings with shiny blue lesser and median wing-coverts, orange-rufous rump and tail, latter with central feathers blackish and others partly black on outer webs; orange-rufous below, strongest on breast, palest on belly; bill black, legs brownish-grey. Sexes similar. Juvenile has crown and wing-coverts spotted rufous, flight-feathers edged dull buff. Race *barttelotti* is darker above, marginally paler below, breast less orange. Voice. Song, mainly during rainy season (can continue after nightfall), a sweet, rich mix of leisurely whistles with much mimicry of calls of other birds, mainly cuckoos (Cuculidae), raptors and African Green-pigeon (*Treron calva*), each note usually repeated several times, very like other imitative congeners but distinguished by frequent alternation of loud and soft passages: "chreek chreek, wukeri-tu-tu-tu, chick-chick-chuck-chuck, chi-chu, whi-whu whi-whu, wikiyu wikiyu, tootoo-wii-wii, wiitu-wiitu-wiitu". Call a loud "trurr", this presumably the dry croaking rattle often preceding song in Ituri (DRCongo), thought by observer to be imitation of a frog.
Habitat. Undergrowth of primary forest, especially dense edge growth and along streams, also tangled thickets and *Afromomum* understorey inside secondary forest, gallery forest, forested ravines, seasonal swamp-forest and coastal thickets; generally in lowlands, 0–1500 m in Liberia, but to at least 1700 m in DRCongo, 2000 m in Sudan and E Africa (1000–2000 m in Kenya). In Gabon reported as restricted to secondary forest, and occurs also in bushy fallow cultivations, along pathways, and in dense vegetation near habitation. Not known to venture into canopy, even when singing. Keeps always to dense cover.
Food and Feeding. Invertebrates, including ants, termites, beetles, caterpillars, moths, cicadas, grasshoppers, bugs, spiders and millipedes; fruit apparently rarely, if ever, taken. Forages on or near ground in dense cover.
Breeding. Recorded in every month across range, with apparent peaks in Mar–Aug; breeding condition Aug–Sept in Liberia and May in Nigeria; Mar, July and Oct in Cameroon; Jan in Gabon; Oct in Sudan; Feb–Sept and Nov–Dec in DRCongo; nestlings in May in Uganda. Territory size reportedly 3–6 ha in secondary forest, but this larger than for congeners and one singing male confined itself over 4 days to area of c. 1 ha. Nest little known; one in Cameroon a loose bulky construction of twigs, dead leaves, grass and moss with thick moss lining, one in Gabon thick and bulky and lined with stalks and rootlets; in Uganda, a neat open cup of green grass fibres, growing moss, twigs, rotting leaves and grass stems, lined with rootlets and placed 0·5–1 m above ground on mossy log, amid dense wild ginger *Afromomum* or in pollard stump head, but one was a cup of grass and green moss, 0·5 m off ground on decaying log, woven into growing moss and well shaded in dense tangle of *Acanthus pubescens* shrubs and *Mimulopsis* vines. Eggs 2, blue-green to olive-green with brown and/or mauve markings. No further information. A captive male continued to breed until at least 24 years of age.
Movements. Sedentary; some movement assumed, as individual in Gabon reported imitating *Luscinia megarhynchos* (latter unrecorded in Gabon).
Status and Conservation. Not globally threatened. Generally frequent to locally common. Density 7–8 pairs/km² in secondary forest in Gabon. Fairly common at low elevations in Itombwe Mts, in E DRCongo, but absent from large tracts of apparently suitable habitat in DRCongo. Rare in Korup National Park, in Cameroon. Uncommon in Sudan (Imatong Mts).
Bibliography. Bannerman (1953), Beresford (2003), Borrow & Demey (2001), Brosset & Érard (1986), Chapin (1953), Colston & Curry-Lindahl (1986), Cunningham-van Someren & Schifter (1981), Curio (1989), Gatter (1997), Keith & Gunn (1971), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Mann (1985), Nikolaus (1987), Oatley (1998), Prigogine (1971), Rodewald *et al.* (1994), Sinclair & Ryan (2003), Skorupa (1982b), Thiollay (1985), Vande weghe (1988), Zimmerman (1972), Zimmerman *et al.* (1996).

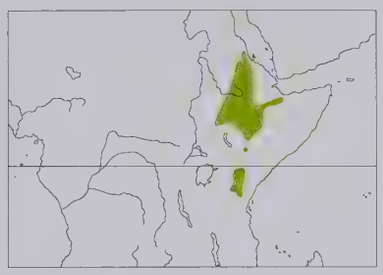
220. Rüppell's Robin-chat

Cossypha semirufa

French: Cossyphe de Rüppell **German**: Braunrückenrötel **Spanish**: Cosifa de Rüppell
Other common names: Lesser/Black-tailed Robin-chat

Taxonomy. *Petrocincla semirufa* Rüppell, 1840, Abyssinia.

Three subspecies recognized.
Subspecies and Distribution.
C. s. semirufa (Rüppell, 1840) – W Eritrea and S & W Ethiopia S to SE Sudan and N Kenya.
C. s. donaldsoni Sharpe, 1895 – E Ethiopia and adjacent NW Somalia.
C. s. intercedens (Cabanis, 1878) – C & SE Kenya and N Tanzania.



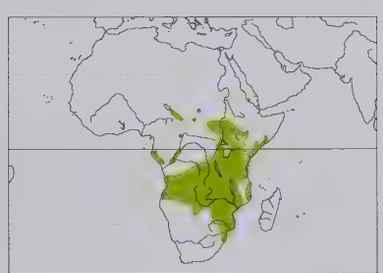
Descriptive notes. 18–19 cm; 22–31 g. Nominate race has black head with long, broad white supercilium, olive-brown mantle to lower back and scapulars, dark brown wings, orange-rufous rump to tail, latter with central feathers blackish and others partly black on outer webs; orange-rufous below, paler on mid-belly; bill black, legs brownish-grey. Differs from very similar *C. heuglini* in smaller size, darker wings and black central tail. Sexes similar. Juvenile is scaled blackish above and below, with no supercilium. Race *donaldsoni* has darker upperparts with slight grey-blue cast, almost full rufous hindcollar; *intercedens* is like previous but larger, with darker, chestnut rump and outer tail. Voice. Highly vocal in evening, may sing continuously from cover. Song powerful and beautiful, mixing rich whistlings and perfectly mimicked calls and phrases (including from tunes whistled by people), and with persistently repeated 3-note phrase, "rrri-pru-ru"; very like song of *C. natalensis* but less slurred. Call ("song-call") a series of low "huu" notes ending with loud "hiiyo" (last syllable with an octave drop); guttural "rack-k-k-k" rattle in alarm.
Habitat. Montane and submontane evergreen forest and edge, including riverine thickets and tangles, wooded dongas, pockets of bush, country and suburban gardens with dense shrubbery, commonly keeping to edge habitats but sometimes penetrating forest interior; in E Africa at 1400–2300 m. In Ethiopia occupies juniper and *Podocarpus* forest and edge, 1000–3200 m. Found in forest patches with thick tangles of subcanopy growth as small as 0·4 ha (no evidence if singly or pairs). Often emerges to feed by trails and roadsides in twilight or after rain.
Food and Feeding. Only insects recorded, including beetles, moths, caterpillars, mantises and grasshoppers. Attends driver-ant swarms; sometimes associates with smaller mammals, including small forest antelopes such as suni (*Nesotragus moschatus*), catching prey disturbed by their passage.
Breeding. Mar–Aug in Ethiopia; Mar–Jun (long rains) and one record Dec in Kenya. Nest an open cup of dead twigs, leaf skeletons, rootlets and moss, with base of dead leaves and twigs, lined with fibres and moss, placed 1–2·5 m off ground in shrub, climbers, stump, tree hole, ledge, vegetable debris stranded in bushtop, hanging basket in garden. Eggs 2–3 (mostly 2), olive-green or olive-brown with some darker speckling; incubation period 12–13 days; nestling period 15–16 days; post-fledging dependence probably at least 3–4 weeks. Brood parasitism by Red-chested Cuckoo (*Cuculus solitarius*) common in Kenya Highlands.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Generally common and locally abundant throughout range. Especially common in forests on Chyulu Hills, in Kenya. In Tanzania, present in Arusha National Park.
Bibliography. Beesley (1973), Benson (1946a), Britton (1980), Brooks *et al.* (1998), Brown & Britton (1980), Cheesman & Sclater (1935), Keith *et al.* (1992), Oatley (1998), Safford *et al.* (1993), Sinclair & Ryan (2003), Smith (1957), van Someren (1956), Urban (1975), Zimmerman *et al.* (1996).

221. White-browed Robin-chat

Cossypha heuglini

French: Cossyphe de Heuglin **German**: Weißbrauenrötel **Spanish**: Cosifa de Heuglin
Other common names: Heuglin's Robin-chat

Taxonomy. *Cossypha heuglini* Hartlaub, 1866, "Keren"; error = Wau, Bahr el Ghazal, Sudan.
Proposed race *pallidior* (Chari Valley, in Chad) synonymized with nominate and *euronota* (S Zimbabwe S to NE South Africa) with *intermedia*. Three subspecies recognized.
Subspecies and Distribution.
C. h. subrufescens Bocage, 1869 – Gabon S to W Angola.
C. h. heuglini Hartlaub, 1866 – S Chad, W & S Sudan and N & SW Central African Republic E to Ethiopia, S to E Angola, N Botswana, Zimbabwe and N South Africa.
C. h. intermedia (Cabanis, 1868) – S Somalia S along coastal ro NE South Africa (S to KwaZulu-Natal).



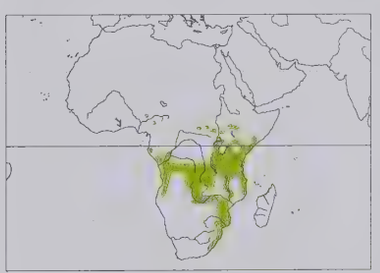
Descriptive notes. 19–20 cm; 29–44 g. Nominate race has blackish head with long white supercilium, narrow rufous hindcollar linking to all-rufous underparts; dark olive grey-brown mantle to lower back and scapulars, dull grey wings, rufous rump to tail, latter with central feathers olive and others partly olive on outer webs; bill black, legs brownish-grey. Sexes similar, female rather smaller than male. Juvenile is scaled black above and below, with no supercilium. Race *subrufescens* has central tail black; *intermedia* is like nominate but smaller. Voice. Song (by male) distinctive, an extended series of standard phrases repeated 2–5 times, starting quietly and peaking very loudly, each phrase of 4–5 notes, e.g. "trickle-chok-twee", or "wuut wuut chero-chiii"; at peak, female interpolates decrescendoing "tliiiu"or "tsiiii" between each of last 2–3 phrases, although this can be sung by male if female absent; rarely, mimicry incorporated. Mimicry much more frequent in subsong and calls; in alarm, the "tsreck-tsreck-tsreck" rattle can be supplemented with alarm or mobbing calls of other birds, e.g. "tru-wick" of Common Bulbul (*Pycnonotus barbatus*). Other calls include, for contact, a fast loud "pit-porliii" or "chiiritter-porliii" and variants.
Habitat. Evergreen forest edge and thickets (e.g. termitaria thickets), latter especially within riverine forest with discontinuous canopy and dense riverine thickets; also in acacia woodland, fringing vegetation (e.g. *Phragmites* reedbeds) of lakes and lake islands, especially with shade, disturbed habitats with patches of rank growth in more open areas, edges of miombo woodland. Needs strong cover of evergreen shrubs. From sea-level to 2200 m in E Africa, 2130 m in Sudan (Jebel Marra), 1800 m in Ethiopia, 2300 m in DRCongo, 1500 m in Zimbabwe and Malawi (rarely, to 2040 m), but to only 1000 m S of R Limpopo. Readily establishes itself in gardens, parks and vestigial stands of natural habitat in towns and suburbs. At twilight emerges from cover to forage on open ground.
Food and Feeding. Mainly insects, particularly ants and beetles, but also fruit. Of 19 stomachs and nine faecal samples from across range, 86% held ants (Ponerinae, Dorylinae, Camponotinae, Myrmecinae), 75% beetles (Anthicidae, Buprestidae, Carabidae, Coccinellidae, Cocujidae, Curculionidae, Lagriidae, Lampyridae, Tenebrionidae), 32% caterpillars and moths, 25% unidentified fruit, 21% termites, 21% bugs (Anthocoridae, Reduviidae), 14% grasshoppers, 14% hunting wasps (Ichneumonidae), 11% millipedes, 7% woodlice, 7% flies, 4% spiders and 4% small frogs. Forages mainly on ground, progressing in rapid bounding hops with frequent pauses, and flipping leaf litter with bill; catches termites on wing in sally from cover.
Breeding. Coincides with two local rainy seasons in E Africa, in Apr–May (43% of clutches) and Nov–Jan (29%), but in most or all months in some equatorial regions, including around L Victoria, in Kenya; breeding-conditon male Apr in Gabon; Oct–Jan in DRCongo; Jan–Apr and Aug–Nov in Rwanda; Aug–Sept in Sudan, and Jun (and perhaps Dec) in Ethiopia; mainly Sept–Feb (most records Oct–Nov) S of 10° S; sometimes double-brooded. Territory c. 1 ha, variable (presumably with habitat quality), 0·3–2 ha recorded in S. Nest, built in less than a week, an open cup based on dead leaves and coarse twigs, made of moss, twigs, rootlets and/or grass stems, elephant grass (*Pennisetum*) where available, lined with leaf skeletons and other fine material, placed in crevice or hole in tree, on coppiced stump, amid exposed streamside roots, or in branches of shrub or sapling; average height above ground 1·6 m, highest 8 m in bamboo clump, fewer than 4% on ground; old nest sometimes refurbished and reused. Eggs 2, rarely 3, exceptionally 1, milky-brown, buffy-olive, cream or bluish, sometimes with reddish-brown markings, rarely plain blue; incubation period 12–13 days in Kenya, 14–15 days in KwaZulu-Natal, but up to 17 days recorded; nestling period 13–17 days (15 days probably usual); post-fledging dependence probably 3–4 weeks. Brood parasitism by Red-chested Cuckoo (*Cuculus solitarius*) occasional. In KwaZulu-Natal study, only four of 15 nests fledged offspring; nest predation, notably by boomslangs and cats, common. Adult annual survival 83·3 % in Malawi.
Movements. Sedentary; in Kenya, individuals may appear in drier areas after rains.
Status and Conservation. Not globally threatened. The most widely distributed and least habitat-restricted robin-chat; very common throughout range, except at fringes; e.g. very uncommon in S Somalia, local and uncommon in S Mozambique, and rare to uncommon and locally common in WC Africa (where distribution patchy). Density up to 3 birds/ha in S Africa. Found in Manovo-Gounda-Saint Floris National Park, in Central African Republic. In Tanzania, recorded in Serengeti, Lake Manyara and Tarangire National Parks. In South Africa, has expanded range S in KwaZulu-Natal since 1950s.
Bibliography. Ash & Miskell (1998), Bannerman (1953), Benson (1946a), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1980), Brown & Britton (1980), Butler (1905, 1908), Cave & MacDonald (1955), Chapin (1953), Day (1987), Dowsett & Prigogine (1974), Farkas (1973a), Ferguson *et al.* (2002), Hanmer (1989b), Harcus (1977a), Harrison *et al.* (1997), Hultsch (1983), Hultsch & Todt (1984), Irwin (1981), Keith *et al.* (1992), Koen (1988), Kuiper & Cherry (2002), Lewis & Pomeroy (1989), Lippens & Wille (1976), Lorber (1984), Maclean (1993), Nikolaus (1987), Oatley (1970c, 1998), Parker (1999), Payne & Payne (1967), Peach *et al.* (2001), Sclater & Mackworth-Praed (1918), Sinclair (1984), Sinclair & Ryan (2003), van Someren (1956), Swynnerton (1907, 1908), Tarboton (2001), Traylor (1965), Vande weghe (1988), Vincent (1935b), Wickler (1974), Wood (1989), Zapletal (1987), Zimmerman *et al.* (1996).

222. Rufous-capped Robin-chat

Cossypha natalensis

French: Cossyphe à calotte rousse **German**: Natalrötel **Spanish**: Cosifa de Natal
Other common names: Red-capped Robin-chat; Natal Robin-chat (nominate)

Taxonomy. *Cossypha natalensis* A. Smith, 1840, neighbourhood of Port Natal [= Durban], South Africa.
Several records of hybridization with *C. dichroa* in E South Africa; hybrids described as *C. haagneri*. Additional races have been described, but unequivocal diagnosis of these generally problematic, and further complicated by imperfectly understood migratory regimes. Three subspecies recognized.
Subspecies and Distribution.
C. n. larischi Meise, 1958 – Nigeria S to N Angola.
C. n. intensa Mearns, 1913 – SE Central African Republic, S Sudan, SW Ethiopia and S Somalia S to E Angola and NE South Africa.
C. n. natalensis A. Smith, 1840 – E South Africa (KwaZulu-Natal S to Eastern Cape).



Descriptive notes. 16–17 cm; 24–40 g. Distinctive, having orange-rufous face with beady black eye. Nominate race has crown to nape olive-rufous, back and scapulars dark blue-grey, wings dark brown with blue-grey fringes, rump olive-rufous, shading to rufous tail, latter with central feathers black; face, neck side and underparts rich rufous; bill black, legs pinkish-grey. Sexes similar. Juvenile is blackish-grey with rufous spotting above, rufous with dusky scaling below. Race *larischi* is darker than nominate, especially on cap; *intensa* is paler rufous, less olive-brown above. Voice. Song during breeding ■ rich medley of original notes, very human whistling and mimicry of other birds, closely resembling songs of *C. dichroa* and *C. semirufa* but often distinctively slurred, and usually delivered from concealed position in undergrowth, "twii tu, twii tu, chwi-witi-tu, tutu-tutu, tii-tu", sometimes continuing for 30 minutes or more; repertoire of individual commonly involves 28–40 imitations, interspersed with "see-saw note". Outside breeding season song quieter and less varied. Calls include mournful "whuh ti-eh"; especially, a monotonously repeated quiet "trriii trrr" or "tiuh-tah" ("see-saw note"; one variant a trilled whistled "too-loo") for contact, sometimes as duet between pair-members or rivals in which one gives first note and other the second note; guttural ratchet call "gurrrr" in alarm and when roosting; may also mimic alarm calls of many other species, e.g. "churr" of Terrestrial Brownbul (*Phyllastrephus terrestris*). Nestlings beg with "sriii" and use this as location call out of nest.
Habitat. Closed lowland and middle-elevation evergreen forest, open deciduous forests in thornbush, dune forest, riverine, ravine and gallery forest, dry *Cryptosepalum* forest, sand forest, littoral thickets (especially with Acanthaceae understorey); in Ethiopia in juniper–*Podocarpus*–olive forest, and in Angola in dense *Brachystegia* woodland, occupying patches of dense undergrowth with shrubs and climbers; also breeds in gardens with good tree and shrub cover. Enters arid country on migration and in non-breeding areas. Reaches 2200 m in E Africa (but mainly below 1500 m), 2000 m in Ethiopia and Sudan, 1670 m in DRCongo, 1220 m in C Mozambique, 1500 m in Zimbabwe and 1530 m in Malawi; S of R Limpopo rarely above 1200 m, and in KwaZulu-Natal usually below 400 m.

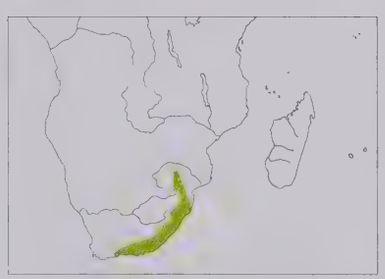
Food and Feeding. Invertebrates and fruit. Of 33 stomachs and 14 faecal samples from across range, 79% held beetles (including Curculionidae, Elateridae and Scarabaeidae), 77% ants, 34% moths (adults and larvae, including Sphingidae), 34% orthopterans, 26% termites, 21% spiders (Attidae, Salticidae), 17% bugs (Fulgoridae, Pentatomidae), 13% wasps, 13% centipedes, 13% fruits (including *Erythroxylon*, *Euclea* and *Halleria*), 6% other insects, 2% isopods, 2% flies and 2% scorpions. Small crab seen taken. Forages mainly on ground, flipping leaf litter and breaking open termitaria on fallen wood or tree boles; catches flying prey with ease. Frequently attends ant swarms, and follows mammals such as moles, mole-rats (*Cryptomys*) and elephant-shrews (*Rhynchocyon cirnei*), and even *Zoothera guttata*, for flushed insects. In middle strata takes fruit and gleans leaves. In twilight emerges on to trails and into glades and gardens.
Breeding. Wet-season breeder throughout range: Jun in Nigeria, Aug in Sudan and Jul in coastal Kenya and Somalia; Oct–Jan in DRCongo, Apr–May in Uganda, Jan and Mar in Rwanda, Oct–Dec in Zanzibar and Nov–Jan in Malawi and Zambia; Aug–Jan, mainly Oct–Dec, in S Africa. Territory (held all year) 0·2–0·8 ha. Nest-building takes 5 days or fewer; nest an open, sometimes bulky cup made chiefly of dead leaves, with some dried twigs, grasses, roots, tendrils, flowerheads, bark, moss and lichen, lined with leaf skeletons, rootlets and fine fibres, placed on hollow stump, in tree cavity or among branches or lianas in forest sites, or in recess or on ledge in gulley or earth bank in deciduous woodland; only 5% on ground, and mean height off ground 1·2 m, highest recorded 3·8 m. Eggs 2–4, mostly 3 (mean of 120 clutches 2·8), in South Africa usually olive-green with brown suffusions, varying from pure chocolate-brown to immaculate olive-green or turquoise-blue; incubation period 13–15 days; female may brood for up to 8 days, nestling period variably reported, 11 days to 17 days; post-fledging dependency probably 4–6 weeks. Occasionally parasitized by Red-chested Cuckoo (*Cuculus solitarius*), 2·5% of 80 nests in S Africa. In 62 clutches, 43% of eggs laid produced fledged young.
Movements. Partial migrant, patterns very poorly understood. Disappears from S Ethiopia and S Sudan in Jun–Oct (can then be common in S Somalia), and from coastal Kenya in Dec–Apr; influx in Dar-es-Salaam area of Tanzania Apr–May and Sept–Oct; considerable movement in Zambia, but patterns unclear. Passage of first-year males, apparently from different source populations, occurs on W shore of L Kivu (E DRCongo) during May. In South Africa, E Zimbabwe and C Mozambique whole populations vacate savanna-thicket and riparian breeding sites at start of dry season for coastal evergreen forests (e.g. Apr–Aug on Mozambique littoral), as well as middle Zambezi Valley, but populations in S coastal lowlands and those of Chizarira National Park, near L Kariba (NW Zimbabwe), sedentary.
Status and Conservation. Not globally threatened. Status in N parts of range in some doubt, as uncertainty over significance of many records (whether referable to residents, passage migrants, or breeding or non-breeding visitors). In Nigeria, fairly common in Nindam Forest Reserve and uncommon in Gashaka-Gumti Reserve; predicted to occur widely in narrow band N of rainforest belt in forest–savanna ecotone, but habitat degradation may already have eliminated the species. In Kenya, commonest ground bird at Gedi, May–Nov, but uncommon in Masai Mara National Park. Common in Malawi and N & E Zimbabwe; abundant in S Mozambique S to NE South Africa, where much the commonest robin-chat; common in Durban and in all towns along KwaZulu-Natal coast.
Bibliography. Ash & Miskell (1998), Baker & Howell (1992), Benson (1946a), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Britton (1971, 1980), Britton & Rathbun (1978), Clancey (1982a, 1996), Dowsett (1989), Dowsett & Prigogine (1974), Edwards (1996a, 1997), Everitt (1964d), Farkas (1969), Ferguson *et al.* (2002), Ginn (1995), Hachfeld (2004b), Harrison *et al.* (1997), Irwin (1981), Johnston-Stewart (1984), Keith *et al.* (1992), Kuiper & Cherry (2002), Lewis & Pomeroy (1989), Lippens & Wille (1976), Maclean (1993), Nikolaus (1987), Oatley (1959, 1966, 1970b, 1998), Pakenham (1979), Parker (1999), Roddis (1964), Sinclair (1984), Sinclair & Ryan (2003), Steyn (1996), Stuart & Gartshore (1986), Swynnerton (1907, 1908), Tarboton (2001), Traylor (1962, 1965), Traylor & Archer (1982), Tree (1996), Wilkinson & Beecroft (1988), Zimmerman *et al.* (1996).

223. Chorister Robin-chat

Cossypha dichroa

French: Cossyphe choriste **German**: Spottrötel **Spanish**: Cosifa Bicolor

Taxonomy. *Muscicapa dichroa* J. F. Gmelin, 1789, South Africa.
Several records of hybridization with *C. natalensis* in Eastern Cape; hybrids described as *C. haagneri*. Two subspecies recognized.
Subspecies and Distribution.
C. d. mimica Clancey, 1981 – N South Africa (E Northern Province).
C. d. dichroa (J. F. Gmelin, 1789) – Mpumalanga and Swaziland S, including E Lesotho, to E Western Cape.



Descriptive notes. 19–20 cm; 38–48 g. Has head (to below eye) to back dark slate-grey (blackest on face), shading to orange-rufous on rump and tail, latter with blackish central feathers, wings dark slate with narrow bluish fringes of flight-feathers and smaller coverts; orange-rufous below, including neck side; bill black, legs pinkish-grey. Sexes similar. Juvenile is blackish with buff mottling above, buff with blackish mottling below, tail as adult; complete adult plumage acquired at 11 weeks. Race *mimica* is smaller than nominate. Voice. Song, given only when breeding, beautiful and powerful, like that of *C. natalensis* but bubbly, rather than slurred, and with much mimicry, commonly of African Emerald Cuckoo (*Chrysococcyx cupreus*) and Black-headed Oriole (*Oriolus larvatus*), but 26 bird species, also humans and dogs, recorded as mimicked. Lone individuals wintering in coastal forest (presumably first-years) often deliver quiet subsong, a throaty twittering warble. Calls include throaty "grirrrr" in alarm and when roosting, and in alarm may also imitate "chuk" of *Turdus olivaceus*; also, most often when with fledged young, a rather plaintive, often monotonously repeated "toy-toy", varying to "toy-toy-toy", "piip-borrow", "piip-booo" and "tweedle-dee", as contact. Fledglings have penetrating "chip" location call.
Habitat. Breeds in montane evergreen forest at 1400–1800 m, generally above 1700 m, in N of range; down to coastal forest at sea-level in S. Prime habitat is moist mist-belt forest, but absent from sand forest and, usually, from riverine forest in woodland. Where dry deciduous woodland intergrades with higher evergreen formations, may enter former in winter; in Lesotho and N South Africa sometimes in *Leucosidea sericea* woodland. Enters gardens in winter when immediately adjacent to forest. Uses canopy more extensively than do congeners.
Food and Feeding. Primarily insects, also fruit. Of eleven stomachs and 33 faecal samples from N & E of range, 73% held beetles, 61% ants, 57% fruits (*Asparagus*, *Burchellia*, *Celtis*, *Kiggelaria*, *Maytenus*, *Scolopia*, *Scutia*, *Solanum*, *Vepris*, *Xymalos*, and exotic *Hedychium*, *Lantana*, *Psidium*, *Rhus* and *Rubus*), 34% moths and caterpillars, 16% centipedes and millipedes, 9% orthopterans, 9% plant bugs and assassin bugs, 9% flies, 9% woodlice, 7% termites, 5% spiders, 5% other arachnids, 2% wasps, 2% other insects. Earthworms and ticks also taken; ticks once picked from a bushbuck (*Tragelaphus scriptus*). Exploitation of local abundances of prey indicated by stomach with 59 caterpillars and another with 79 driver ants. Some of fruit in diet is taken from orchards and ornamental shrubs in gardens and parks adjacent to forest in dry season, Apr–Sept; in Oct–May forages mainly in middle strata and lower canopy of forest. Follows ant swarms and mole-rats (*Cryptomys*) in winter to snatch invertebrates disturbed by their activities. Emerges at dusk to feed in open glades.
Breeding. Oct–Dec, with 70% of clutches laid Nov; slightly later peak in W of range. Territory size in one case 1·2 ha. Nest an open cup, sometimes of a single material, sometimes involving leaf skeletons, roots, grass, sedges, moss, dead lichen, etc., typically dark-coloured, most often placed in rot-hole in tree trunk, also in hollow top of limb, cleft in trunk, behind loose bark, or in recess in bank; mean height above ground 4·9 m, range 1·5–12·5 m. Eggs 3 (records of 2 possibly of incomplete clutches), plain glossy blue, blue-green, olive-green or brown, sometimes densely suffused with darker markings; incubation period 15–19 days; nestling period 14 days, with chicks brooded for up to 6 days; post-fledging dependence up to 6 weeks. Rarely parasitized by Red-chested Cuckoo (*Cuculus solitarius*). In 24 clutches, 69% of eggs hatched; in 12 clutches, 31% of eggs laid produced fledged young. Annual adult survival rate 87% for males and 70% for females. Oldest known individual at least 26 years.
Movements. Sedentary at lower levels. Elsewhere a full or partial altitudinal migrant, notably in KwaZulu-Natal, where non-breeding visitor (Apr–Sept) to Lebombo Range and to coastal forests SW from Richard's Bay. Most movements probably short (less than 100 km), and often involve immigration into areas with residents. Some "leap-frog" movements occur.
Status and Conservation. Not globally threatened. Restricted-range species: present in South African Forests EBA. Generally common. Abundant resident in Ngoye Forest. In Lesotho, recently found in Tšehlanyame Nature Reserve. Breeding density c. 1 pair/ha. Range has almost certainly shrunk in historical times as a result of forest exploitation.
Bibliography. Ambrose (2002), Beresford (2003), Clancey (1981, 1982a), Ferguson *et al.* (2002), Ginn *et al.* (1989), Harcus (1977b), Harrison *et al.* (1997), Keith *et al.* (1992), Kuiper & Cherry (2002), Maclean (1993), Oatley (1959, 1966, 1969, 1970a, 1970c, 1998), Sinclair (1984), Sinclair & Ryan (2003), Stattersfield *et al.* (1998), Tarboton (2001), Tarboton *et al.* (1987).

224. White-headed Robin-chat

Cossypha heinrichi

French: Cossyphe à tête blanche **German**: Weißkopfrötel **Spanish**: Cosifa Cabeciblanca
Other common names: Angola/Heinrich's/Rand's Robin-chat

Taxonomy. *Cossypha heinrichi* Rand, 1955, about 30 km north-east of Duque de Braganza, Angola. Monotypic.
Distribution. SW DRCongo and N Angola.



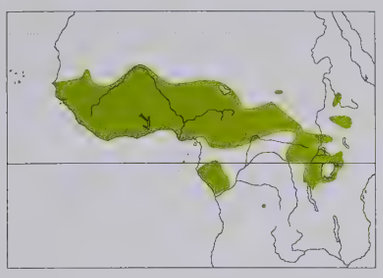
Descriptive notes. 22–23 cm; 56–69 g. Very long-tailed. Has white hood to neck, greyish olive-brown mantle to scapulars and back, orange-rufous rump to tail, latter with black central feathers, blackish wings; rich orange-rufous below; bill black, legs slate. Sexes similar, male longer-tailed than female. Juvenile has head to breast buffy with dusky scaling, belly ochre, tail as adult. Voice. Undocumented.
Habitat. Dense undergrowth of evergreen forest clumps and gallery forest in savanna, to 1250 m.
Food and Feeding. Insects, including beetles and ants. Doryline driver ants dominant in small sample to date; one stomach of young female full of driver ants, including many large-headed soldiers; myrmecophagy rare among African robins, usually done only by inexperienced young. Forages on ground and at lower levels, 3–4 m. Attends driver-ant columns, even following them from forest shade a short distance into open savanna.
Breeding. Dependent fledglings in Nov in Angola, suggesting laying in Oct, coinciding with S rainy season; dependent fledgling and post-juvenile moult in Nov and bird in breeding condition in Sept in W DRCongo, suggesting laying in Feb and Sept. No other information.
Movements. Presumably sedentary.
Status and Conservation. VULNERABLE. Estimated global population more than 10,000 mature individuals, but considered to be declining. All known sites (one in Angola, up to six in DRCongo) suffering from deforestation for charcoal production and farmland. Survey work needed to clarify true status and requirements of species, but current evidence suggests that it has a moderately narrow range within which it is patchily distributed and often rare. Known from only one protected area, Bombo-Lumene Game Reserve, near Kinshasa, in DRCongo; since 1976 this has encompassed a "fauna and forest reserve", but the site is poorly staffed and poorly equipped, and experiencing rampant deforestation. Protected areas for the species are called for in both countries where it occurs.
Bibliography. Clancey (1986), Collar & Stuart (1985), Dean (2000), Fishpool & Evans (2001), Harrison (1977), Heinrich (1958), Keith *et al.* (1992), Louette (1981b), Mayr & Peters (1999), Oatley (1998), Rand (1955), Ripley & Heinrich (1966b), Sinclair *et al.* (2004), Sinclair & Ryan (2003), Stattersfield & Capper (2000).

225. Snowy-crowned Robin-chat

Cossypha niveicapilla

French: Cossyphe à calotte neigeuse **German**: Schneescheitelrötel **Spanish**: Cosifa Coroninívea
Other common names: Snowy-headed Robin-chat

Taxonomy. *Turdus niveicapilla* Lafresnaye, 1838, Senegal.
Black-backed birds (dominant in L Victoria Basin) commonly separated as race *melanonota*, but intergradation with greyer-backed individuals so extensive as to render naming of geographical races problematic. Treated as monotypic.
Distribution. SC Mauritania, Senegal, Gambia and Sierra Leone E to Sudan and W Ethiopia, S to Cameroon and L Victoria Basin; also Gabon, S PRCongo, extreme SW DRCongo and extreme NW & NE Angola.
Descriptive notes. 20·5–22 cm; 34–45 g. Notably long-tailed. Central crown and hindcrown are white, dotted with black (variable, dependent on degree of feather wear), rest of head black; mantle



to scapulars and back olive slate-grey (darker or black in E of range), rufous rump to tail, latter with black central feathers, dark brown wings fringed blue-grey; rufous-orange below, this colour extending around neck; bill and legs black. Sexes similar, female rather smaller. Juvenile is dark brown with rufous spots above, rufous with dark brown scaling below, tail as adult. Voice. Song a fast, almost unbroken string of mimicry of other birds, with variations and powerful interspersed whistles, much more powerful, varied and rich than that of *C. albicapillus*; one individual sang continuously for 15 minutes. Also persistent soft mournful "tooo" whistle, sometimes with second note higher (but not slurred like that of *C. albicapillus*), and repeated whistled "hui-hu-hui". Calls include guttural ratchet-call, "krrr", in alarm and when roosting, and loud whistled "whiiuu whiiuu whiiuu" (or "heeee") for contact.

Habitat. Closed thickets in savanna, rank growth along streams, gallery forests and, in climatically wetter areas, coastal scrub, old plantations (e.g. coffee and banana), clearings, secondary forest and rainforest edge; sometimes enters densely vegetated gardens and mangroves. Typically in thickets around single large woodland trees, termite mounds or large boulders. Sea-level to 1400 m in most of range, but to 1600 m in Liberia, 2000 m in Cameroon and W Kenya, and 900–1400 m in Uganda and Tanzania; sometimes to 2400 m in E Africa.

Food and Feeding. Invertebrates and small fruits. Stomachs of 16 birds from DRCongo held termites, beetles, ants, caterpillars, mantises, small millipedes and small molluscs, in four cases also berry seeds. Forages mainly on ground and at low levels.

Breeding. May–Sept, chiefly Jul–Aug, in W Africa; in all months, peak Mar, in rest of range; most E African records during long rains (Mar–Jun), and suggested as breeding Feb–Nov in DRCongo. Territory 0·5–1 ha in PRCongo. Nest an open cup of twigs, leaves, grass, moss, rootlets and sometimes a little mud, lined with rootlets and tendrils, placed 1–1·6 m above ground in hole, recess or fork, on stump or in bush or vine. Eggs 2–3, olive-green, sometimes suffused with russet-brown. No other information.

Movements. Mainly sedentary, so far as known. Local seasonal displacements suspected in parts of Sudan, and a rains migrant (May–Oct) to N Nigeria.

Status and Conservation. Not globally threatened. Sparse in main Upper and Lower Guinea forest areas and in Angola, but locally fairly common in Sudan; frequent to common in W Ethiopia and SW highlands. Fairly common but local in W Kenya. Present in Manovo-Gounda-Saint Floris National Park, in Central African Republic, Murchison Falls National Park, in Uganda, Saiwa National Park, in Kenya, and Gombe Stream Game Reserve, in Tanzania.

Bibliography. Bannerman (1953), Barlow *et al.* (1997), Beresford (2003), Borrow & Demey (2001), Britton (1980), Brosset & Érard (1986), Brown & Britton (1980), Chapin (1953), Christy & Clarke (1994), Dowsett & Dowsett-Lemaire (1997), Eisentraut (1973), Elgood *et al.* (1994), Gatter (1997), Hempel (1986), Jensen & Kirkeby (1980), Keith *et al.* (1992), Kirschke (1993), Lippens & Wille (1976), Ndao (1999), Nikolaus (1987), North & McChesney (1964), Oatley (1998), Sharland & Wilkinson (1981), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002), Thiollay (1985), Traylor (1962), Wilkinson & Beecroft (1985), Zimmerman *et al.* (1996).

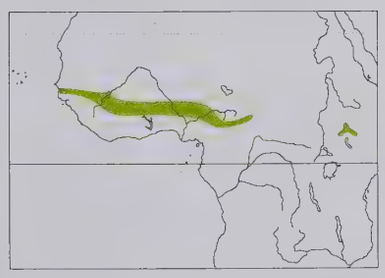
226. White-crowned Robin-chat

Cossypha albicapillus

French: Cossyphe à calotte blanche **German**: Weißscheitelrötel **Spanish**: Cosifa Coroniblanca

Taxonomy. *Turdus albicapillus* Vieillot, 1818, Senegal.
Original species name is a noun in apposition, and thus invariable. Three subspecies recognized.

Subspecies and Distribution.
C. a. albicapillus (Vieillot, 1818) – Senegal and Gambia E to NE Guinea.
C. a. giffardi Hartert, 1899 – S Mali and N Ivory Coast E to N Cameroon and S Chad.
C. a. omoensis Sharpe, 1900 – SE Sudan and SW Ethiopia.



Descriptive notes. 23–27 cm; 53–65 g. Resembles *C. niveicapilla*, but much larger and very long-tailed, lacks orange-rufous semi-collar; differs from all congeners in having red iris. Nominate race has forehead, crown and superciliary area white, scaled black; rest of head blackish, upperparts brownish, rump rufous, tail black with rufous outer feathers; chin black, rufous below; bill and legs black. Sexes similar, female rather smaller and shorter-tailed. Juvenile undescribed. Race *giffardi* is like nominate, but crown more strongly tipped black, mantle, wings and central tail black, underparts paler; *omoensis* is like previous, but darker below. Voice. Song a sustained, variable-speed, rich warbling with trills and scratchy harsh notes, not generally employing mimicry, pleasant but not particularly musical. Often a repeated piercing, upslurred "tooo-eee", or rising "tsueee" followed by faster monotone "tsu, tsu-tsu-tsu-tsu-tsu". Calls include harsh snarl or rasping rattles in alarm, and sad high thin whistled "swiiuwii" for contact and in mild alarm.

Habitat. Thickets and gallery forest, usually in dry savanna-woodland areas with 300–500 mm annual rainfall, dense riverine scrub, overgrown plantations, gardens, plots with dense shady undergrowth; sea-level to 950 m. Race *omoensis* in woodland thickets in rocky hills, at c. 1500 m.

Food and Feeding. Few data; foraging birds apparently take insects in Nigeria, and are sometimes caught in traps baited with termites and ants in Cameroon. Forages mainly on ground under thickets, tossing over leaf litter; also searches boles and logs at head height. In pairs or small parties.

Breeding. Jun, Aug–Sept and Dec in Gambia, Dec in Niger and Burkina Faso, and Jul in Nigeria. Nest a scant open cup of decaying leaves and rootlets, rimmed with tendrils, placed 1·2 m off ground in hollow atop small tree stump in thick vegetation on streambank, or in hanging flower pot, in fallen palm frond or at base of pruned palm frond. Eggs 2, greyish-green with reddish-brown spotting and clouding. No other information.

Movements. Sedentary in Sudan, and elsewhere so far as known, but possibly partial migrant in W Africa; changes in seasonal abundance noted in Mali, where commonest in N during Apr–Oct rains, and more obvious in S during Nov–Mar dry season.

Status and Conservation. Not globally threatened. Widespread and locally common in Senegal; common in Madingo Mts, in Mali; frequent in N Ivory Coast; probably not uncommon in N Ghana; frequent and widespread in C Nigeria. Present in Niokola Koba National Park, in Senegal, and W National Park, in Niger. Race *omoensis* poorly known, restricted to Boma Hills, in SE Sudan.

Bibliography. Bannerman (1953), Barlow *et al.* (1997), Borrow & Demey (2001), Crisler *et al.* (2003), Giraudoux *et al.* (1988), Gore (1990), Green (1984), Jensen & Kirkeby (1980), Keith *et al.* (1992), Koster & Grettenberger (1983), Morel & Morel (1990), Nikolaus (1987), Oatley (1998), Serle (1940), Sinclair & Ryan (2003), Thiollay (1985), Wilson (1989).

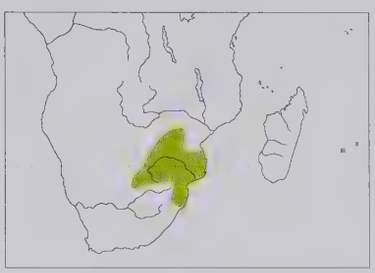
227. White-throated Robin-chat

Cossypha humeralis

French: Cossyphe à gorge blanche **German**: Weißkehlrötel **Spanish**: Cosifa Gorgiblanca
Other common names: White-shouldered Robin-chat

Taxonomy. *Dessonornis* [*sic*] *humeralis* A. Smith, 1836, banks of the Marico River, western Transvaal, South Africa.
Previously placed in genus *Bessonornis*. Proposed race *crepuscula* (from N & E of range) considered indistinguishable. Monotypic.

Distribution. Zimbabwe and SE Botswana E to S Mozambique and NE South Africa.



Descriptive notes. 17–18 cm; 19–29 g. Has white forehead and supercilium; crown and neck side to back and scapulars slate-grey, rufous-orange rump and tail, latter with black central feathers and tips; black wings with white lesser and inner secondary coverts (broad white line); black face, white chin to belly shading to orange-buff on lower flanks, buffy-orange on vent and undertail-coverts; bill and legs black. Sexes similar, female slightly duller. Juvenile is like adult, but mottled orange-buff above, buff with black flecks below. Voice. Song, by both sexes (only male Jun–Jul), usually from high songpost, but by male often quietly from low perch in heat of day, a burst of high-pitched warbling and mimicry lasting c. 10 seconds. Calls include plaintive whistled "siip-chwiiyuu" (like sound of bicycle pump) for contact, first note also in low alarm, and guttural ratchety "burg" in high alarm; also imitations of alarm calls of other species, e.g. *Turdus libonyanus*; squeaky "si-tuu" often as alarm around nest.

Habitat. Thickets in open and closed woodland, riparian and sand-forest edges, landward ecotones of coastal dune forest, dense growth on termitaria, in dry gulleys, hill thickets and open straggling vegetation, especially where thick carpet of leaf litter exists; readily enters well-sheltered gardens. Earlier reports of association with water mistaken; uses denser areas of cover such as are found near water in more open woodland (e.g. *Terminalia*), but not tied to sites with water. Occurs mainly on the plateau above 900 m in Zimbabwe, but down to sea-level in South Africa.

Food and Feeding. Invertebrates and fruit. Of twelve stomachs and 26 faecal samples, 63% held beetles, 55% ants, 42% termites, 37% caterpillars and moths, 18% spiders, 11% orthopterans, 11% bugs, 5% flies, 5% (non-spider) arachnids, 3% centipedes, and 13% fruit (including *Antidesma venosum*, *Capparis tomentosa*, *Euclea divinorum*, *E. schimperi* and *Grewia microthyrsa*). Forages mainly on ground, rummaging in leaf litter; also, frequently plucks small berries or drupes while perched or on wing, and hawks flying insects from perches in trees or shrubs.

Breeding. Sept–Dec in Zimbabwe, Dec in Botswana, and Sept–Oct in Mozambique; in South Africa, Sept–Dec in N and Sept–Nov in E; peak laying everywhere Nov–Dec. Territory guessed to be 0·5–0·75 ha in optimum habitat. Nest construction takes at least 5 days; nest an open cup of dead leaves, dried grass stems and twigs, sparsely lined with leaf skeletons, shreds of bark, fine twigs and tendrils, placed mainly (more than 90%) on ground, often at base of small tree trunk, rock, vine or plant (e.g. *Sansevieria* or aloe), and sunk so that rim flush with surface, or occasionally up to 2 m above ground in top of hollow stump or recess of bank; exposed side of nest surrounded by apron of coarse dry twigs; tins, pots and other artefacts may be used as sites near human settlements; sites sometimes reused. Eggs 3, sometimes 4 (occasional records of 2, possibly reduced by predation), white, variably speckled, spotted and clouded with buff, brown, russet, salmon and greyish-lavender; incubation period 14–15 days; nestling period 13–16 days; post-fledging dependence 4–7 weeks. Brood parasitism by Red-chested Cuckoo (*Cuculus solitarius*) at 4·94% of 81 nests. Of 26 nests in NE KwaZulu-Natal, 23% robbed of eggs, 19% robbed of chicks; 58% fledged total of 37 young.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Common. Has extended its range N in Zimbabwe, perhaps assisted by spread of alien *Lantana* thicket.

Bibliography. Beasley (1988, 1994), Day (1987), Ferguson *et al.* (2002), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Kuiper & Cherry (2002), Oatley (1998), Payne & Payne (1967), Penry (1994), Rowan (1983), Sinclair (1984), Sinclair & Ryan (2003), Swynnerton (1908), Tarboton (2001), Tarboton *et al.* (1987), Vande weghe (1988).

Genus *XENOCOPSYCHUS* Hartert, 1907

228. Angola Cave-chat

Xenocopsychus ansorgei

French: Cossyphe des grottes **German**: Höhlenrötel **Spanish**: Cosifa Angoleña
Other common names: Angolan Cave Robin, Ansorge's Cave-chat

Taxonomy. *Xenocopsychus ansorgei* Hartert, 1907, Lobango, Mossamedes, Angola.
Presumed closest to *Cossypha humeralis*. Monotypic.

Distribution. W Angola.

Descriptive notes. 18–19 cm; 30–39 g. Distinctive pied robin-chat, recalling *Copsychus saularis*. Plumage is black above, white below, but with long white supercilium, bold white shoulder patch, greyish-white rump, white uppertail-coverts, white outer tail, black face and chin; black bill and legs. Sexes similar, female somewhat smaller. Juvenile is like adult, but with yellowish tinge on breast and flanks, very fine black streaking on breast. Voice. Song musical, "dülülü dülü dülülü", has been likened to that of Woodlark (*Lullula arborea*) but also with *Cossypha* affinities, with harsher "chip" notes, and more deliberate than that of *Cossypha humeralis*. Calls include quiet "ui



ti ti, ui ti ti", possibly for contact, and harsh ringing repeated "birr-djerr" in alarm; ethereal, echoing call lasting 2 seconds, increasing in strength and then fading, was given by one of a pair in c. 5-minute bouts from exposed boulder, and repeated at intervals of c. 30 minutes. **Habitat**. Rocky hills of jointed sandstone or outcropping high cliffs, fringed or interspersed with trees and thickets and with adjacent forest patches, rocky outcrops with bushes or some *Brachystegia*, boulder-strewn gorges with thick thornbush. Recorded at 690–2200 m. Reportedly occupies riverine forest or thick undergrowth of forested slopes, well away from usual gulleys and caves, from early to middle morning; also seen on exposed slopes at this time.

Food and Feeding. Insects, including beetles (Tenebrionidae, Staphylinidae), larvae, weevils (*Blosyrus*), ants. Secretive, crepuscular. Forages on or near ground under dense undergrowth; also perches on rocks and bushes, and regularly forages on exposed outcrops, probing lichen patches. **Breeding**. Sept–Nov; two broods, in rapid succession. Territory often rather linear, along cliff top or scarp, usually c. 200 m. Nest an open cup of twigs, grasses and dead leaves, lined with thin plant material, placed on rock ledge under overhang. Eggs 2–3, white, speckled brown and reddish. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Western Angola EBA. Extremely localized distribution, confined to four areas: E Namibe and Huila, N'dalantando (in Cuanza Norte), Mt Soque (in Huambo), and Gabela area of Cuanza Sul. Locally common.
Bibliography. Braun (1956), Chapin (1948), Dean (2000), Hall (1960a), Keith *et al.* (1992), Oatley (1998), Pinto (1962), Ryan *et al.* (2004), Sinclair *et al.* (2004), Sinclair & Ryan (2003), Stattersfield & Capper (2000), Stattersfield *et al.* (1998), Stresemann (1947), Traylor (1962).

PLATE 71 ➤


creamy-ochre below
229
230
231
ssp megarhynchos
ssp hafizi
232
233
234
ssp brunnea
235
ssp wickhami
PLATE 71
inches 4
cm 10
ssp cyanecula
236
ssp magna
ssp svecica
237
ssp kobdensis
239
240
ssp tschebaiewi
238
ssp pectoralis

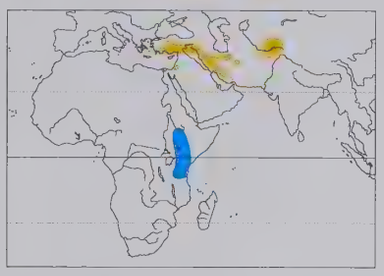
Genus *IRANIA* de Filippi, 1863

229. **White-throated Robin**

Irania gutturalis

French: Iranie à gorge blanche **German**: Weißkehlsänger **Spanish**: Petirrojo de Irán
Other common names: Irania, White-throated Irania, Persian Robin, White-necked Nightingale

Taxonomy. *Cossypha gutturalis* Guérin-Méneville, 1843, Ethiopia.
Monotypic.
Distribution. Asia Minor and Levant E to Iran, and S Kazakhstan, Tadjikistan and Afghanistan; non-breeding NE & E Africa.



Descriptive notes. 15–17 cm; 18–30 g. Male is slaty blue-grey from crown to rump and wings, with black tail; black face to malar region and neck side set between narrow white supercilium and narrow white chin and throat; buffish-orange breast, belly and flanks shading to whitish on vent, also buffish-orange underwing; some (possibly immature) have creamy-ochre breast and flanks; bill and legs black. Female is brownish-grey on face, with poorly defined pale supercilium, submoustachial and chin to throat, rustier ear-coverts, greyish-rufous breast, orange-buff flanks and underwing, black tail. Juvenile is like female, but wing feathers edged paler. Voice. Song, sometimes in flight, a loud melodious vigorous warbling, sustained for c. 10 seconds with short pauses, phrases mixing fluty whistling and throaty grating, scratchy and chattering notes, reminiscent of song of a *Sylvia* warbler, "skwee-churrileecheek-cheek-cheek-chur-skweeilew-chur-chur-chur, skwer skweeereri-tsik-tsik tsi-tsi-tsi"; some males expertly mimic other birds. Full song in winter quarters from Jan, but also quiet warbling subsong in winter and on passage. Calls include hard "tec", dry grating "turrr" or "iit-trr" or "krrrk", both *Luscinia*-like; and noisy "tzi-lit", like call of White Wagtail (*Motacilla alba*).
Habitat. Breeds in semi-desert, mountain steppe, stony arid hillsides with scrub patches, scrubby valleys, ravines with mountain streams, narrow stony gulleys, subalpine vegetation including juniper (*Juniperus*), *Zygophyllum*, bushes and tall weeds; generally at 1000–2200 m. In extreme N Israel nests in rocky terrain with scattered birch and crab apple; in Armenia semi-arid mountain scrubland dominated by wild almond (*Prunus dulcis*), alder buckthorn (*Frangula alnus*), hawthorn (*Crataegus*), dog rose (*Rosa canina*) and barberry (*Berberis*), often on S/SW-facing slopes in relatively humid ravines and abandoned orchards, perhaps favouring sites with fresh water; in Iran in open oak (*Quercus*) steppe and in woodland with well-developed bush layer. On passage in Iraq and Arabian Peninsula in palm groves, small gardens, stony areas with low cover, willows (*Salix*) and scrub. In winter quarters, scrub and thickets in semi-arid areas, notably dry acacia and *Commiphora* woodland, field edges, gulleys, sometimes gardens, in drier places than *Luscinia* species; mainly 300–1500 m.
Food and Feeding. Invertebrates and fruit. Of 58 invertebrates from stomachs of breeding birds, in Armenia, 56% were beetles (Dermestidae, Carabidae, Scarabaeidae, Tenebrionidae, *Chrysomela sahlbergi*), 21% ants, 5% grasshoppers, 3% moth caterpillars, 3% wasps and 3% spiders, 9% others. Of 49 items fed to nestlings, 43 (88%) were noctuid moth caterpillars (15 *Acronicta* species), four grasshoppers and two spiders; in another study, young again fed largely with small caterpillars. In winter mainly insects, including adult and larval beetles, ants, small grasshoppers, also centipedes and spiders, occasionally berries. Forages among low twigs and on ground, also in trees and bushes. Skulking; spends much time low in dense bushes and small trees, diving into thicket when disturbed or flying considerable distance. Sometimes highly site-faithful, perhaps territorial, in winter.
Breeding. May–Jun in Caucasus and C Asia; apparently single-brooded. Local densities can be high: eleven nests in gorge were 80–200 m apart. Nest a flat cup of twigs and cereal stalks, lined with feathers and/or hair, low down (average 0·5 m up) in tree cavity, bush or on stump or log; nests on or very close to ground contain more feathers and wool than do those higher in trees; strong site-fidelity, nests built near previous year's site. Eggs 4–6, pale greenish-blue with yellowish or rusty-brown spotting; incubation period 13 days; young leave nest at 9–10 days, climb in shrub thickets, capable of fluttering at 13–15 days, full flight at 16–18 days; post-fledging dependence 9–12 days. Nest predators are lizards, snakes and Common Magpie (*Pica pica*).
Movements. Migratory; winters in Africa from Eritrea S to Tanzania. Leaves breeding grounds in far E of range by end Aug, possibly moving directly across Middle East and Arabia. Majority appear to enter Africa by crossing from S Arabian Peninsula on narrow front (rare passage migrant Israel, mainly Aug; very rare Bahrain) through Eritrea and Somalia in late Aug to mid-Oct, delaying onward movement until Nov to early Jan, when pass into E & SE Kenya; most enter Tanzania E of Mt Kilimanjaro, but good numbers winter around L Manyara. Departure from winter quarters end Mar or start Apr, passage through Kenya and Ethiopia mid-Mar to mid-Apr; scarce to rare in Israel, mainly second half May, whereas in Bahrain main passage second half Apr. Males arrive on breeding grounds in Armenia mid-Apr. A few recents records from Greece, notably from mid-1990s on Lesbos, where breeding may occur.
Status and Conservation. Not globally threatened. In 2000 Turkish population judged to be 410,000–920,000 pairs, and considered generally stable. Generally common in Caucasus and C Asia. Uncommon breeder in Armenia, where density in one area before development was 1 bird/ha. Rare in Israel. Has bred Syria and Lebanon. In non-breeding season rather scarce and local in E Africa; recorded in Tsavo East and Tsavo West National Parks, in Kenya.
Bibliography. Anon. (2004e), Adamian (1963), Adamian & Klem (1997, 1999), Andrews (1995), Ash (1980), Baumgart *et al.* (1995), Beaman & Madge (1998), Britton (1980), Cornwallis & Porter (1982), Cramp (1988), Dementiev *et al.* (1968), Flint *et al.* (1984), Gallagher & Woodcock (1980), Glutz von Blotzheim & Bauer (1988), Goodman *et al.* (1989), Handrinos & Akriotis (1997), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Etchécopar (1970), Kasparek (1992), Keith *et al.* (1992), Lewis & Pomeroy (1989), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Paz (1987), Pearson (1984), Porter *et al.* (1996), Roselaar (1995), Shirihai (1996), Silsby (1980), Sinclair & Ryan (2003), Smith (1960), Welch & Welch (1984).

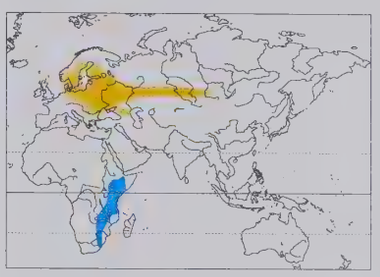
Genus *LUSCINIA* T. Forster, 1817

230. **Thrush Nightingale**

Luscinia luscinia

French: Rossignol progné **German**: Sprosser **Spanish**: Ruiseñor Ruso
Other common names: Eastern Nightingale, Sprosser

Taxonomy. *Motacilla Luscinia* Linnaeus, 1758, Sweden.
Genus has occasionally been merged into *Erithacus*. Hybridization with *L. megarhynchos* rare. Monotypic.
Distribution. N, C & E Europe E in narrow band to N Kazakhstan and upper R Yenisey, also Caucasus; non-breeding E & SE Africa.



Descriptive notes. 16–17 cm; 14–37 g. Very like *L. megarhynchos*, but less bright or less contrastingly reddish on tail and rump, greyer on back, and generally has breast diffusely mottled grey-brown; often more strongly developed malar stripe; outer primary greatly reduced in length (sometimes visible in field). Sexes similar. Juvenile as juvenile *L. megarhynchos*. Voice. Song, regularly at night but also by day, very similar to that of *L. megarhynchos* but delivery slower, phrases longer (c. 5 seconds) and separated by longer pauses (3–5 seconds), commonly lacking protracted crescendo whistle phrase; phrases typically in three sections, starting with whistling "wiiit-wiiit-wiiit..." followed by deep fluty "chuuk-u-chuuk-u..." or "chiddy-ock-chiddy-ock-chiddy-ock" and ending with deep rattle; rarely gives (perhaps only as mimicry) slow crescendoing and accelerating one-pitch whistling phrase ("wuuuuuu-") common in *L. megarhynchos*; reportedly uses mimicry, at least locally (e.g. Armenia); in confrontations song assumes strangled quality, and in courtship (also towards incubating mate, which may then sing back) becomes softer with more high-pitched units. In non-breeding quarters sings throughout period present, but on S passage song more guttural and disorganized than in spring; full song often heard Feb–Mar. Calls include guttural "tuc" or "tuc-tuc" in territorial alarm, low croaking "krrrk" in mild agitation, and whistled "wiiit", sharper and higher than that of *L. megarhynchos*; first two calls sometimes combined as "tuk tuk tuk krrrrrr" in greater alarm.
Habitat. Lowland river valleys with deciduous and mixed woodland bordering waterbodies, beech (*Fagus*) and hornbeam (*Carpinus*) forest, small woodlots (less than 1 ha) of young deciduous trees, dense thickets in forest edges (notably along roads and railways), regenerating forest on clear-cut land, wet willow (*Salix*) thickets, alder (*Alnus*) carrs, lowland orchards, river gorges, urban scrub, parks, cemeteries; key requirements are for deep soft humus with some leaf litter, tall, dense, patchy herbage (including rank patches of nettles), and thickets of brambles, bushes, shrubs and low trees typically along riverbanks, near standing water or in damp depressions. In African winter quarters found in damp rank vegetation, overgrown streamsides, thick hedges of *Euphorbia* and *Lantana*, woodland undergrowth and thickets, at 500–1500 m; on passage drier and more varied habitats, such as scrub, bushland thickets, hedges and mangroves (Sudan coast), ranging to 2200 m in E Africa.
Food and Feeding. Invertebrates, some fruit. Summer diet includes adult and larval beetles of many families, adult and larval moths, ants, sawflies, flies, bugs, caddis flies, grasshoppers, damselflies, spiders, woodlice, millipedes and snails, with fruits of elder (*Sambucus*), currants (*Ribes*), bramble (*Rubus*), mulberry (*Morus*), vine (*Vitis*) and service (*Amelanchier*). In Armenia mainly leaf-litter insects, with small amounts of plant matter; seen to feed on mulberries in Jul. In E Germany, invertebrate content of stomachs was 53% hymenopterans (largely ants), 24% beetles (largely adults), 9% bugs, 4% earwigs and 10% others; 53% involved terrestrial species, 34% leaf-dwellers and 13% undetermined. Diet of young at same site consisted of 38% beetles (mostly larvae), 20% lepidopterans (mostly larvae), 13% flies (mostly adults), 11% woodlice, 9% spiders, 3% hymenopterans, 3% bugs and 3% others; 54% involved subsoil species, 43% were herb-layer or shrub-layer species, rest undetermined; items smaller than those taken by adults. Young in Russia fed with 29% lepidopterans (mostly larvae), 20% larval snake-flies (Rhaphidiidae), 18% spiders, 16% beetles (mostly adults), 8% bugs, 4% snails, 3% adult flies and 2% grasshoppers. In Africa mainly invertebrates, especially insects such as ants, beetles, small grasshoppers, and flies and lepidopterans at all stages, also millipedes and small molluscs; sometimes fruit and seeds. Forages mainly on ground, hopping about in leaf litter; also gleans insects from herb and shrub layers, and occasionally sallies after flying insects. Territorial in winter quarters, spacing out at c. 100-m intervals.
Breeding. Mid-May to early Jul, perhaps somewhat later in E; single-brooded. Nest a loose bulky cup of leaves and grass, lined with fine stems and hair, placed on ground in sheltered position among dead branches, roots or thick leaf litter. Eggs 4–5, olive-green with reddish freckling; incubation period 13 days; nestling period 10 days; post-fledging dependence 2–3 weeks. Of 216 eggs in 45 nests in Finland, 86% hatched, and 89% of hatchlings fledged, giving overall breeding success of 77%. Age of first breeding normally 2 years, but some males breed as yearlings. Oldest recorded individual 8 years 11 months.
Movements. Migratory; winters in Africa, mainly S Tanzania S to E South Africa. Very common along Red Sea coast of Sudan in autumn, but very rare in spring; common to abundant E of Rift Valley on S migration, when more than 31,000 ringed Nov–Dec in Tsavo West National Park (Kenya) 1969–1995, but less numerous from late Mar to mid-Apr. Populations from Baltic and C Europe move SE from early Aug, peak passage in Hungary mid-Aug, in Slovenia second half Aug or early Sept, skirting W shore of Black Sea and crossing E Mediterranean, passing through Israel mainly Sept, and into Egypt, rapidly through NE Sudan (where second most abundant migrant on coast

On following pages: 231. Common Nightingale (*Luscinia megarhynchos*); 232. Rufous-tailed Robin (*Luscinia sibilans*); 233. Siberian Blue Robin (*Luscinia cyane*); 234. Firethroat (*Luscinia pectardens*); 235. Indian Blue Robin (*Luscinia brunnea*); 236. Bluethroat (*Luscinia svecica*); 237. Black-throated Blue Robin (*Luscinia obscura*); 238. Rufous-headed Robin (*Luscinia ruficeps*); 239. Siberian Rubythroat (*Luscinia calliope*); 240. White-tailed Rubythroat (*Luscinia pectoralis*).

Aug–Sept) to reach W & C Ethiopia, where apparently stop over for several weeks, as onward S movement through C & SE Kenya and NE & C Tanzania occurs early Nov to mid-Dec. C breeding populations presumably move S between Black and Caspian Seas (first passage in Crimea late Jul) and merge with W breeders in E Mediterranean, while at least some E breeders move down E and then S sides of Caspian from end Aug to mid-Sept, passing through Middle East and Gulf (Bahrain Sept–Oct), but main flyway into Africa unclear, perhaps involving W movement to N Red Sea area or broad-front crossing of Arabian Peninsula; considerable numbers pass along Turkish Black Sea coast mid-Aug to late Sept. Majority of autumn population assembled in Kenya moves E of Mt Kilimanjaro on a front c. 250 km wide and shifting direction from S to SSW, wintering in area from SW Tanzania S to N Botswana and N South Africa during late Nov to late Mar. Spring passage in Kenya from late Mar to mid-Apr, in Ethiopia early Apr to mid-Apr, last birds in Egypt in early May; main passage Israel mid-Apr to end May, Bahrain Apr to early May, later birds in Middle East presumed en route to E parts of breeding range (first arrivals in SC Siberia not until second half May), whereas earlier migrants probably move to W parts of breeding range, where arrival typically in first 10 days May. Vagrants regularly recorded in W Europe.

Status and Conservation. Not globally threatened. Total European population in mid-1990s estimated at 832,226–1,041,309 pairs, with additional 100,000–1,000,000 pairs in Russia W of Urals. By 2000 European population (including European Russia) revised to 3,700,000–6,900,000 pairs, and considered generally stable. Marked increase in numbers in N & W of European range in 1960s and 1980s, e.g. population in Finland rose from 200 pairs in 1950s to 20,000–50,000 pairs in 1990s; reasons presumed to include cessation of grazing and lowering of lake levels, both allowing succession involving young deciduous woodland. Uncommon in Armenia. In winter quarters locally common to abundant; uncommon to abundant on passage through E half of Africa, depending on area.

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231. Common Nightingale

Luscinia megarhynchos

French: Rossignol philomèle **German**: Nachtigall **Spanish**: Ruiseñor Común
Other common names: (Rufous/Western) Nightingale

Taxonomy. *Luscinia megarhynchos* C. L. Brehm, 1831, Germany.

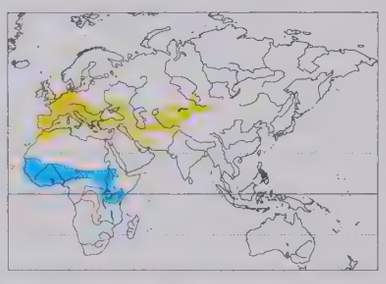
Genus has occasionally been merged into *Erithacus*. Hybridization with *L. luscinia* rare. Geographical variation partially clinal, from darker, shorter-winged and shorter-tailed in W to paler, longer-winged and longer-tailed in E. Additional races have been suggested, but generally considered untenable; *corsa*, *luscinioides*, *caligiformes*, *tauridae* and *baehrmanni* all synonymized with nominate. Three subspecies recognized.

Subspecies and Distribution.

L. m. megarhynchos C. L. Brehm, 1831 – NW Africa, W & C Europe E to C Turkey and Levant; non-breeding Africa.

L. m. africana (G. A. Fischer & Reichenow, 1884) – Caucasus area and E Turkey E to N & SW Iran; non-breeding NE & E Africa.

L. m. hafizi Severtsov, 1873 – E Iran E to Kazakhstan, SW Mongolia, NW China (W Xinjiang) and Afghanistan; non-breeding E Africa.



Descriptive notes. 16–17 cm; 16–39 g. Nominate race is plain warm brown above, shading to rusty-brown tail and rump, whitish below, with slightly sandy-buff breast and flanks; large black eye set in narrow pale eyering, with poorly defined greyish supercilium; bill dark, pale flesh base; legs flesh-brown. Sexes similar. Juvenile is brown with buff spotting above, rump and tail rusty-brown, buff with relatively weak dark scaling below. Race *africana* is duller and less rufous above, paler below, with grey-brown breast; *hafizi* is greyer above, with whitish lores and vague supercilium, whiter below, sandy breast. Voice. Sings extensively at night (to attract mate, ceasing once pair established, except in egg-laying phase), also by day (song usually rather less varied), also in winter quarters Dec–Mar (again, weaker and less varied). Song powerful, rich and varied, considered by many to be the finest produced by any bird species; consists of succession of full mellow phrases, each 2–4 seconds long with similar-length pauses, each phrase a repeated note or combination of notes, some phrases clear and fluty, others bubbling, churring, rattling or chattering, one a low, long-drawn, repeated whistle ("wuuu") that increases rapidly in volume and speed of delivery and ends with flourish (many phrases end with whipcrack note); typical series of phrases would be "pichu-pichu-pichu-pichurrrrrrr-chí!, wiiit-chuk-chuk-chuk-chuk-chuk-chuk-chí!, wuuuuuuuuu-wuuuuu-wuu-wuwu-twík!, chatatatatatatatatatatatatatat, chiiyo-chiiyo-chiiyo-chiiyo-chí!". Courtship song, by male, quieter than territorial song, given near nest; contact song, by both sexes, short and fragmentary, used only on breeding territory. Calls include grating "krrr", hard "tec-tec", whistled "wiiit" or "wiiit-krrr", and harsh "kaarr"; in courtship a bleating "hä-hä-hä-hä".

Habitat. In Europe in two main habitat types: lowland open woodland with thickets and dense patches of vegetation of coppice stands, nettles and brambles, bordering waterbodies (this most closely matches that of *L. luscinia*); and edges and glades of broadleaf woodland, undergrowth-rich pinewoods and dry maquis, garrigue and shrubbery on sand and chalk (i.e. with no surface water). Also in various intergradations of the two, such as cultivated land with mature hedgerows and untended bush-rich suburban gardens and parks with leaf litter. Generally below 500 m in N & W, to 1400 m in S Europe. In Russia breeds in dense riverbank cover, in open hornbeam (*Carpinus*) woodland, in oak (*Quercus*) and beech (*Fagus*) forest, alder (*Alnus*), sea buckthorn (*Hippophae*) and hawthorn (*Crataegus*) thickets, and orchards. Farther S occupies scrubby woodland, undergrowth-free orchards, edges of wadis, thickets, bramble and nettles. In Morocco breeds mainly along streams in woodland, in low thickets (especially bramble) along rivers, coastal maquis, undergrowth of cork oak forest, holm oak coppice, brushwoods (*Tetraclinis*, *Olea*, *Pistacia*) and orchards, in plains and on lower slopes up to 1300 m, occasionally in cultivated valleys to 1850 m. In Afghanistan up to 2300 m in shady tangles, thickets and scrub, usually near water; also orchards and gardens. In African winter quarters, occurs in dense forest edge and secondary growth, riverine and woodland thickets, savanna scrub, farmbush, thorny scrub, rank herbage along watercourses, overgrown clearings, tall grass patches, field margins and garden hedges, from sea-level to 1600 m. Where sympatric in winter with *L. luscinia* in E Africa, occupies drier scrub and woodland undergrowth, less confined to valleys and small watercourses. Territorial in winter quarters, often singing from cover (usually in morning), Nov–Mar; record of 3–4 singing 10 m apart in same thicket in Togo suggests very small defended areas, but each may have been countersinging at corner of territory.

Food and Feeding. Mainly invertebrates (especially beetles and ants) all year; also berries and seeds in late summer and autumn. Stomachs of eleven breeding birds from Crimea held 89% ants and 9% beetles, and a mollusc, a millipede and a woodlouse. Also takes caterpillars, flies, spiders and earthworms. Food brought to nestlings in E Germany comprised 25% adult and larval beetles, 24% adult and larval flies, 12% adult and larval hymenopterans, 11% adult and larval lepidopterans, 8% bugs, 8% spiders and 12% springtails, stoneflies, grasshoppers, lacewings, caddis flies, isopods, millipedes and crustaceans; in Turkmenistan 61% insects, 17% woodlice, 15% berries and 7% spiders, with further sample there yielding 32% insect larvae, 30% ants, 15% spiders, 13% grasshoppers, 8% berries and an earthworm. In late summer, fruits taken include strawberry (*Fragaria*), bird cherry (*Prunus padus*), currant (*Ribes*), alder buckthorn (*Rhamnus*), elder (*Sambucus*), service (*Amelanchier*) and dogwood (*Cornus*). In African non-breeding quarters, food mainly insects, such as ants and their pupae, adult and larval beetles, small moths, caterpillars, flies, small orthopterans, and termites; also spiders, earthworms and occasionally berries. Forages within dense cover, mainly on ground in leaf litter, but also gleaning on low branches and leaves; occasionally drops from perch onto prey, or pursues it in aerial sally.

Breeding. Late Apr to mid-Jul throughout Europe; May–Jul in Afghanistan; mid-Apr to Jun in Morocco and May in Algeria; single-brooded in Britain, but often double-brooded. Territory 0·13–1·9 ha. Strong breeding site-fidelity, but often twice as many males as females returning to same territory in following year. Nest (occasionally domed) a bulky cup of dead leaves and grass, lined with fine grasses, feathers and hair, on or very close to ground (great majority below 0·5 m) in base of thicket or low herbage. Eggs 4–5, pale bluish with pale reddish-brown freckling; incubation period 13–14 days; young leave nest at 10–12 days, disperse into surrounding cover and become capable of flight 3–5 days later; post-fledging dependence 15–30 days, sometimes with brood division and groups moving beyond the territory; female may begin incubating second clutch while male continues to care for first brood. In studies in England, 69% of nests produce at least one fledged young, 23% fail during incubation, 10% during nestling period; in Germany, 15% of broods lost; in four-year study in Italy, hatching success 79%, fledging success 85%, overall breeding success 67%. Causes of mortality of ringed birds in NW Europe are domestic predator 39%, human-related (accidental) 35%, human-related (deliberate) 17%, other 9%. Oldest recorded individual 7 years 11 months.

Movements. Migratory, using two main pathways. Nominate race migrates over broad front across N Africa, wintering from Senegal E to W Ethiopia and Uganda. Departs Europe late Jul to early Sept, peak passage in S England late Aug, moving in broad SW direction, with majority in W Mediterranean, but passage in (mainly W) Spain lasts Aug–Oct, with juveniles earlier than adults; peak passage at Bosporus, presumably involving Ukrainean and E European populations, late Jul to early Aug; sparse records in N Africa suggest that Mediterranean Sea and Sahara may often be crossed in single long-distance flight. Passage in Senegal mainly Oct–Nov, N Nigeria Sept to early Nov (peak late Oct), Chad mainly Oct, Sudan Sept–Oct; arrives in winter quarters late Oct to early Dec, remaining until mid-Mar and early Apr, which is time of main N return passage N Nigeria, while in N Africa broad-front passage occurs late Mar to mid-May, peak mid-Apr. E races *africana* and *hafizi* cross Arabia to winter in C Ethiopia and E Africa. Autumn passage in Bahrain Sept–Oct, UAE late Aug to early Oct, Oman Sept to early Oct, Israel mainly Sept, arrival in Ethiopia from late Sept to early Nov, S Somalia and Kenya Nov to early Dec; remain in winter quarters to late Mar and early Apr, *africana* mainly inland, *hafizi* mainly at coast; spring passage in Israel mainly mid-Mar to early May, UAE late Mar to May, Bahrain late Mar to mid-May. Very fat migrants in Ethiopia in Apr suggest single long-distance N migration, at least by some individuals, and explain relative scarcity of spring birds in Arabia.

Status and Conservation. Not globally threatened. European population in mid-1990s esitmated at 3,184,886–4,617,751 pairs, with additional 50,000–500,000 pairs in Turkey but only 10–100 in Russia; in Iberia at that time some 450,000–1,700,000 pairs estimated, although more recently Spain judged to hold minimum 229,019 pairs. By 2000 total European population (including European Russia and Turkey) revised to 4,200,000–12,000,000 pairs, and considered generally stable. Censuses of singing males in Switzerland (Rhine Valley) suggested high proportion of unpaired birds, so counts of songsters may inflate breeding estimates. Density of 0·5 pairs/ha in E France (Alsace), in probably optimal habitat (small woods, forest edge, isolated rows of trees, commonly near water); but 0·71 pairs/ha found in scrubby marshland in Switzerland. In NE of European range, numbers increased and range expanded from c. 1930 (presumably with increase in young deciduous woodland following cessation of grazing and lowering of lake levels, perhaps also as a result of climate change), returning to levels that existed c. 1900. Modern agricultural development and increasing tendency for "tidying" of gardens and woodland have contributed to a decline since 1950s in W of range; English population has been declining and contracting since at least 1910, and only 6,700 singing males estimated in 1999 (increases in deer populations may be responsible for local decreases). In Spain, there is concern over steady loss of nesting habitat along streams and rivers. Elsewhere, common breeder in Morocco but scarce in Tunisia. Locally common in Afghanistan and common or locally numerous in most of Asian range, but rare at E extreme (W China).

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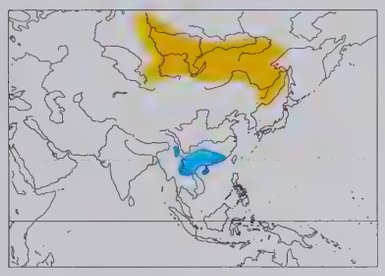
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232. Rufous-tailed Robin

Luscinia sibilans

French: Rossignol siffleur **German**: Schwirrnachtigall **Spanish**: Ruiseñor Silbador
Other common names: Swinhoe's/Red-tailed Robin, Whistling Nightingale

Taxonomy. *Larvivora sibilans* Swinhoe, 1863, Macao, south-eastern China.
Sometimes placed in genus *Erithacus*. Monotypic.
Distribution. C & E Siberia and NE China; non-breeding S & SE China and SE Asia.



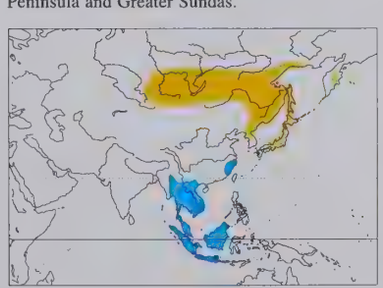
Descriptive notes. 13–14 cm. Plumage is warm mid-brown above, with rufous lower rump and tail, whitish below, with delicate grey-tinged mid-brown scaling on throat or throat side and across mid-breast, buffy flanks; buffy-white eyering and preocular supercilium; bill blackish to brown, legs pinkish-brown. Sexes similar, female marginally paler. Juvenile is like adult, but with ochre subterminal spots and dark edgings of feathers above, ochre-tinged underparts. VOICE. Song, at height of breeding season given also at night, a series of identical phrases consisting of a very loud, accelerating, slightly downslurring silvery trill, "tiuuuuuuuuuuuuuuuuwwwww", resembling neigh of distant colt. Calls include single whistle in alarm, and clinking "chok-chok" by parents with brood.
Habitat. Damp broadleaf evergreen and semi-evergreen bottomland forest with dense undergrowth, fallen trees and thickets, also low-lying conifer (mainly spruce–fir) forest with similar understorey structure (e.g. with birch, willow, alder, poplar and bird cherry), moist shady second growth, preferring broken, uneven canopy structure; mainly plains and lowlands, to 1200 m. In winter in Hong Kong, found in forest, *fung shui* woodland, lightly wooded areas and adjacent scrub, urban parks and gardens.
Food and Feeding. Beetles, ants, spiders, etc. Forages mainly on ground.
Breeding. Jun–Jul in Russia. Nest a cup of old leaves, moss, grass stems and pine needles, lined with fine stems and rootlets, placed generally low down (once 15 m up) in tree hole, or on stump. Eggs 5–6, plain pale blue or bluish-grey with brown spots. No other information.
Movements. Migrant. Autumn passage in Russia begins late Aug, but in Korean Peninsula and at Beidaihe (NE China) occurs late Sept to mid-Oct, with return in May (Korea). Main influx into Hong Kong mid-Nov, smaller numbers remaining over winter, and spring peak in early Apr. Spring return in Russia mid-May into early Jun. Rare or irregular on passage in Japan. Scarce to fairly common winter visitor, but never in large numbers, in N Thailand, Laos and N & C Vietnam. Vagrant recorded in 2004 in Britain (Fair Isle, in Shetland Is).
Status and Conservation. Not globally threatened. Generally fairly common over extensive range in Russia (Siberia to Far East), but somewhat patchy owing to habitat requirements. Not proven to breed in N Korea and, if confirmed, unlikely to be numerous there, but common in adjacent parts of SE Russia. Uncommon in China.
Bibliography. Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Brazil (1991), Carey *et al.* (2001), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Gore & Won Pyongoh (1971), Herklots (1967), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Robson (2000), Tomek (2002), Vaurie (1955c), Wildash (1968), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

233. Siberian Blue Robin

Luscinia cyane

French: Rossignol bleu **German**: Blaunachtigall **Spanish**: Ruiseñor Azul
Other common names: Siberian Bluechat, Blue Groundchat

Taxonomy. *Motacilla Cyane* Pallas, 1776, Dauria, between the Onon and Argu Rivers, south-east Transbaikalia, Russia.
Sometimes placed in genus *Erithacus*. Two subspecies recognized.
Subspecies and Distribution.
L. c. cyane (Pallas, 1776) – SC Siberia and N Mongolia; non-breeding SE Asia.
L. c. bochaiensis (Shulpin, 1928) – E Siberia, NE China, N Korea and Japan; non-breeding Malay Peninsula and Greater Sundas.



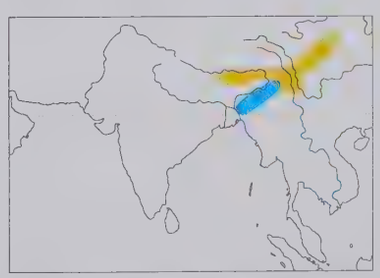
Descriptive notes. 13–14 cm; 11–18 g. Male nominate race is slaty-blue from crown to tail, black on face extending across neck side to flanks; white chin to vent and undertail-coverts, blue-grey lower flanks and thighs; bill black, pinkish lower mandible in winter; legs pinkish. Female is like *L. sibilans*, but slightly greyer above, with bluish-tinged brown wings, rump and tail, weaker and buffier scaling below, paler brown flanks. Juvenile is blackish-brown with ochre-rufous drop-like streaks above, uppertail bluish (male) or brownish (female), throat, breast and flanks brownish-ochre with indistinct scaly pattern, belly whitish. Race *bochaiensis* is darker above than nominate. VOICE. Song, by male throughout breeding period, a loud, rapid, explosive trilling "tri-tri-tri-tri, tjuree-tiu-tiu-tiu", usually prefaced by some thin, regularly spaced "tsit" notes; resembles that of *L. akahige*, but more varied; female sings occasionally at nest or with fledglings, once in response to human approach. Call a single "tak" or rapid low "tek-tek-tek" or "chuck-chuck-chuck", and louder "se-ic".
Habitat. Breeds in deep taiga consisting mainly of spruce (*Picea*), fir (*Abies*), birch (*Betula*), pine (*Pinus*) and aspen (*Populus*), in dense scrub patches formed by fallen trees and branches, in gallery forest of spruce and fir bordering tall-herbaged taiga meadows, riverside coppices, aspen–fir tracts in mountains, rarely also open oak woods; in Japan in deciduous, mixed and coniferous forests with dense undergrowth, particularly near streams and in sheltered valleys. Lowlands in N Japan (Hokkaido), but in montane forest mainly at 1000–1600 m in Honshu (generally lower than *L. akahige*). Winters in ground storey of damp primary and secondary broadleaf evergreen and mixed deciduous forests, logged forest, thickets, bamboo brakes (commonly), moist shady second growth, overgrown rubber plantations, coastal vegetation; especially along streams and foothill brooks. On migration, found also in mangroves, reedbeds, parks and gardens. In non-breeding season generally below 500 m, but recorded to 1680 m while migrating in Borneo. Occupies less dense undergrowth, and perches more often, than do most congeners.
Food and Feeding. Insects (including bugs, beetles and ants), berries and grass seeds reported in China, summer; also "small clams". Food brought to nestlings in Japan was 36% adult insects, 28% insect larvae, 18% spiders and 18% unidentified (total food weight per visit 56–608 mg). In winter, recorded as eating small black insects, many taken in leaf litter; also fruit, sometimes hovering to pluck berries. Forages on ground and in low undergrowth, both running and hopping around like a small crake (*Porzana*).
Breeding. Jun–Jul in Russia, and May–Jul in China and Japan. Territory in Japan averages 1 ha in deciduous forest, 0·5 ha in coniferous forest. Nest a crude cup of moss and leaves, lined with animal hair, placed on steep-sided ground or bank amid tree roots, fallen branches, under ferns, amid leaf tangles, etc., usually in cover of scrub in thick forest. Eggs 4–6, sky-blue to bright blue or greenish-blue. No information available on incubation and nestlings periods. Brood parasitism by Hodgson's Hawk-cuckoo (*Cuculus fugax*) occurs. Predation of nests placed close to paths has been noted.
Movements. Migrant. Autumn departure Japan late Aug to early Oct; few records from Ryukyu Is, suggesting migration path more strongly W. In Russia and Mongolia departures end Aug to end Sept, with passage direction generally SE, avoiding Himalayas and associated ranges; crosses China Sept to early Oct, main autumn passage in NE China (Beidaihe) late Aug to early Oct; scarce passage migrant in Hong Kong, mainly second half Sept, with lighter spring movement in first half Apr. In Peninsular Malaysia, autumn dates mid-Sept to late Nov, and in spring mid-Apr to late Apr; in Singapore Sept–Oct and Feb–Mar. In N Borneo recorded mid-Sept to mid-Apr, being especially common in primary forest in Oct. Spring arrival in Japan mid-Apr; end May in Mongolia, generally early Jun in Russia, following heavy passage at L Khanka in second half May. Extremely few records in Philippines. Vagrant recorded in Europe.
Status and Conservation. Not globally threatened. Common breeder in extensive range in Russia and common breeder in N Japan; generally scarce in China, only locally numerous in Korea. Records of autumn migrants in NE China (Beidaihe) suggest that the species has declined over past century. In wintering areas, fairly common throughout most of SE Asia (rather rare N Vietnam), common in Thailand; common in N Borneo, but relatively sparse elsewhere in Greater Sundas, although possibly commoner than records suggest in Sumatra (owing to relative abundance as a migrant in Peninsular Malaysia).
Bibliography. Ali & Ripley (1987b), Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Beaman & Madge (1998), Brazil (1991), Carey *et al.* (2001), Cheng Tsohsin (1964, 1987), Cramp (1988), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dickinson *et al.* (1991), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Glenister (1971), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Haneda & Horiuchi (1968, 1969), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), Lenz (2001), Lim Kim Seng (1997), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Martens & Eck (1995), Mauersberger (1980), Medway & Wells (1976), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Sheldon *et al.* (2001), Smythies (1986, 1999), Sowerby (1943), Tamura & Ueda (2000, 2001), Tomek (2002), Wildash (1968), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

234. Firethroat

Luscinia pectardens

French: Rossignol de David **German**: Davidnachtigall **Spanish**: Ruiseñor de David
Other common names: Père David's Orange-throat

Taxonomy. *Calliope pectardens* David, 1877, Paohing, eastern Xizang, China.
Sometimes placed in genus *Erithacus*. *L. obscura* was in the past sometimes treated as a colour morph of present species. Monotypic.
Distribution. S China (SE Xizang E to SW Gansu, W Sichuan and N Yunnan); non-breeding NE India.



Descriptive notes. 14 cm. Male is dull slaty from crown to rump, with blackish-brown wings, brownish-black tail with white outer bases; black on face extending across neck side to flanks, slim white upper-neck patch; rather bright orange-red chin to breast, whitish belly to undertail-coverts; bill blackish, legs plumbeous. Female is dull olive-brown above, with warm brown wing edgings, no white in tail, buffy below (slightly rustier on side of throat), white belly, very like female *L. brunnea* but less richly coloured, with longer bill and darker legs. Juvenile is dark brown, spotted stone-buff on head and over mid-brown underparts, tail as respective adult. VOICE. Song a sustained outpouring consisting of excellent mimicry intermixed with dry trills, harsh buzzy notes and sweet slurring, "wiu-wihui'wi—wi'chu-wi'chu—whi-iiii—wi-chudu'chudu—t'sii-sii—wi'chu-wi'chu-wi'chu—chu-tsri'sri". Calls include throaty "tok" in alarm.
Habitat. Breeds in montane forest and dense thickets and scrub, including bamboo, in valley bottoms and on streamsides, at 2800–3700 m. Winter record from Myanmar was at 150 m in thick streamside undergrowth.
Food and Feeding. Feeds on insects on forest floor. No other information.
Breeding. No information.
Movements. Migratory; winters in NE India. Schedule and pattern of movements to unknown. Recorded as vagrant in Bangladesh; one record from N Myanmar.

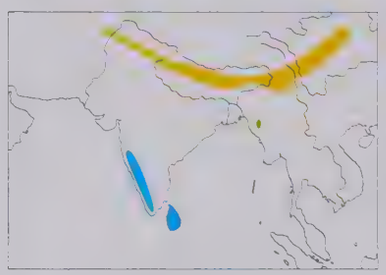
Status and Conservation. Not globally threatened. Currently considered Near-threatened. CMS Appendix II. Rare. Only recent records on breeding grounds are from Wolong Nature Reserve, in Sichuan; possibly therefore very rare, but perhaps under-recorded, as much of range remote and rarely visited by ornithologists. Habitat in both summer and winter quarters probably adversely affected by deforestation.
Bibliography. Ali & Ripley (1987b), Cheng Tsohsin (1987), Goodwin & Vaurie (1956), Grimmett *et al.* (1998), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Stattersfield & Capper (2000), Thompson *et al.* (1993), Vaurie (1972).

235. **Indian Blue Robin**

Luscinia brunnea

French: Rossignol indien **German**: Orangenachtigall **Spanish**: Ruiseñor Indio
Other common names: (Indian) Blue Chat

Taxonomy. *Larvivora brunnea* Hodgson, 1837, Nepal.
Sometimes placed in genus *Erithacus*. Two subspecies recognized.
Subspecies and Distribution.
L. b. brunnea (Hodgson, 1837) – E Afghanistan and Himalayas E to C China; non-breeding S India and Sri Lanka.
L. b. wickhami (Stuart Baker, 1916) – Chin Hills, in W Myanmar.



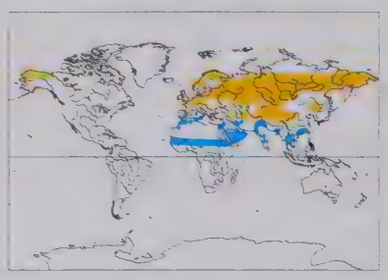
Descriptive notes. 13–15 cm; 14–20 g. Male nominate race is slaty grey-blue from crown to tail, with white supercilium, blackish of face extending across neck side; rufous-orange throat to breast and lower flanks, mid-belly to vent white; bill black when breeding, otherwise brownish with pink base; legs pinkish-brown. Female is olive-brown above, with rufescent rump, narrow buffy eyering, whitish below, with vaguely dappled fulvous breast and flanks. Juvenile is mid-brown above, indistinct buff spots on crown, buffy-white below, buff-spotted mid-brown breast and flanks. Race *wickhami* is smaller, male paler above, female pale slaty-blue above. Voice. Song, by male from deep cover all through breeding season (also in winter quarters, mainly before spring migration), a sweet jumble of rapid trilling notes, "jerri-jerri-jerri-quick-quick-quick-quick" or "chiu, chiu-chichichichi", starting softly and growing louder; presumed subsong heard once, just on spring arrival, a soft, sustained bubbling warble. Calls include hard guttural "tek" or "tuck-tuck" in alarm, and high-pitched "tsee", sometimes combined as e.g. "wee-wee-chat-chat".
Habitat. Breeds in moist closed forests, often cloudforest, with dense undergrowth of bushes, herbs, fallen logs and tangled vines, e.g. in rhododendron bushes, *Berberis*, bamboo, etc., under lower broadleaf evergreen and higher conifer (*Pinus*, *Abies*, *Picea*) forest; often in ravines or otherwise close to running water, and in Kashmir with clear preference for patches of *Viburnum* bushes in valleys, also willow *Salix* thickets. At 1600–3300 m. Winters in dank ravines and wet undergrowth along streams within evergreen forest, coffee plantations, etc., showing preference for *Rubus*, *Pandanus* and *Calamus* patches; in Sri Lanka mainly above 500 m, but regularly lower. In Myanmar, race *wickhami* inhabits thickly vegetated forest borders in alpine zone above 2000 m on Mt Victoria.
Food and Feeding. Invertebrates, including small molluscs and insects and their larvae; especially in summer, caterpillars. Forages on ground in undergrowth, with rapid hopping runs; also in low bushes.
Breeding. May–Sept in Afghanistan, May–Jul in Himalayas and May–Jun in China; Apr–May in Myanmar. Nest, sometimes small, sometimes bulky, an untidy cup of moss, dead leaves, roots and dry grass, lined with fur, hair, feathers and sometimes pine needles, well concealed on ground, on bank in shady ravine, in low tree hole or fern clump, or among roots or stones. Eggs 3–4, plain pale blue. No other information.
Movements. Summer visitor to Himalayas; winters mainly in S India and Sri Lanka, with scattered winter records from foothills. Arrives on breeding grounds in N Pakistan early to late May, departing from third week Sept; in Sri Lanka apparently young birds and females predominate, arriving mid-Oct and leaving Apr. Chinese populations has been reported to be resident, undertaking only altitudinal movements in winter, but this appears to apply only to scattered individuals. Sedentary in Myanmar.
Status and Conservation. Not globally threatened. Status possibly underestimated owing to highly retiring nature, but evidence in breeding season suggests that population density low. Locally common in N Pakistan, and common in Kashmir; locally common in Nepal and India; uncommon in China. Myanmar race *wickhami* common on Mt Victoria. In non-breeding season, fairly common most years in Sri Lanka (commoner in wet zone).
Bibliography. Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Cheng Tsohsin (1987), Grimmett *et al.* (1998), Harrison (1999), Henry (1998b), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Khan (1980), Legge (1983), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Paludan (1959), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Shivanand & Shivaprakash (2004), Smythies (1986), Vaurie (1955b, 1972), Vietinghoff-Scheel (1989).

236. **Bluethroat**

Luscinia svecica

French: Gorgebleue à miroir **German**: Blaukehlchen **Spanish**: Ruiseñor Pechiazul

Taxonomy. *Motacilla svecica* Linnaeus, 1758, Sweden and Lappland.
Sometimes placed in genus *Erithacus*. Geographical variation marked, but considerable intergradation of races. Race *saturatior* sometimes merged with *pallidigularis*; described race *tianshanica* (Pamirs, Tien Shan) synonymized with latter. Ten subspecies recognized.
Subspecies and Distribution.
L. s. svecica (Linnaeus, 1758) – Scandinavia and N Asia, and NW North America (Alaska, extreme NW Canada); non-breeding S Europe, and N & N tropical Africa, Arabia and S & E Asia.
L. s. namnetum Mayaud, 1934 – SW & C France; non-breeding SW Portugal and Morocco.
L. s. cyanecula (Meisner, 1804) – Netherlands, N & E France and N & C Spain E to Belarus and NW Ukraine; non-breeding Europe and N & N tropical Africa.
L. s. volgae (O. Kleinschmidt, 1907) – NE Ukraine and C & E European Russia; non-breeding NE Africa and SW Asia.
L. s. magna (Zarudny & Loudon, 1904) – E Turkey, Caucasus area and NW Iran; non-breeding Arabia and NE Africa.
L. s. pallidigularis (Zarudny, 1897) – plains of Kazakhstan and Transcaspia E to Tien Shan and Pamirs; non-breeding SW & S Asia.
L. s. saturatior (Sushkin, 1925) – C Asian mountains; non-breeding S Asia.
L. s. abbotti (Richmond, 1896) – N Afghanistan and NW Himalayas; non-breeding N India.
L. s. kobdensis (Tugarinov, 1929) – W Mongolia and W China (Xinjiang); non-breeding S & SE Asia.
L. s. przevalskii (Tugarinov, 1929) – C China (C & E Qinghai to Nan Shan and E to Ala Shan and Ordos Plateau); non-breeding E China.



Descriptive notes. 13–15 cm; 12–25 g. Male nominate race is grey-brown from crown to rump, blackish tail with rust-red outer bases; strong whitish supercilium bordered dark; bright blue chin to breast with red central spot, black lower border edged below with narrow white line and broadly rust-red band; buffish-white belly shading whitish to vent; bill and legs blackish. Female differs from male in having broad whitish submoustachial, black malar and whitish throat with blackish-spotted necklace, interspersed with varying (often few) traces of blue or red on breast. Juvenile is buff-streaked dark brown above and on head and breast, otherwise dark-streaked buffish with strong rust-red on tail base and rump. Races differ mainly in plumage tone and throat/breast pattern (following details refer to males): *namnetum* is short-winged, with white central breast spot; *cyanecula* has white central breast spot (sometimes lacking); *volgae* is deeper blue on chin to breast, with small white-bordered rufous spot; *magna* is large, throat all blue; *pallidigularis* is paler blue on breast, with broader, paler rufous spot; *saturatior* is similar to previous, but darker above; *przevalskii* is also very similar, but usually with larger jugular spot; *abbotti* is like nominate, but breast spot smaller, bill longer; *kobdensis* is palest race, greyer and sandier above. Voice. Song, by both sexes (chiefly male, female gives partial song), from bushtop, low tree or in short song flight (more rarely from ground, rock or wire), with peak between arrival on breeding grounds and onset of laying (snatches of song given in winter quarters); a series of phrases 10–20 seconds in length, mixing loud sweet repeated "djip-djip-djip" whistles, grating buzzing "trr-trr-trr" sounds, dry trills, hisses, jingling notes, as well as snatches of mimicry of birds, frogs and crickets. In Old World, recorded as mimicking more than 50 bird species; in America 26, including 14 Nearctic waders and passerines, and commonest motif in Alaskan songs resembles a chirping cricket. Calls include hard metallic clipped "tacc-tacc" or "shtik-shtik" for contact, and subdued "chur-r" or "turrc" and plaintive "hwiiit" like that of *Phylloscopus* warbler; sometimes combined as "hwiii-tacc" at approach of intruder near nest.
Habitat. Main requirement when breeding appears to be copious low dense vegetation (1–2 m high) with patches of open ground. Breeds in ecotone habitats between forest and plain or open areas at tree-line, including wooded tundra, mountain steppe, subalpine scrub, marshland with low woody cover, clumps of willow (*Salix*), alder (*Alnus*) and birch (*Betula*) on floodplains, riverbank thickets, reedy and shrub-dominated lakeshores, bushy sites near water. In Spain nests on dry stony slopes, and recently in Holland and France in oilseed rape (*Brassica napus oleifera*) fields bordered or intersected by dry drainage ditches; in Alps in *Rhododendron ferrugineum* heaths, except at one site where livestock resting areas (damp depressions) used. In Turkey nests in swampy thickets in mountains, in Afghanistan and NW Himalayas in dense well-grown scrub of willow and buckthorn (*Hippophae*) along rivers; in Alaska and Canada in low thickets of willow, alder, birch and ericaceous scrub, also cottongrass (*Eriophorum*) tussock tundra with scattered shrubs, usually bordering waterbodies. In Afghanistan and NW Himalayas, breeds at 2600–3800 m. In winter, similarly, found mainly in vegetation close to both fresh and salt water, in reedbeds, withered saltmarsh vegetation, mangroves, swampside and riverine thickets, clumps of wet grass, wet field margins, tidal fringes, banks of fishponds, tamarisk scrub, oases, irrigated cropfields, venturing onto muddy substrates; in W Africa typically in *Mimosa pigra* thickets, and in Ethiopia in rank streamside herbage above 1900 m; in Arabian Peninsula in palm groves, reedbeds and well-watered fields, e.g. alfalfa. In India skulks in perennial shrubbery of larger gardens. In SE Asia commonly found in paddy stubble, resting in bush during midday heat.
Food and Feeding. Primarily invertebrates, chiefly insects, with some seeds and fruit in autumn. Insects include adult and larval beetles of many families, various hymenopterans (including ants, sawflies and ichneumons), adult and larval flies (notably Tipulidae, Chironomidae and Culicidae), mayflies, stoneflies, caddis flies, caterpillars, bugs, earwigs, grasshoppers, bush-crickets and dragonflies; other invertebrates include spiders, sandhoppers, shrimps, small snails and earthworms; only vertebrate prey recorded are young frogs. Plant matter includes seeds or fruits of dock and knotweed (Polygonaceae), strawberries (*Fragaria*), blackberries (*Rubus*), bird cherry (*Prunus padus*), alder buckthorn (*Rhamnus*), elder (*Sambucus*), wheat and legumes. Stomachs of 47 breeding birds from Kirghizstan held ants (in 25), caterpillars, and mostly adult beetles; beetles, large dipterans and hymenopterans taken in Alaska and E Siberia. Food brought to nestlings in Russia mainly beetles, spiders and larval sawflies (c. 20% by number of each), and further sampling in same area yielded 23% larval sawflies, 23% tipulid flies, 19% flies, 14% lepidopterans, remainder unknown; moth caterpillars brought to nest in Sweden, and in Belgium mainly earthworms but also tipulid flies, probably small crustaceans and two young *Rana* frogs. In India, recorded winter food water-beetles, water-snails, weevils, caterpillars and flies. Feeds on ground and in low vegetation, gleaning from stems and low leaves; occasionally catches flying insects. In winter hops about at water's edge, skulking among wet reeds and bushes.
Breeding. Late Apr to Jul in C Europe, from late May in Scandinavia; early Apr to Jun in Armenia; Jun–Jul in Ladakh; May–Jul in China; May/Jun–Aug in North America; single-brooded in Arctic, two broods in C & S Europe. Monogamous, but 5–15% cases of polygyny and considerable extra-pair copulations; in one study 33% extra-pair paternity in broods and in another 64%, while a third study found extra-pair paternity broods to be unevenly distributed in clusters; female does not show aggression to male intruder, and regularly moves outside mate's territory during pre-laying and fertile period. Territorial, but overlap between defended areas often considerable, and boundaries frequently appear flexible; mean inter-nest distance in Norway 119 m. Nest a deep cup of leaves, small twigs, dry grass, rootlets, plant down and moss, sometimes lined with animal hair, set among grass and scrub on wet ground, commonly associated with (and gaining partial shelter from) topographic feature such as hummock, gulley, lip of bank, or tussock. Eggs 4–7 (3–4 in Ladakh), pale blue to olive-green or olive-brown with reddish-brown freckling; incubation period 13 days; nestling period 13–14 days; post-fledging dependence up to one month, probably usually shorter; adults may divide brood if second breeding attempt made. Of 120 eggs laid N Finland, 77% hatched and 74% of hatchlings fledged, giving overall succes rate of 57·5% and mean 4·45 young fledging per nest; success of second nest increases with distance from first nest; first-time breeders less successful than older pairs, owing to behavioural and physiological immaturity (reflected mainly in brood-feeding rates).

Movements. Migrant. Timing of autumn migration correlated significantly with timing of breeding, suggesting that S movement starts as soon as possible after breeding and moult. Leaves N Scandinavia late Aug, peak passage SE Sweden early Sept. Average daily movement 100–110 km for adults, initially only 30–65 km for juveniles, but increasing to nearly 100 km later in autumn. Race *cyanecula* moves SW, passing E of Pyrenees (*namnetum* to W), some present in SE Spain late Aug to Mar, extended passage Aug–Nov; some nominate race move S, but many head SE through C Asia to winter in SW Asia, and little evidence of SW movement. Both races occur throughout African non-breeding range, but relative abundance and centres of distribution unclear; in general, *cyanecula* commoner in W, nominate in E. In N Africa, *cyanecula* commoner on passage, and almost all birds wintering there are *cyanecula* (also *namnetum* in Morocco), also in Senegal and mainly in Mali and Chad. Most winterers in N Nigeria are nominate, but the two races appear equally numerous in Sudan and Ethiopia. Race *namnetum* overwinters mainly on Portuguese coast, especially around Tagus estuary. Race *magna* (SW Asia) occurs in only small numbers in NE Sudan and Ethiopia, while *volgae* has been recorded in Africa only in Egypt, otherwise in Middle East. Main autumn passage dates in N Africa and on Red Sea coast from mid-Sept to Nov; Israel mainly mid-Oct to end Nov, UAE (where winters) Sept with main influx end Oct. Reaches Senegal mid-Sept, Mali Oct–Nov, Nigeria early Dec, Chad Oct (nominate in Nov). Main departure dates Mar to late Apr; in Israel passage chiefly end Feb to early Apr, in UAE passage of *magna* Apr, in Bahrain Feb–Apr. In S Asia, nominate race winters throughout region, although all races become scarce farther S in India, while *pallidigularis* is an abundant wintering bird in NW and in N plains; passage birds in Afghanistan presumably consist of both these races; status and range of other races unclear. At Beidaihe (NE China) main autumn passage mid-Sept to mid-Oct, but only a rare vagrant farther N (Korean Peninsula); in Hong Kong a locally common winter visitor and spring passage migrant, great majority of records from second third Nov to second third Apr, and peaks end Dec to start Jan and from mid-Mar to mid-Apr. In S Myanmar abundant from early Nov to mid-May. Nearctic breeders presumed to winter in SE China; known to migrate in spring through St Lawrence I and Bering Strait, arriving on breeding grounds late May to mid-Jun, with departure from Aug.

Status and Conservation. Not globally threatened. European population in mid-1990s estimated at 545,126–1,376,505 pairs (great majority in Norway, then Sweden and Finland), with additional 100,000–1,000,000 pairs in Russia and 500–1000 pairs in Turkey; at that time Spain held 9000–12,800 pairs, with only minor concerns that habitat may be becoming unsuitable with decline in grazing. By 2000 total European population (including European Russia and Turkey) revised to 4,500,000–7,800,000 pairs, and considered generally stable. Rich subalpine birch–meadow habitat in far N Europe holds up to 0·5 pair/ha (50 pairs/km²) and in some years reaches 89 pairs/km², while in French Alps (Savoie) up to 60 pairs/km² recorded, and in marshland in Netherlands as many as 3–4 pairs/ha (300–400/km²); such densities reflect optimal habitat, which is often only patchily or linearly distributed, and are probably variable among years. Densities elsewhere or over larger areas c. 5–20 pairs/km². Fluctuations in populations in temperate Europe in 20th century essentially unexplained: major decline in Netherlands in 1930–1970 seemingly explicable by natural succession, reed-cutting and farming practices, but recovery since 1970 (800 pairs) to 1990 (5500–7500 pairs) took place without reversal of these circumstances. Breeding-range expansions now also in France, Belgium, Germany, Austria, Czech Republic and Slovakia, suggesting that conditions outside Europe may be responsible. In Germany, however, growth in numbers in Coburg (Bavaria) due to colonization of vegetation around washponds in gravel plants and of reeds and scrub in farmland drainage ditches; population will collapse unless habitat managed to contain succession at these sites. Structure of vegetation in areas where species increasing in Belgium and Spain similar, but explanation unavailable. Expansions in France involve both *cyanecula* (spreading S) and *namnetum* (N), with contact made between them at Mont Saint-Michel Bay; traditional saltpan management benefits the species in this region. Recent gains in Austria need to be set against substantial losses through drainage since 19th century; decline in Austrian Neusiedlersee population (now c. 70 pairs) related to stabilization of lake levels, successional loss of reed-belt, and occupation of secondary habitats on arable land (where nest predation elevated). Few data from rest of global range; common breeder in Afghanistan and NW Himalayas, and fairly common, probably locally common, in C & E Asia. Possibly no longer breeding in Canada.

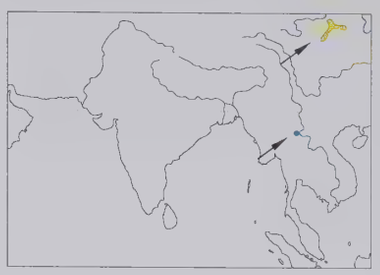
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237. **Black-throated Blue Robin**

Luscinia obscura

French: Rossignol à gorge noire **Spanish**: Ruiseñor Gorginegro
German: Schwarzkehlnachtigall
Other common names: Black-throated Robin, Blackthroat

Taxonomy. *Larvivora obscura* Berezowski and Bianchi, 1891, Gansu, China.
Sometimes placed in genus *Erithacus*. Has in the past been treated as a colour morph of *L. pectardens*. Described form *Heteroxenicus joannae*, later placed in *Brachypteryx*, is a synonym of present species. Monotypic.
Distribution. Breeds EC China (SE Gansu, S Shaanxi and N Sichuan).



Descriptive notes. 12·5–14·5 cm. Male is bluish-slate from crown to rump, uppertail-coverts black, tail black with white outer bases; face to breast black, rest of underparts white, except for yellowish belly; bill black, legs pinkish-grey. Female is like female *L. cyane*, but lacks blue on rump, has rufous tinge in tail, unscaled below, buffy vent. Juvenile apparently unknown. Voice. Song a series of rather shrill cheerful phrases, e.g. "wh'ri-wh'ri" and "chu'ti-chu'ti", alternating with purring trills, e.g. "hdrriii-ju'ju" and "uu ji'uu". Calls include subdued "tup" in contact.
Habitat. Uncertain. Recorded in breeding season in bamboo thickets on ridgetops at 3050–3350 m, and in temperate forests; winter records in or near secondary forest at 400 m.
Food and Feeding. No information.
Breeding. Four unfledged young found in Aug; breeding-condition female in Feb was on migration to breeding grounds; nesting probably May–Aug. No other information.
Movements. Summer visitor to breeding areas. Non-breeding range uncertain; records from S China and N Thailand in Feb, Mar and May, possibly also Dec.
Status and Conservation. VULNERABLE. CMS Appendix II. Restricted-range species: present in Central Sichuan Mountains EBA. Global population placed at 2500–10,000 mature individuals, and considered to be declining in response to logging and conversion of temperate forest to farmland. Paucity of records suggests that few breeding sites exist; in recent review, eight localities mapped, of which six are in breeding range and only three of these known to involve post-1980 records. Main threat probably destruction and fragmentation of habitat in breeding quarters, where extensive areas of deciduous forest assumed to have been lost since 1960s. Known from Jiuzhaigou (200 km²) and Baihe (200 km²) Nature Reserves, in Sichuan, and Taibai Shan National Nature Reserve (563 km²), in Shaanxi; forests here in good condition, but stronger enforcement of laws needed; may also occur in certain other reserves established for giant panda (*Ailuropoda melanoleuca*). Detailed study of ecology required to establish habitat usage, elevational range and population status.
Bibliography. Cheng Tsohsin (1987), Collar *et al.* (2001), Deditius (1897), Dresser & Morgan (1899), Goodwin & Vaurie (1956), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Ripley & King (1966), Robson (2000), Stattersfield & Capper (2000), Vaurie (1955b).

238. **Rufous-headed Robin**

Luscinia ruficeps

French: Rossignol à tête rousse **German**: Rotkopfnachtigall **Spanish**: Ruiseñor Cabecirrojo

Taxonomy. *Larvivora ruficeps* Hartert, 1907, Tai Pai Shan, Tsinling Mountains, China.
Sometimes placed in genus *Erithacus*. Monotypic.
Distribution. Breeds EC China (S Shaanxi S to N Sichuan).



Descriptive notes. 15 cm; 18 g. Male has rufous-chestnut crown, ear-coverts and nape; black from lores and mid-eye to neck side and across upper breast, enclosing broad white chin and throat; slate-grey upperparts and slightly paler mid-breast, shading below to white belly to vent; tail blackish, rufous-chestnut bases of outer rectrices; bill blackish, legs pale pinkish. Female is like female *L. cyane*, but ear-coverts darker, throat stippled dark, flanks more grey than buff, and tail with rufous (not dull blue) tinge. Juvenile apparently undescribed. Voice. Song a series of well-spaced, powerful, rich phrases, e.g. "ti cho chuk'uk'uk ti tch-wr'rr'rr ti chi-wru-w'r'r'r'r ti chr'r'r'r ti chr'riu'iu'iu". Calls include deepish "tuc" or "toc" and soft thin "si".
Habitat. Breeds in temperate mixed coniferous and deciduous forest and deciduous scrub, particularly with narrow river valleys, at 2400–2800 m; apparently replaced by *L. brunnea* at lower elevations. Recently recorded in dry streambeds in mixed coniferous and broadleaf forest with dense bamboo and scrub, also a valley with fast-flowing stream, numerous boulders and rich herb layer with many deciduous shrubs and some open mud patches, bordered by birch–conifer stands admixed with bamboo. May be specialized on areas of successional scrub in river-valley bottoms where flooding removes mature trees; seen to favour moss-covered vegetation in woodland and shrubs on valley floor. Winter habitat uncertain; single record is from ericaceous scrub at 2030 m.
Food and Feeding. Earthworm and plant fragments found in one stomach; no other information on diet. Forages in part on ground; male once seen to feed on area of exposed mud on valley floor produced by trampling cattle.
Breeding. May–Aug. One nest 0·5 m up in mossy fork in small tree. No other information.
Movements. Recorded in China mid-May to Aug, indicating potentially extensive time spent in other, unknown regions. Single record away from breeding area: an individual apparently on passage in mountains of Peninsular Malaysia, in Mar.
Status and Conservation. VULNERABLE. CMS Appendix II. Restricted-range species: present in Central Sichuan Mountains EBA. Global population placed at 2500–10,000 mature individuals, and considered declining. Known from only five sites, four in breeding quarters (three of these known to be occupied post-1980) and one during non-breeding winter period. Paucity of records certainly suggests that few, if any, other breeding sites exist, and that habitat preferences may be narrow. Main threat probably destruction and fragmentation of forest in breeding quarters, where extensive areas of deciduous forest assumed to have been lost since 1960s. Within current small range, felling and lopping of trees (inside a nature reserve) is occurring, and elsewhere, if species is dependent on successional vegetation, flood-control dams may have seriously reduced habitat. If this species uses lowland rainforest in winter (which seems unlikely), it may be more seriously affected by extensive loss of this habitat in past half-century. Known from Jiuzhaigou (200 km²) and Wanglang (332 km²) Nature Reserves, in Sichuan, and Taibai Shan National Nature Reserve

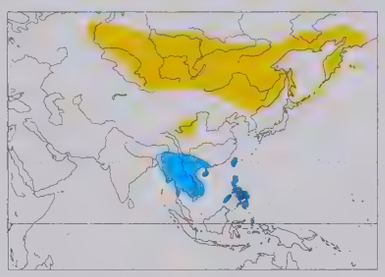
(563 km²), in Shaanxi; forests in good condition, but stronger enforcement of laws needed; may also occur in some other reserves established for giant panda (*Ailuropoda melanoleuca*). Detailed study of ecology required to establish habitat usage, elevational range and population status.
Bibliography. Cheng Tsohsin (1987), Collar *et al.* (2001), Hartert (1907a, 1907b), Jeyarajasingam & Pearson (1999), Li Guiyuan & Zhang Qingmao (1987), MacKinnon & Phillipps (2000), McClure (1963), Medway & Wells (1976), Meyer de Schauensee (1984), Robson (2000), Stattersfield & Capper (2000).

239. **Siberian Rubythroat**

Luscinia calliope

French: Rossignol calliope **German**: Rubinkehlchen **Spanish**: Ruiseñor Calíope
Other common names: Rubythroat, Red-necked Nightingale

Taxonomy. *Motacilla Calliope* Pallas, 1776, between the Yenisei and the Lena Rivers, Russia.
Sometimes placed in genus *Erithacus*. Vocalizations very similar to those of *L. pectoralis*, and apparent intermediacy of race *tschebaiewi* of latter suggests that a single species may be involved. Geographical variation weak and clinal; proposed E races *camtschatkensis* and *beicki* considered unwarranted. Monotypic.
Distribution. C Ural Mts and Siberia E to Anadyr, Kamchatka, Commander Is, S to N Mongolia, N Korea, N Japan and Kuril Is, also C China (NE Qinghai, SW Gansu, N Sichuan); non-breeding S & SE Asia, Taiwan and Philippines.



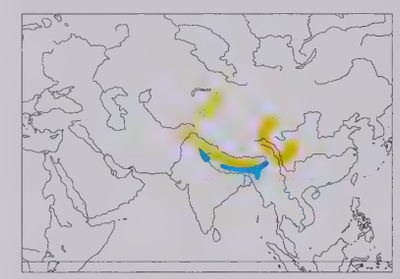
Descriptive notes. 14–16 cm; 16–29 g. Male breeding is warm olive-brown from crown to tail, with bold white supercilium and submoustachial stripe, black lores and malar line; metallic pale ruby-red chin and throat bordered below by narrow blackish line linking malars; ashy-grey neck side and breast shading whitish on belly and buffy on flanks; bill blackish, legs greyish-flesh; male non-breeding has breast more solidly grey, bill all black. Female is like male but facial pattern less distinct, chin whitish, shading to yellow-tinged buff on throat and breast (sometimes with partly ruby throat). Juvenile is very like juvenile *Erithacus rubecula* or *L. megarhynchos*. Voice. Song, started before spring departure for breeding grounds, a low, rapid, musical warble comprising squeaky, chortling, jangly silvery, metallic, harsh and a few clear musical notes, with much mimicry, "chil chil chil-li chilli" and so on; more melodious than that of *L. svecica*, sometimes considered as fine as *L. megarhynchos* song. Calls include short harsh nasal "ché", "tshuk" or "chakh" in mild (probably territorial) agitation, sometimes followed by snatches of plaintive whistling song; short musical downslurred "svee-eek" or "chee-wee", not unlike call of *L. cyane*; harsh churr in alarm; in Japan commonest call is "cu-ééé", second syllable higher and stressed, and elsewhere reported as loud whistling "tiuit-tiuit", this sometimes combined with "chakh" call as "huiit-tak-tak".
Habitat. Breeds in lowland taiga and subalpine shrubbery, clearings in forest by meadows and rivers, windfall gaps, regenerating burns with tall grass and bushes, birch coppices, clumps and stands of willow and aspen in bogs, patches of montane dwarf pine, krummholz above tree-line, overgrown forest edges and tangled thickets near mountain streams; especially in areas with fallen trees, dense bushes and stands of bird cherry (*Prunus padus*) and dog rose (*Rosa canina*), usually near fir (*Abies*) and spruce (*Picea*) stands and riverine meadows. In N Japan also in coastal grassland with bushes and scattered shrubs. In winter, found in dense thickets and scrub (notably the introduced *Eupatorium odoratum* in Myanmar), abandoned cultivation, bamboo brakes, dense roadside vegetation, hedges near villages, regrowth on old fields, long grass, reeds, tea gardens, town gardens, and field margins, often near streams or standing water; in duars and foothills up to 1500 m in Himalayas.
Food and Feeding. Insects, including flies and their larvae, ants, wasps and beetles; also plant material. In May, China, 88·5% of food consisted of insects, including beetles and mosquitoes, the rest plant matter; stomachs of E Russian birds held insects (largely beetles) and their larvae, while birds on Sakhalin I took seashore amphipods (*Gammarus*). Food brought to nestlings comprised adult and larval hymenopterans, adult and larval beetles, adult and larval flies, spiders, molluscs, bugs, stoneflies, adult and larval lepidopterans, an adult dragonfly and a myriapod. Forages mainly on ground, taking items from hard surfaces; also gleans from lowest parts of reeds, grass clumps and bushes. In winter quarters, noted often to be most active in twilight. Males hold winter territories.
Breeding. In Russia May–Jul, possibly Aug, main laying period early Jun and main fledging period mid-Jul; fledglings Jun in Mongolia; May–Jul in China and N Korea; Jun–Aug in Japan; single-brooded. Nest a loose cup or dome made of fine grasses and roots, usually lightly lined with hair and plant down, placed on ground in shelter of bush or dense tuft of herbage, in Japan e.g. wild rose (*Rosa rugosa*) and stone pine (*Pinus pumila*). Eggs 4–6 (3–5 in Japan), bluish-green sometimes with brown spots. No other information.
Movements. Migrant, moving through Mongolia, China, Korea and Japan to winter quarters mainly in SE Asia from NE India E to Philippines. W populations probably move E initially, to avoid high mountain ranges, before turning S; passage migrant (may occur at 4000 m) and winter visitor, Sept–Apr, in E Himalayan foothills, straggling to Rajasthan and farther S. Exodus from breeding areas starts late Aug, complete by mid-Sept in N areas and by early Oct in Transbaikalia. Main autumn passage in Mongolia Sept, in NE China (Beidaihe) mid-Sept to mid-Oct; records in Hong Kong generally end Oct to end Apr, and in Philippines Oct to early May. Reportedly abundant in S Myanmar Nov–Jan. Passage in Japan mainly late Oct to mid-Nov and late Apr to early May. Arrives back in Mongolia and in S Russian breeding range middle to late May, but in N not until late May or early Jun. Casual winter visitor to Palau. Vagrants recorded Europe, North America (Alaska), Malaysia and New Guinea.
Status and Conservation. Not globally threatened. Common across extensive range in Russia, where densities variously measured include 15–26 (locally up to 40) pairs/km² in broadleaf woodland, 31–73 birds/km² in conifer and broadleaf forest, 53–61 birds/km² near glades and 31 birds/km² in riverine willows; inexplicably absent in some areas of apparently appropriate habitat. Along E coast of Moneron I (off Sakhalin) as many as 300–400 pairs/km² (3–4 pairs/ha) reported, but this highly abnormal. Rare breeding species in N Korea. Common (locally abundant) in Kuril Is and N Japan (Hokkaido, N Honshu). Numbers of autumn migrants at Beidaihe (NE China) no longer substantial, indicating possible decline over past century. In mid-20th century reportedly a great favourite with Chinese bird-fanciers owing to colourful plumage and voice, but impact of trade unknown; long considered at best uncommon in winter in S China, but possibly greatly overlooked. In winter, fairly common to common throughout most of SE Asia, but uncommon in Philippines; uncommon in winter in E Himalayas.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Anon. (2000a, 2004e), Austin (1948), Austin & Kuroda (1953), Baker (1951), Barthel (1996), Beaman & Madge (1998), Bent (1949), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1964, 1987), Cramp (1988), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dickinson *et al.* (1991), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Glutz von Blotzheim & Bauer (1988), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Herklots (1967), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (1993, 2000), Mauersberger (1980), Medway & Wells (1976), Meyer de Schauensee (1984), Mohr (1997), Piechocki *et al.* (1982), Pratt *et al.* (1987), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986, 1999), Sowerby (1943), Tomek (2002), Vaurie (1955b, 1972), Williams (2000), Zheng Guangmei & Zhang Cizu (2002), Zysk (1991).

240. **White-tailed Rubythroat**

Luscinia pectoralis

French: Rossignol à gorge rubis **German**: Bergrubinkehlchen **Spanish**: Ruiseñor Pechinegro
Other common names: Rubythroat, Black-breasted Rubythroat, Himalayan Rubythroat

Taxonomy. *Calliope pectoralis* Gould, 1837, Western Himalayas.
Sometimes placed in genus *Erithacus*. Vocalizations very similar to those of *L. calliope*; race *tschebaiewi* appears intermediate between nominate race and that species, suggesting that a single species may be involved. Geographical variation somewhat clinal. Four subspecies recognized.
Subspecies and Distribution.
L. p. ballioni Severtsov, 1873 – Tien Shan S to S Tadjikistan (Pamir range) and NE Afghanistan; non-breeding S Asia.
L. p. pectoralis (Gould, 1837) – SE Afghanistan and NW Himalayas E to C Nepal.
L. p. confusa Hartert, 1910 – E Nepal and Sikkim.
L. p. tschebaiewi (Przevalski, 1876) – N Kashmir, S, E & NE Tibetan Plateau, C China (N & NW Sichuan, NW Yunnan) and N Myanmar; non-breeding NE India.



Descriptive notes. 14–16 cm; 20–26 g. Very like *L. calliope*, except that brown replaced by grey. Male nominate race has prominent white supercilium, deep red chin and upper throat; black from face to throat side and across breast, rest of underparts whitish, tinged pale grey on flanks; tail black, outer feathers with white bases and tips. Female is darker and greyer than female *L. calliope*, with white throat, white-tipped dark tail. Juvenile as juvenile *L. calliope*. Race *ballioni* male is paler above, female more olive above; *confusa* male is blacker above, with more white on forehead, female darker grey on ear-coverts and breast; *tschebaiewi* male is distinctive, has slightly larger area of ruby on throat, white submoustachial, blacker central tail feathers, female throat streaked grey. Voice. Song, from exposed perch (heard also in winter, when seemingly slower), a loud, shrill series of variable undulating warbling phrases consisting of rapid jingling twittery notes, like that of an accentor (*Prunella*) or *Saxicola*, lasting 3–4 seconds, sometimes much longer. Calls include short thin downslurred whistle, "fyeww", female having double note, "skut-fweeep"; in various states of excitement or alarm a harsh "ke", yapping "skyap", dry abrupt "shzuk" and repeated "it, it".
Habitat. Breeds in semi-open alpine and subalpine landscapes above tree-line, such as tall grass thickets in meadows, dwarf rhododendron patches, low *Rosa sericea* bushes, willow, furze, juniper and wormwood scrub, usually with many scattered boulders or adjacent bare screes, and often near water in alpine zone; 2600–4800 m, in Myanmar 3600–4400 m. Winters in lowlands in dense scrub, tea gardens, thickets and grass jungle near streams.
Food and Feeding. Insects (especially caterpillars in summer), spiders, molluscs and small reptiles. In Tien Shan, nine of 14 stomachs held ants and eight contained weevils, with other beetles also found. Adults deliver soft-bodied prey (lizards, larvae) to nestlings, while taking harder-bodied insects themselves. Forages mainly on ground in cover.
Breeding. May–Jun in Tien Shan and Pamirs–Alai; May–Aug elsewhere. Nest a domed structure with large open side entrance, made of dry grass, lined with finer grass, concealed under shrubs or among rocks or roots, or low in vegetation. Eggs 3–5, blue-green with faint ring of reddish freckles; incubation period 13–14 days; nestling period 15 days. Frequently parasitized by Common Cuckoo (*Cuculus canorus*).
Movements. Nominate race and *confusa* make altitudinal and latitudinal movements, wintering in adjacent foothills, terai and duars along C Himalayas; presumably *ballioni* occupies W part of subcontinent. Race *tschebaiewi* winters from terai of E Nepal E to Assam and NE Bangladesh; apparently resident in Myanmar.
Status and Conservation. Not globally threatened. Generally common, and very common in N Pakistan. Uncommon breeder in mountains of Tien Shan and Pamir–Alai. Locally common in E Himalayas. Scarce in Myanmar.
Bibliography. Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Cheng Tsohsin (1987), Dementiev *et al.* (1968), Flint *et al.* (1984), Gavrilov & Kovshar (1970), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Kovshar (1979), Landmann & Winding (1993), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Paludan (1959), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Vaurie (1972).

PLATE 72 ➤



PLATE 72

inches 4

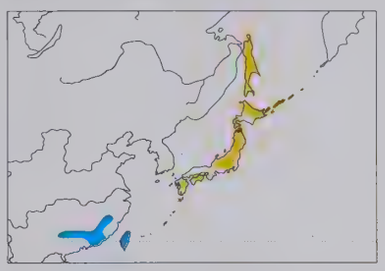
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241. **Japanese Robin**

Luscinia akahige

French: Rossignol akahigé **German**: Rostkehlnachtigall **Spanish**: Ruiseñor Japonés

Taxonomy. *Sylvia akahige* Temminck, 1835, Hondo Japan.
Often placed in genus *Erithacus*. Two subspecies recognized.
Subspecies and Distribution.
L. a. akahige (Temminck, 1835) – Sakhalin, S Kuril Is and Japan; non-breeding SE China and Taiwan.
L. a. tanensis (Nagamichi Kuroda, 1923) – Izu Is and islands off S Kyushu, in Japan.



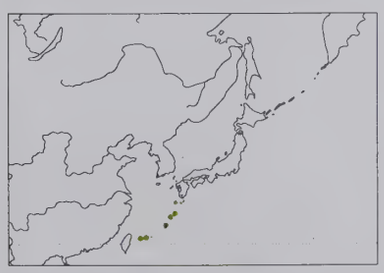
Descriptive notes. 14–15 cm. Male nominate race is olive-tinged fulvous-brown from crown to rump, with more rufous tail; face and neck side to breast orange-rufous with clear-cut narrow sooty lower breastband, shading whiter to vent; bill blackish, legs pinkish-brown. Female is like male, but rufous-orange much duller, browner and less extensive, with dull grey breastband, olive-grey flanks. Juvenile is like adult above and on tail, with slight pale rufous flecking from crown to mantle, rufous-buff below, breast with darker spotting. Race *tanensis* is darker above, female throat paler and duller orange. Voice. Song (in one study 79% of time at 0–2 m off ground, 15% from treetop) a series of simple, well-spaced, quavering or trilled phrases (likened to ringing of telephone), "hiii ch'h'h'h'h hii-tu ch'i'i'i'i'i hiii ch'h'h'h'h ts-tii ch'u'u'u'u'u tsii chuk'chuk'chuk" and so on; female heard to sing weakly during nest-building and incubation in response to male, but male song much reduced once eggs laid. Calls include thin metallic "tsip" and short chatter.
Habitat. Damp dense shady undergrowth along streams in broadleaf evergreen montane forest, mixed conifer–broadleaf forest and deciduous forest (e.g. *Betula*, *Phellodendron amurense*, *Ulmus effusa*, *Quercus* and *Alnus*), in *Sasa*-dominated underbrush in old-growth forest; sometimes in parks and gardens, and on passage in bamboo clumps. Generally 1000–2500 m (chiefly 1300–2100 m) on Honshu and Shikoku, 600–1600 m on Hokkaido; lower still on Izu Is, but at 1100–1600 m on Yakushima (where *L. komadori* occupies lower areas). Race *tanensis* also found in *Cryptomeria* forest.
Food and Feeding. Beetles in winter in China. Forages on ground and low bushes; comes out on to footpaths.
Breeding. May–Jun on Sakhalin, to mid-Jul in Japan; in study in C Japan, one of eight pairs double-brooded. Nest made of moss, twigs, dry leaves, ferns and roots, lined with leaves and rootlets, placed on sloping ground or steep bank, also in hollow tree on Izu Is. Eggs 3–5, pale greenish-blue; incubation period 12–14 days in one account, 15 days in another; in captivity nestling period 12 days, young tolerated for 31 days before attacked by parents.
Movements. Migrant. Autumn departure from highland areas of Japan late Aug, from lower elevations Sept–Nov, mainly Oct. Migrates along E coast of Asian continent to winter in S China; considerable numbers recorded on Shawaishan I in autumn, but scarce in Hong Kong (late Nov to late Mar). Spring arrival in Japan from mid-Apr, reaching Kurils mid-May. Vagrant or occasional in Korean Peninsula, Thailand and Indochina.
Status and Conservation. Not globally threatened. Locally common in Japan; race *tanensis* common. Until mid-20th century, at least, a popular cagebird in Japan, but no information on impact.
Bibliography. Anon. (2000a), Austin & Kuroda (1953), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Declair (2003, 2004), Dementiev *et al.* (1968), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Gore & Won Pyongoh (1971), Haneda & Kudo (1976), Jahn (1942), Lee Woo-Shin *et al.* (2000), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Robson (2000), Sowerby (1943), Tomek (2002), Vaurie (1955b), Vietinghoff-Scheel & Wunderlich (1977), Zheng Guangmei & Zhang Cizu (2002).

242. **Ryukyu Robin**

Luscinia komadori

French: Rossignol komadori **German**: Samtkehlnachtigall **Spanish**: Ruiseñor de Okinawa
Other common names: Korean/Temminck's Robin

Taxonomy. *Sylvia komadori* Temminck, 1835, northern Ryukyu Islands and Tanegashima, Japan.
Often placed in genus *Erithacus*. Proposed race *subrufa* (Yaeyama Is), described from non-breeding individuals, is synonymous with nominate. Two subspecies recognized.
Subspecies and Distribution.
L. k. komadori (Temminck, 1835) – N Ryukyu Is (Tanegashima S to Tokunoshima).
L. k. namiyei (Stejneger, 1886) – Okinawa.



Descriptive notes. 14 cm. Male nominate race is rich fulvescent-rufous above; black face and breast, lower breast with narrow white scalloping, white below with black flank patch; bill black, legs pinkish. Female is like male but duller above, whitish below, greyish on breast and flanks with darker scaling at tips. Juvenile is like adult above, dirty whitish below with vague dark scaling, male with white-freckled blackish throat and buff lower breast. Race *namiyei* has white of underparts tinged smoky-grey. Voice. Song resembles that of *L. akahige* but more musical and varied; reported as of two types, "teet-see teet-see too", and "seeet-seeet zeeto-zeeto seeet-tsi-ti-ti-ti-took"; female heard to sing weakly during nest-building and incubation in response to male song. Calls include high penetrating "tsiiii" for contact and "kirrick" in alarm.
Habitat. Damp dense shady undergrowth (bamboos, bushes, particularly ferns) of broadleaf evergreen forest, with strong preference for small streams, at 100–200 m and higher above valley floors, venturing out into forest edge and onto tracks and roads in early morning. At 200–600 m on Yakushima I, where *L. akahige* at 1100–1600 m.
Food and Feeding. Forages on ground. No other information.
Breeding. Apr–Jun; May–Aug on Nakano-shima, with peaks mid-May and mid-Jun. Territorial and site-faithful. Nest made of dried bamboo leaves and moss, placed in hollow in bank or tree, sometimes in nestbox or inside building. Clutch 3–5 eggs, pinkish. Snakes thought to prey on nests and young. No other information.
Movements. Sedentary on Amami (nominate) and Okinawa (*namiyei*); elsewhere apparently migratory over short distances.
Status and Conservation. Not globally threatened. Restricted-range species: present in Nansei Shoto EBA. Common on Tokara Is and Amami, scarce on other islands; race *namiyei* locally common on Okinawa. Total population estimated at 100,000 birds. Steep declines reported from some islands. Formerly caught for cagebird trade. Nestbox use extensive, with 103 of 298 boxes occupied in 1990 on Nakano-shima (Tokara Is).
Bibliography. Anon. (2000a), Austin & Kuroda (1953), Brazil (1991), Higuchi *et al.* (1990), Jahn (1942), Kawaji & Higuchi (1989), MacKinnon & Phillipps (2000), Moulton & Sanderson (1997), Vaurie (1955b), Vietinghoff-Scheel (1988).

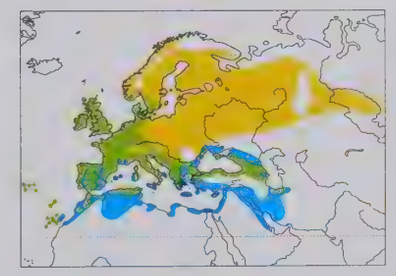
Genus *ERITHACUS* Cuvier, 1800

243. **European Robin**

Erithacus rubecula

French: Rougegorge familier **German**: Rotkehlchen **Spanish**: Petirrojo Europeo
Other common names: Robin, Robin Redbreast, Redbreast

Taxonomy. *Motacilla Rubecula* Linnaeus, 1758, Europe = Sweden.
It has been suggested that Canary Is race *superbus* merits treatment as a separate species, with birds on Gran Canaria proposed as a separate race ("*marionae*") on grounds of considerable genetic isolation; this species status, however, is based on very minor levels of differentiation, and taxonomic distinction between the two populations probably not justified without confirmatory differences in morphological characters. Geographical variation extremely slight, with considerable intergradation among W races; *valens* and *caucasicus* sometimes merged with *hyrcanus*. Other described races are *armoricanus* (described from NW France), *sardus* (Sardinia) and *balcanicus* (W Turkey), all synonymized with nominate. Eight subspecies recognized.
Subspecies and Distribution.
E. r. melophilus Hartert, 1901 – British Is; non-breeding also SW Europe.
E. r. rubecula (Linnaeus, 1758) – Continental Europe E to Ural Mts and W Asia Minor, also islands in E Atlantic (Azores, Madeira, W Canary Is) and NW Morocco; non-breeding W & S Europe and NE Africa.
E. r. tataricus Grote, 1928 – Urals and SW Siberia; non-breeding SW Asia.
E. r. superbus Koenig, 1889 – C Canary Is (Tenerife, Gran Canaria).
E. r. witherbyi Hartert, 1910 – N Algeria and N Tunisia.
E. r. valens Portenko, 1954 – S Crimea.
E. r. caucasicus Buturlin, 1907 – E Turkey and Caucasus area; non-breeding also Middle East.
E. r. hyrcanus Blanford, 1874 – SE Azerbaijan and N Iran; non-breeding also Middle East.



Descriptive notes. 14 cm; 14–25 g. Nominate race is olive-brown above, with orange face and breast fringed by band of pale blue-grey on neck side to breast side; buff lower flanks and white belly to vent; bill blackish, legs pinkish-brown. Sexes similar. Juvenile is extensively mottled brown and buff. Race *melophilus* is warmer and darker above, deeper orange-rufous on face and breast, darker buff flanks; *witherbyi* is like previous but smaller; *superbus* is dark greyish-olive above, wider ash-grey band from crown side to breast side, still deeper orange-rufous below, belly and vent whiter, with somewhat different wing shape; *valens* is slightly paler than nominate, with rufous uppertail-coverts and tail base; *caucasicus* is like nominate but slightly browner above, with rufous uppertail-coverts and tail base; *hyrcanus* is longer-billed, browner above, rufous-orange below, with rufous-chestnut uppertail-coverts; *tataricus* is paler and greyer above, paler orange below. Voice. Song, all year, a series of highly variable phrases, each consisting of thin high silvery whistling that typically mixes a short melodious warbled passage and several long-drawn but fading notes, rarely with some mimicry. Song in autumn to late winter (by both sexes) differs from that in spring (almost entirely by male) in being quieter, with longer phrasing and more melancholy tone; songs during fights have more strangled, slurred quality, and often repeat same phrases. Birds in Canary Is have somewhat simpler songs. Subsong (both sexes) a subdued complex rambling warble, incorporating more obvious mimicry than full song. Calls include irregularly repeated staccato "tic" in excitement, often associated with territorial defence (can become rapid crackling tittering in greater excitement: "tic, tic, tikerititititit, tikerititititititit, tic, tic..."); thin "tswiiii" in contact-alarm; high sharp thin "tsiiip" or "sssiiip" in alarm; high piercing "siii" in aggression; soft high "dziip" for contact and by food-begging female; hissing high "seep" or "sweezeezeez" by female as being fed, with similar call during copulation; thin metallic "peep" when foraging; soft sibilant "sip" or "sissip" from nocturnal migrants; and various churrs.
Habitat. Forest undergrowth and edge, preferring conifer tracts in some parts of range and deciduous woodland in others; copses and adjacent open land, farmland woodlots, thickets along watercourses, hedgerows with some tall trees, orchards, gardens and parks; key requirements for long-term

On following pages: 244. Red-flanked Bush-robin (*Tarsiger cyanurus*); 245. Rufous-breasted Bush-robin (*Tarsiger hyperythrus*); 246. White-browed Bush-robin (*Tarsiger indicus*); 247. Collared Bush-robin (*Tarsiger johnstoniae*); 248. Golden Bush-robin (*Tarsiger chrysaeus*).

site-occupancy are cool shade, medium-height cover with perches, and patches of bare ground. In urban areas in parts of Europe. Breeding habitat in NW Africa mainly montane forest (Atlas cedar and oak) with thick undergrowth (*Viburnum*, *Ilex*, *Erica*), humid leaf litter and dead wood, sparsely at 700–1000 m, commonly 1000–2000 m, rarely higher. Non-breeding migrants in N Africa and Middle East occupy woodland, farmland, dense macchia, large gardens, orchards and plantations. Keeps to open undergrowth.

Food and Feeding. Invertebrates, fruits and seeds; also very small vertebrates (including fish and lizards), carrion, left-overs and birdtable foods. Invertebrates include adult and larval beetles of many families, adult and larval flies of many families, ants, bees, sawflies, crickets, grasshoppers, bugs, earwigs, thrips, adult and larval butterflies and moths; also spiders, mites, woodlice, sandhoppers, millipedes, centipedes, small molluscs, earthworms. Fruits and seeds include juniper (*Juniperus*), yew (*Taxus*), spurrey (*Spergula*), strawberry (*Fragaria*), apple (*Malus*), cherries (*Prunus*), cotoneaster (*Cotoneaster*), oleander (*Olea*), pistachio (*Pistacia*), spindle (*Euonymus*), sea buckthorn (*Hippophae*) buckthorn (*Rhamnus*), rowan (*Sorbus*), bramble (*Rubus*), current (*Ribes*), bilberry (*Vaccinium*), elder (*Sambucus*), viburnum (*Viburnum*), honeysuckle (*Lonicera*), dogwood (*Cornus*), oak (*Quercus*), vine (*Vitis*), wild vine (*Ampelopsis*), privet (*Ligustrum*), mistletoe (*Viscum*) and nightshade (*Solanum*). In S Spain, sample of birds in holm oak (*Quercus ilex*) woods in winter (Oct–Feb) yielded 1900 invertebrates, of which 76% ants, 12% beetles, and 12% larvae and earwigs *Forficula*, but birds also took pieces of acorn (varied monthly from 16·5% by volume to as much as 78%); sample of birds in farmland (Nov–Jan) yielded 300 invertebrates, of which 73% ants, 15% beetles and the rest berries (26–42% by volume); and at highland locality fruits of *Pistacia lentiscus* formed 31% of plant diet, *Phillyrea latifolia* 19% and *Viburnum tinus* 6%, while at lowland site *Pistacia lentiscus* rose to 89%. In another study in Mediterranean scrub, S Spain, fleshy fruits of nine plants (*P. lentiscus* most important) plus acorn endosperm varied 53–77·5% in diet volume over three winters, and at least 89% of individual diet samples contained at least some fruit; monthly averages of fruit volume varied inversely with arthropod abundance, but reliance on food apparently a response to fruit availability (not arthropod scarcity), and body condition of birds unaffected by different levels of fruit consumption. In Germany, individuals in hedgerow habitats took 60% beetles, supplemented by flies, millipedes and spiders; majority of prey small, 2–6 mm in length. Main foods of spring migrants in Russian Baltic were beetles, ants, myriapods and spiders; in Crimea in summer, stomachs contained 39% beetles, 16% hymenopterans (majority ants), 15% millipedes, 8% bugs, 6% caterpillars, among others; in Armenia in winter, stomachs held beetles (of at least seven families), bugs, ants, caterpillars and plant material. Two main foraging methods: perching on low lookout post (bush, branch, fence) in open or partially open areas and flying down to take prey from ground, returning to same or similar perch; and pursuing and taking prey in hopping gait on ground in sheltered vegetation (this strategy increasing in colder weather). Occasionally sallies after flying insects. In N Europe a frequent visitor to birdtables, where very fond of bread. Will follow animals such as Ring-necked Pheasant (*Phasianus colchicus*) and mole (*Talpa*) for invertebrates disturbed by their passage; renowned for habit of accompanying gardeners digging soil. Takes items from streams and margins of pools and creeks, sometimes foraging in intertidal zones; recorded as catching insects by artificial light. Male strongly territorial all year; female defends separate area in winter. Size of winter territory in Britain 0·43 ha, in Israel 0·6–1 ha; in N Africa c. 300 birds in 1 km² indicates similar values.

Breeding. Mainly early Apr to mid-Jun in British Is; end Apr to late Jul in C Europe; from mid-May in N Russia and mid-Apr in S; late Apr to early Aug in S Caucasus region (Armenia); mid-Mar to Jun in Canary Is; May–Jul in Morocco and Apr–May in Algeria; single-brooded in N of range, elsewhere two broods, rarely three. Breeding territory in Britain average 0·84 ha, in Canary Is 0·9–1·5 ha. Nest a cup of moss, grass, leaves and twigs, lined with fine grass and hair, placed on bulky mat of leaves and always sited in recess, usually in low undergrowth, hedge, grass bank, wall, rock face, tree cavity, tree roots, nestbox, usually low down, not above 5 m and fairly often on ground under tussock; very fond of ivy-clad walls and tree trunks for nesting. Eggs 4–7 (4–5 in Algeria), whitish or bluish-white (whitish-pink in race *superbus*) with small reddish spots; incubation period 12–21 days, mostly c. 14 days; nestling period 10–18 days, generally c. 13 days; post-fledging dependence 16–24 days. In Britain, 71% of 1400 eggs and 77% of hatchlings fledged, giving overall success 55% (overall success 53% in Mar–Apr, 61% in May, 46% in Jun–Jul). In Britain, annual adult mortality 62%, yearling mortality from 1st Aug 72%; annual overall mortality in Finland 76%, in Europe as a whole 58–62%; mortality rates from Belgian ringing data 0·71 in first year and 0·54 after first year (only 1% of birds recovered after fourth calendar year); causes of mortality of ringed birds in NW Europe are domestic predator 50%, human-related (accidental) 32%, human-related (deliberate) 4%, other 14%. Age of first breeding 1 year. Recorded longevity more than 8 years.

Movements. Poorly understood. In general, populations E of line from Norway and Sweden S to C Europe are full migrants, moving S to Mediterranean Basin, Black Sea hinterland, S Caspian, Mesopotamia and Gulf region (although races *caucasicus* and *hyrcanus* are partial and/or vertical migrants); those W of line from Germany to Balkans partially migratory or largely resident (sedentary on Canary Is, with little vertical movement). In British Is partial migration occurs (main passage mid-Aug to end Oct, peak early Oct), as indicated by male bias in wintering population, suggesting that females migrate (69–77% of males in four study areas sedentary), but distribution of migrants uncertain, although most seem to move short distances and fewer than 5% emigrate; spring passage less notable and extending late Feb to May. Birds from N Europe wintering in Spain keep mainly to S & E (especially Balearic Is), with 75% of birds immigrating mid-Oct to mid-Nov. Individuals ringed in Poland migrate to broad area of Mediterranean, from Iberian Peninsula E to Balkans; autumn passage on N Polish coast mid-Aug to early Nov, peak late Sept, although birds in N Norway linger into early Oct, and those in Russia (Urals, Moscow) usually vacate breeding areas late Sept to mid-Oct. Scandinavian and Russian birds of nominate race appear to winter in W half of Europe and N Africa. Birds ringed in Belgium recovered 2400 km S (N Saharan fringes) and 1700 km N, average speed during long-distance displacements 100 km/day; most Belgian birds winter in SW Europe, and about half of Belgian wintering population composed of immigrants. One study in Switzerland found that first-years start their passage c. 20 days before adults. In Italy autumn stopovers longer than spring ones. Resident NW Africa, and no evidence of altitudinal movement. Also abundant winter visitor to N Africa; autumn passage of N European (and possibly Mediterranean) birds from late Sept (sometimes earlier), peak Oct, birds present in region until Mar; records at Saharan oases mostly late Dec to Mar. Passage in Syria from end Oct and in Mar; in Israel mainly Nov and Mar. Spring passage in N Africa starts Feb, with peak mid-Mar to early Apr, last leaving by late Apr (earlier in W than in E); Cyprus largely vacated by mid-Apr, and some higher sites in Alps not reoccupied until early May, about same time as return to N Scandinavian sites.

Status and Conservation. Not globally threatened. European population in mid-1990s judged stable and estimated at 32,387,823–42,974,703 pairs, with estimated additional 10,000,000–100,000,000 pairs in Russia (apparently W of Urals) and 10,000–100,000 pairs in Turkey; population in Spain then assessed at 1,200,000–3,000,000 pairs and probably stable or growing. By 2000, total European population (including European Russia and Turkey) revised to 43,000,000–83,000,000 pairs and considered stable. Densities in Europe may reach 1 pair/ha (100 pairs/km²) in good woodland habitat and suburban gardens, but drop to one-third of this level in farmland with small fields and hedgerows. Relatively scarce resident in NW Africa; 25·8 pairs/km² in Morocco. Often abundant in winter in N African coastal zone, e.g. 62 birds/km² in hillside macchia and 250/km² in mixed woodland in Algeria, and 130/km² in mixed countryside in Morocco; also frequent to common in Libya and along Egyptian coast to W Sinai, where up to 50/km²; scarce S of coastal zones. Winter density of 2·6 birds/ha (260/km²) found in semi-natural woodland in city park in Rome (Italy), very close to the figure for mixed woodland in Algeria. No pressing conservation issues, but many individuals still caught and killed for food in Mediterranean Basin in winter.

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Genus *TARSIGER* Hodgson, 1845

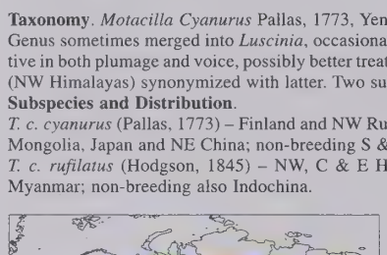
244. **Orange-flanked Bush-robin**

Tarsiger cyanurus

French: Rossignol à flancs roux **German**: Blauschwanz **Spanish**: Ruiseñor Coliazul
Other common names: Red-flanked Bluetail/Bush-robin, Blue-tailed Robin, (Siberian) Bluestart

Taxonomy. *Motacilla Cyanurus* Pallas, 1773, Yenisey, Russia.
Genus sometimes merged into *Luscinia*, occasionally into *Erithacus*. Race *rufilatus* rather distinctive in both plumage and voice, possibly better treated as a separate species. Proposed race *pallidior* (NW Himalayas) synonymized with latter. Two subspecies recognized.

Subspecies and Distribution.
T. c. cyanurus (Pallas, 1773) – Finland and NW Russia, and from Ural Mts E to Kamchatka, S to N Mongolia, Japan and NE China; non-breeding S & SE Asia.
T. c. rufilatus (Hodgson, 1845) – NW, C & E Himalayas E to C & S China, probably also N Myanmar; non-breeding also Indochina.



Descriptive notes. 13–15 cm; 10–18 g. Male nominate race is deep blue above, with brighter blue crown side, shoulder, rump and tail base, narrow whitish supercilium; white chin to vent, slightly buffy on breast, broadly orange-rufous flanks; bill and legs blackish; in autumn, much browner on crown, back and wings. Female is olive-brown above, blue on rump and tail, white bib set in buffy-brown face and breast-band, shading to white ventrally, with orange-rufous flanks. Juvenile is mid-brown, spotted buff, with plain rufous-tinged wings, grey-blue tail and orange-tinged flanks; first-winter male as female; year-old male not fully blue above, but capable of breeding. Race *rufilatus* is larger, marginally longer-tailed than nominate (some overlap), male darker blue above with usually pale blue (sometimes white) supercilium, whiter on breast, female and first-winter male colder brown, with weaker breastband, brighter blue rump. Voice. Song, by male from near top of bush or low branch, throughout day in early breeding season, also in last weeks on wintering grounds), of two types, both short and sweet, rising and then falling, first type vibrant and rolling "tree trr-tretritt", second clear and melodious "whew-wee-whew-wee-wee-wellu-it"; *rufilatus* song simpler and softer (seemingly similar to first song type of nominate). Female heard to sing weakly during nest-building and incubation in response to male song, and apparent subsong reported in spring in China. Calls include soft mournful "heed" (upslurred in nominate) or "pheeou" (downslurred in *rufilatus*) in contact-alarm, and low throaty frog-like "tok-tok-tok" or "kr-kr-kr", the two often combined.

Habitat. Breeds in Siberia in taiga forest, with preference for old-growth mossy moist spruce (*Picea*) tracts with fallen trees and sparse undergrowth, often on hilly slopes, but also pine (*Pinus*) and mixed forests with birch (*Betula*) and rhododendron; birchwoods increasingly used in E parts of range, where even dwarf birch at 3000 m occupied. In Himalayas in bush layer (dwarf rhododendron in wetter areas, deciduous bushes in drier) of conifer and mixed conifer–oak forest, main species fir (*Abies*) but sometimes in areas with *Picea smithiana* or *Pinus wallichiana*/*Cupressus torulosa* forest; at 3000–4400 m, not penetrating beyond tree-line, but generally in higher, drier habitat than ecologically rather similar *Luscinia brunnea*. In China breeds in damp montane forest and in scrub in secondary forest. In Japan breeds in subalpine evergreen and deciduous forest with dense undergrowth near streams, and in open birch woodland to tree-line, 1500–2300 m; down to near sea-level in pine forests in E Hokkaido. In winter in broadleaf evergreen forest, dense dark undergrowth and thickets, clearings, treefall gaps with vine tangles, open woodland; commonly seen along tracks; favours ridges and mountain tops.

Food and Feeding. Little studied. Invertebrates, mainly insects; also fruits and seeds when not breeding. Stomachs of Russian breeders held beetles and their larvae, caterpillars and a spider. In late summer and autumn, Russia, takes fruits of buckthorn (*Hippophae*), *Aralia* and *Euonymus*. In one study of

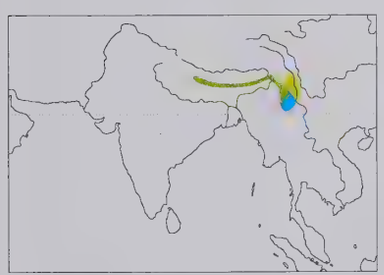
race *rufilatus* in China (apparently summer), 81% of food consisted of caterpillars, bugs, beetles, flies and other insects, the rest spiders, fruit and grass seeds; in another, stomachs held small beetles, ground bugs, flies and (autumn) berries. In Himalayas, *rufilatus* recorded as taking caterpillars, ants, wasps and dock (*Polygonum*) seeds. Craneflies seen caught in flight and fed to nestlings. Forages on ground and in low bushes, often making short flycatcher-like sallies after flying insects.
Breeding. May–Aug in Russia, May–Jul in Himalayas, Mongolia and China, end Jun to mid-Aug in N Korea, and May–Aug in Japan; at least occasionally double-brooded, apparently regularly so in Pechora basin, in Russia (first broods fledged late Jun, second by mid-Aug). Nest a cup of grass, moss, ferns, twigs and roots, lined with hair, feathers, fine grass and sometimes pine needles, placed in hollow of tree, among tree roots, under rotten log or in hole in bank or steep slope. Eggs 3–7 (4–5 in Japan), pure white or with few pink or reddish-brown speckles; incubation period 15 days; nestling period 15 days. Male breeds at 1 year.
Movements. Nominate race migratory in most of range; in C & S Japan some merely undertake altitudinal movements to lowlands. Finnish and Russian populations evidently make long movement E or SE to avoid Himalayas and associated ranges, before turning S; N summer quarters deserted by mid-Sept, some lingering in S Siberia into early Oct, crossing Mongolia and China Oct. Autumn passage Korean Peninsula from early Sept to mid-Nov (mainly Oct), with spring return mid-Mar to mid-May (mainly Apr). In Japan a common passage migrant Oct–Dec. In China, main autumn passage at Beidaihe (NE) late Sept to early Nov; present in Shanghai area Oct–Apr, in Hong Kong mainly late Nov to mid-Mar but highest numbers Jan–Feb (indicating mid-winter influxes), in SE Yunnan Nov–Apr, and on Hainan Jan–Feb. Present in N Myanmar Oct–Apr (to mid-May). Spring return commences Apr, reaching S Siberia (e.g. L Khanka) in second half Apr and spreading N & W during May, reaching extreme NW of breeding range in late May to early Jun. Race *rufilatus* an altitudinal migrant in Himalayas, with post-breeding descent to 1500–2500 m; farther N & E migratory, reaching Thailand and Indochina. Vagrants recorded in W Europe, also in NW North America.
Status and Conservation. Not globally threatened. In Europe, Finnish population usually of only few pairs (varies annually), and in Russia W of Urals population in mid-1990s estimated at only 100–1000 pairs, despite W expansion in 1940s which led to colonization of Finland. By 2000 total European population (including European Russia) revised to 10,000–21,000 pairs, but trend unknown. Nominate race common in much of range, e.g. common breeder in Kuriles and N Japan (Hokkaido), rarer farther S. Common to abundant autumn migrant at Beidaihe, in NE China, with no indication of decline over past century. Common in Himalayas.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Anon. (2000a, 2004e), Austin (1948), Austin & Kuroda (1953), Bates & Lowther (1952), Beaman & Madge (1998), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1964, 1987), Cramp (1988), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Glutz von Blotzheim & Bauer (1988), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Herklots (1967), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Landmann & Winding (1993), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Mauersberger (1980), Meyer de Schauensee (1984), Piechocki *et al.* (1982), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Sowerby (1943), Tomek (2002), Vaurie (1955b, 1955c, 1972), Wildash (1968), Williams (2000), Zheng Guangmei & Zhang Cizu (2002).

245. Rufous-breasted Bush-robin

Tarsiger hyperythrus

French: Rossignol à ventre roux **Spanish**: Ruiseñor Pechirrufo
German: Rostbrust-Blauschwanz

Taxonomy. *Ianthia hyperythra* Blyth, 1847, Darjeeling, India.
Genus sometimes merged into *Luscinia*, occasionally into *Erithacus*. Monotypic.
Distribution. C & E Himalayas and S China (SE Xizang, NW Yunnan); probably breeds N Myanmar.



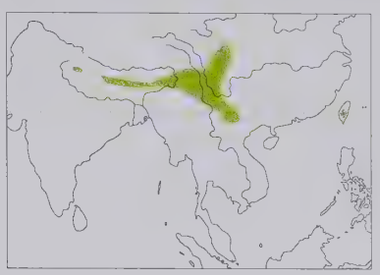
Descriptive notes. 12–13 cm; 11–16 g. Male is dark royal blue above, with blackish face (including malar), paler shining blue forehead and supercilium, shoulder and rump; fulvous-orange from chin to mid-belly and flanks, white mid-belly to undertail-coverts; small bill black, legs blackish. Female is warm olive-brown above and to malar, with bright blue tail-coverts, blue-black tail, long narrow buff throat stripe, broad buff eyering, broad ochre-brown breastband shading to orange-tinged flanks, white lower underparts. Juvenile is very like juvenile *T. indicus*, but with no supercilium, shorter tail. Voice. Song reportedly a simple lisping warble, "zeew zee zwee zwee" or "te rree treyre". Calls include low "duk" in warning, extending to "duk-duk-duk-squeak".
Habitat. Breeds in heavy mixed conifer forest, mainly *Abies densa* mixed with tree rhododendron, and in dwarf rhododendron and scattered birch (*Betula*) above timber-line, at 3400–3800 m in Himalayas; winters in broadleaf evergreen forest glades and edges, especially along streams and mule roads, foothills to 3500 m in Himalayas, 1300–1500 m farther E. In summer, during heavy snowfall, may seek temporary shelter in lower forest clearings and yak pastures.
Food and Feeding. Insects. Forages on ground.
Breeding. Nestlings being fed in May in Nepal. No other information.
Movements. Altitudinal migrant in Himalayas; apparently a short-distance migrant in China.
Status and Conservation. Not globally threatened. Scarce in E Himalayas; rare in China. Fairly common in N Myanmar in Feb; probably breeds, but this not confirmed.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Thompson *et al.* (1993), Vaurie (1972).

246. White-browed Bush-robin

Tarsiger indicus

French: Rossignol à sourcils blancs **Spanish**: Ruiseñor Cejudo
German: Weißbrauen-Blauschwanz

Taxonomy. *Sylvia indica* Vieillot, 1817, Darjeeling, India.
Genus sometimes merged into *Luscinia*, occasionally into *Erithacus*. Geographically remote race *formosanus* distinctive, possibly better treated as a separate species, particularly if shown to differ vocally; taxonomic assessment, however, complicated by fact that this race thought to have hybridized with *T. johnstoniae*. Three subspecies recognized.
Subspecies and Distribution.
T. i. indicus (Vieillot, 1817) – C & E Himalayas.
T. i. yunnanensis Rothschild, 1922 – S China (W Sichuan S to N Yunnan), N Myanmar and N Vietnam (W Tonkin).
T. i. formosanus Hartert, 1909 – mountains of Taiwan.



Descriptive notes. 13–15 cm; 16 g. Male nominate race has bluish-slate face and forehead to tail, with long white supercilium, sometimes trace of narrow white malar; dull orange from chin to vent, with whitish mid-belly; bill blackish, legs dark reddish-brown. Female is dull olive-brown above, with buffish-white supercilium and eyering, orange-buff below, whitish mid-belly. Juvenile is dark brown with buff streaking above, buff with brown scaling below, vague buff supercilium; year-old male may lack blue feathering, but capable of breeding. Race *yunnanensis* has paler throat, yellower underparts, vent greener; *formosanus* male is like nominate above, but with ochre-tinged olive crown diffusing onto mantle, no white malar, pale olive below, female like nominate but greyer above, light yellowish below. Voice. Song, from small tree, sometimes from ground, a series of identical fast and rapidly following phrases consisting of undulating wispy slurring yet staccato "whi-wi'wich'u-wi'rr" or "shri-de-de-de...de-de-dew" or "wí-u widípwiu wí-u widípwiu". Calls include sweet rising "heed" or "tuit-tuit" in warning, and distinctive click-like croaking churr, "trrr" or "kr kr kr", the two often combined; in alarm a low rapid clucking in short phrases that first rise in pitch (to stressed syllable) and at end drop back, "tukukukúkukukukukukuk".
Habitat. Breeds in dense lower bush storey of heavy mixed broadleaf and conifer forest, mainly rhododendron and *Abies*, mixed subalpine birch, cane jungles at and beyond tree-line, rocky forested ravines, at 3000–4200 m; winters in undergrowth of saplings and bracken in heavy damp forest, 2000–3000 m.
Food and Feeding. Feeds mainly on ground, on insects.
Breeding. Apr–Jul in India. Territory c. 3 ha (diameter 150–200 m). Nest a cup placed in hollow in bank. Eggs 3–4, white (usually) with pale pink freckles. No other information.
Movements. Altitudinal migrant.
Status and Conservation. Not globally threatened. Locally common in E Himalayas; uncommon in China. Rather scarce to rare in Myanmar and N Indochina.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Severinghaus (1984), Smythies (1986), Vaurie (1972).

247. Collared Bush-robin

Tarsiger johnstoniae

French: Rossignol de Johnstone **German**: Taiwanblauschwanz **Spanish**: Ruiseñor de Formosa
Other common names: Formosan/Johnstone's Bush-robin

Taxonomy. *Ianthia johnstoniae* Ogilvie-Grant, 1906, Mount Morrison, 8000 feet [c. 2440 m], Taiwan.
Genus sometimes merged into *Luscinia*, occasionally into *Erithacus*. May hybridize with race *formosanus* of *T. indicus*. Monotypic.
Distribution. Mountains of Taiwan.



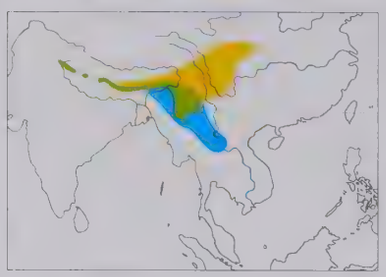
Descriptive notes. c. 12 cm. Male is greyish-black above and to throat, with white supercilium from lores back to rear of ear-coverts, metallic rusty-chestnut breastband extending around neck and splitting into broad line down scapulars; greyish-buff below breast, shading to whitish belly and vent; bill black, legs brown. Female is virtually identical to female *T. indicus* of race *formosanus*, but often yellower below, sometimes dark marks on throat. Juvenile is reportedly very similar to that of *T. indicus*; adult plumage acquired after c. 70 days. Voice. Song, by male, a series of short jolly whistled phrases, e.g. "wíwí s-wízuwu wíwí s-wu-wí wíwí s-wu-srrr". Calls include curious mix of high piping and *Acrocephalus*-type grating, "sipsipsip grrgrrgrr sipsip grrgrr".
Habitat. Mixed evergreen broadleaf forest. Recorded in summer 2600–3900 m, mainly 2000–2800 m; in winter 1600–2800 m, rarely as low as 800 m.
Food and Feeding. Ants, moths, small beetles and other insects, also spiders and worms. Of food brought to nestlings in one study, 98% was animal and 2% berries. Forages mainly in lower storeys and commonly on ground in shaded areas.
Breeding. Late Mar to mid-Aug. Nest a cup made of moss, grass roots, dead leaves and bits of man-made fibre (such as nylon rope), placed low in thick patch of vegetation, preferably in bamboo on slope. Eggs clear greenish-blue. Incubation period 14–15 days; nestling period 18–19 days. Nests closer to roads and tracks less successful than those placed farther away, perhaps owing to disturbance or predation.
Movements. Sedentary; some slight vertical movement in winter.
Status and Conservation. Not globally threatened. Restricted-range species: present in Taiwan EBA. Fairly common to abundant within small range. No evidence of decline in numbers.
Bibliography. Chang James Wanfu (1993), Cheng Tsohsin (1987), Liu (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Severinghaus (1984), Zheng Guangmei & Zhang Cizu (2002).

248. Golden Bush-robin

Tarsiger chrysaeus

French: Rossignol doré **German**: Goldschwanz **Spanish**: Ruiseñor Dorado

Taxonomy. *Tarsiger chrysaeus* Hodgson, 1845, Nepal.
Genus sometimes merged into *Luscinia*, occasionally into *Erithacus*. Two subspecies recognized.
Subspecies and Distribution.
T. c. whistleri Ticehurst, 1922 – NW Himalayas.
T. c. chrysaeus Hodgson, 1845 – C & E Himalayas E to C China (SE Xizang, E to S Shaanxi, S to N & W Yunnan) and W & N Myanmar; non-breeding also N India and S to N Thailand.



Descriptive notes. 14–15 cm; 12–15 g. Male nominate race is brownish-olive from crown to back, broad bright orange-yellow supercilium, scapulars, rump to tail side and entire underparts (most intense from chin to breast), with blackish mask, wings and centre and tips of tail; bill dark above, yellowish below; long legs olive-yellow. Female is duller and much less variegated, lacks black mask and orange-yellow on scapulars, has smaller and duller yellow supercilium, orange-yellow eyering, upperparts olive-tinged golden-brownish, some orange on tail side, buffish-orange underparts. Juvenile is dark brown with buff streaks above and below, tail as adult in male, pattern diffuse in female. Race *whistleri* is paler above and below than nominate. Voice. Song, from hidden perch in dense low bushes (reportedly from prominent perch in Pakistan), a hurried wispy trill-like "tze'du'tee'tse" ending with lower rolling "tew'r'r'r". Calls include a soft rattling "trrr'rr" or a hard grating "chit-t-it" and a harder "check".
Habitat. Breeds in fairly diverse array of highland habitats, occupying open patches with bamboo and shrubbery, second growth and undergrowth within entire fir-dominated coniferous belt up to tree-line, penetrating also bushy and dwarf rhododendron zone, willow (*Salix*) stands along streams; also bush-free open alpine pastures, where favours steep stony hillsides; 3000–4600 m in Himalayas, 3000–3600 m farther E. Winters in dense damp undergrowth of evergreen forest, foraging also in stubble of shifting cultivation, at 1400–2000 m; down to 600 m in China and Bhutan, above 1900 m in Thailand.
Food and Feeding. Invertebrates, mainly insects. Forages on ground or in lower parts of shrubbery, often making short aerial sallies after flying prey.
Breeding. May–Jun in Pakistan. Nest a compact saucer of moss and grass, lined with hair, wool or feathers, placed in hole in bank or steep slope. Eggs 3–4, plain pale verditer-blue; nestling period reportedly 14–15 days. No other information.
Movements. Altitudinal migrant, probably with some short-distance winter dispersal. Winter visitor to NE India (S Assam hills) and Myanmar; scarce or rare non-breeding visitor N Thailand, recorded also in N Vietnam (W Tonkin).
Status and Conservation. Not globally threatened. Rare and local resident in Pakistan; locally common in C & E Himalayas, common in Bhutan; uncommon in China.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Land (1970), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Vaurie (1955b, 1972), Zheng Guangmei & Zhang Cizu (2002).

PLATE 73 ➤


inches 4
cm 10
PLATE 73
ssp leucosticta
249
ssp reichenowi
ssp quadrivirgata
ssp greenwayi
250
251
252
253
254
ssp leucophrys
ssp zambesiana
ssp eluta
ssp familiaris
255
ssp galactotes
ssp paena
256
ssp benguellensis
257
ssp podobe
258
ssp melanoptera
ssp albospecularis
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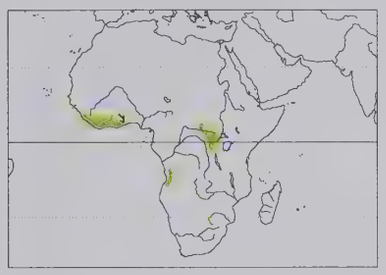
Genus *ERYTHROPYGIA* A. Smith, 1836

249. Forest Scrub-robin

Erythropygia leucosticta

French: Agrobate du Ghana **German**: Waldheckensänger **Spanish**: Alzacola Selvático
Other common names: Northern Bearded/Moustached Scrub-robin, Western Bearded Robin; Gold Coast Scrub-robin (nominate); Colls's Ground Robin (*collsi*)

Taxonomy. *Cossypha leucosticta* Sharpe, 1883, Accra, Ghana.
Genus often merged into *Cercotrichas*. Has been thought to form a superspecies with *E. quadrivirgata*, *E. barbata* and *E. signata*, and these four recently separated by some authors in genus *Tychaedon*. Four subspecies recognized.
Subspecies and Distribution.
E. l. colstoni (Tye, 1991) – Sierra Leone (Kambui Hills) and Liberia.
E. l. leucosticta (Sharpe, 1883) – Ivory Coast and Ghana.
E. l. collsi Alexander, 1907 – SE Central African Republic, NE DRCongo and W Uganda.
E. l. reichenowi Hartert, 1907 – Huila Escarpment, in W Angola.



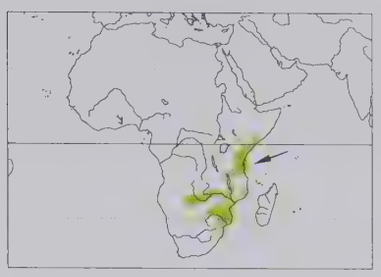
Descriptive notes. 15–16·5 cm; 21–31 g. Bold facial pattern involving white supercilium, subocular crescent, submoustachial and chin to throat, dark brown crown, black lores, grey-brown cheek and malar. Nominate race is dark brown above, wings brown with olive-brown edgings, white patches from carpal to primary bases, chestnut rump, white-tipped blackish tail; buff-grey breast, shading to ochre flanks and white belly to vent; bill black, legs pinkish. Sexes presumed similar (female nominate undescribed). Juvenile nominate apparently undescribed. Race *colstoni* is slightly darker above than nominate, dark rufous-brown rump, dirtier white below, female slightly smaller than male, juvenile scaled black above and below, with rufous-spotted lesser wing-coverts; *collsi* is like nominate but rump rufous-olive, breast pure grey, flanks olive-grey; *reichenowi* resembles previous, but paler above and below, more white on tail. Voice. Song a prolonged series of varied phrases lasting 3–5 seconds, consisting of very melodious, high warbling, alternately rising and falling, then stopping abruptly; no mimicry. Calls include high rapid "chit-chit-chit" in alarm, and irregular "chuck" when foraging, perhaps as contact.
Habitat. Understorey of primary lowland forest, often near large termitaria (at least in C Africa). In Liberia also forestry plantations, farmbush, dense secondary coastal scrub, and fire-generated secondary scrub at montane forest edge. In Angola in escarpment forest, secondary forest, and regenerating shade coffee. In Ivory Coast, in forestry plantations. At 1100 m to at least 1600 m in Liberia, 40–1100 m in Angola; recorded from 1300 m in DRCongo.
Food and Feeding. Invertebrates, mainly insects such as black ants, termites, beetles, caterpillars and grasshoppers, also small millipedes, amphibians and snails. Forages on ground, making sharp hopping runs and abrupt pauses to look for prey. Attends driver-ant swarms.
Breeding. Only one nest found, in DRCongo, indicating eggs laid in Mar, but gonads of specimens suggest breeding there also Sept–Oct, and Aug–Sept in Liberia; fledgling Jul in Ghana; breeding-condition bird Jun in Central African Republic. Nest was a small open cup of thin dry plant stems and leaves, placed 1·6 m up in small cavity in trunk beside an elephant trail; contained one nestling. No further information.
Movements. Sedentary, so far as known.
Status and Conservation. Not globally threatened. Uncommon to frequent. As many as 18 collected around Mt Nimba, in Liberia, indicating probably reasonable numbers in some parts of range; its extreme shyness would tend to create impression of considerable rarity. Vulnerable to forest loss. Occurs in Taï Forest National Park, in Ivory Coast.
Bibliography. Allport (1991), Bannerman (1953), Borrow & Demey (2001), Chapin (1953), Colston & Curry-Lindahl (1986), Dean (2000), Demey & Fishpool (1991, 1994), Demey & Rainey (2004), Gartshore *et al.* (1995), Gatter (1997), Grimes (1987), Keith *et al.* (1992), Lippens & Wille (1976), Oatley (1998), Plumptre & Mutungire (1996), Ryan *et al.* (2004), Sinclair & Ryan (2003), Sinclair *et al.* (2004), Thiollay (1985), Traylor (1962), Tye (1991), Walker (1939).

250. Bearded Scrub-robin

Erythropygia quadrivirgata

French: Agrobate à moustaches **Spanish**: Alzacola Bigotudo
German: Streifenkopf-Heckensänger
Other common names: Eastern Bearded Scrub-robin; Zanzibar (Bearded) Scrub-robin (*greenwayi*)

Taxonomy. *Thamnobia quadrivirgata* Reichenow, 1879, Kipini, lower Tana River, Kenya.
Genus often merged into *Cercotrichas*. Has been thought to form a superspecies with *E. leucosticta*, *E. barbata* and *E. signata*, and these four recently separated by some authors in genus *Tychaedon*. Formerly treated as conspecific with *E. barbata* on basis of convergence of characters (apparently including vocal) in S Zambia and W Tanzania, and still not fully clear that separate species status is appropriate; reported overlap in these areas requires documentation, although no evidence of hybridization and the two have distinct habitat preferences. Record of apparent hybridization with *E. signata* in S of range. Two subspecies recognized.
Subspecies and Distribution.
E. q. quadrivirgata (Reichenow, 1879) – C & SE Kenya and S Somalia S to NE Namibia and E South Africa.
E. q. greenwayi Moreau, 1938 – Zanzibar and Mafia I, off E Tanzania.
Descriptive notes. 16 cm; 21–31 g. Resembles *E. leucosticta* but paler above, with dark rufous rump, larger tail spots, orange-cinnamon on breast and flanks; head pattern emphasized by blackish borders



of white markings; bill black, legs brownish-pink. Sexes similar, male slightly larger. Juvenile is like adult, but scaled dark above and below. Race *greenwayi* is more grey-brown above than nominate, with more olive rump, breast and flanks washed buff. Voice. Song, mostly from concealed perch in undergrowth, less often high perch, a series of varied phrases consisting of very melodious whistling, deliberate or fast-paced, incorporating usually little mimicry, series a few seconds to more than 2 minutes, between often long (up to 19 seconds) pauses; each series prefaced by 3 slow whistles, "why wuuu wiiii", then "wurk-wurk oodle-ee-ee-oo churrchurr wurkilee-ee-ee wurkelee-eeo-eeo" (when slow), or "tsee-chiu wit-wi, twe-twe-twe, witu-witu, chiu-chiu, t-t-t-teu, weet-chrrrr weet chickitseet" (when fast); ventriloquial, songster often difficult to detect; both sexes sing, male much more frequently, at start of breeding at intervals throughout morning and early afternoon and again at sunset. Calls include loud "chuk" in contact; in alarm quiet, distinctive "chek-chek-kwezzzzzzz" or "chak-kwezzzzzzzz", first note(s) sharp, last a long-drawn buzzing churr; in anxiety high, descending "siiiip".
Habitat. Dry and moist sand forests and other evergreen (especially riverine) forest, *Afzelia* forest (Arabuko-Sokoke Forest, in Kenya), *Baikiaea* forest (S Zambia), termitaria thickets (Zimbabwe, Zambia), thickets at bases of granite hills (Zimbabwe), well-wooded gardens and reedbeds adjacent to evergreen forest, although mainly in drier thick bush in S Mozambique; in Malawi usually in drier sectors (e.g. ridges) of evergreen forest, avoiding moist luxuriant valley bottoms. Sea-level to 1300 m; in E Africa usually below 1000 m, exceptionally to 1800 m. Dispersing young may occupy dense bushes and secondary scrub-forest not used by adults.
Food and Feeding. Mainly insects; no record of fruit consumption. Of 16 stomachs and five faecal samples from Malawi and South Africa, 76% held beetles (Buprestidae, Carabidae, Curculionidae, Elateridae, Melolonthidae, Scarabaeidae, Staphylinidae, Tenebrionidae), 71% ants, 48% termites, 29% crickets, grasshoppers and mantids, 24% spiders, 19% moths and caterpillars (Sphingidae), 14% wasps, 10% plant bugs and flies, 5% millipedes. Nestlings fed with orthopterans and other insects and their larvae, spiders and, commonly, small caterpillars. Spends much time in foraging quietly on ground, flipping leaf litter with bill, digging earth, and breaking open termitaria on twig debris; also makes aerial sallies for flying insects. Often at driver-ant swarms, and most active in twilight.
Breeding. Dec–Feb in E Africa, Nov–Feb on Zanzibar, Nov–Jan in Malawi, Oct–Nov in Zambia and Sept–Dec in Zimbabwe; in South Africa, Oct–Dec in N and Sept–Nov in KwaZulu-Natal. Nest in confined space may be merely a pad of rootlets, otherwise a deep open cup of rootlets and dead leaves, sometimes also dry grass, lichen (notably *Usnea*), bark fibre, twigs, grass heads and/or moss, lined with rootlets, leaf skeletons, animal hair and/or tendrils, placed on average 1·47 m up (0·5–2·3 m in another study) in tree fork, stump top, crevice between bark and trunk, rot-hole, or hole in trunk (often *Gardenia*), commonly next to path or clearing, or in area with open understorey. Eggs 2–3 (usually 3 in KwaZulu-Natal and Zimbabwe), pale green, pale blue or off-white, blotched and freckled with pale and dark brown, mauve and grey; incubation period recorded as 11 days and 13·5–14 days (in latter case female apparently an inattentive sitter); nestling period 15–17 days. In KwaZulu-Natal, only 17% of eggs laid in 15 nests produced fledged young, and five out of 22 nests parasitized by Red-chested Cuckoo (*Cuculus solitarius*); in another S African study parasitism of 12·5% of 24 nests reported (some may have been the same ones); predation by vervet monkeys (*Cercopithecus aethiops*) common at one site in Zimbabwe, two of ten nests successful.
Movements. Sedentary, so far as known.
Status and Conservation. Not globally threatened. Fairly common throughout range. Recently extended range to Matobo National Park, in Zimbabwe. Common in coastal E Africa, but threatened by forest clearance in S Somalia. Some fluctuation of range in KwaZulu-Natal, South Africa, where moving into areas sprayed for tsetse flies in 1940s.
Bibliography. Ash & Miskell (1998), Baker (1983), Baker & Baker (1992), Benson *et al.* (1971), Britton (1980), Clancey (1962c, 1996), Day (1987), Edwards (1998), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Koen (1988), Kuiper & Cherry (2002), Macdonald & Birkenstock (1980), Maclean (1993), Oatley (1966, 1970a, 1970b, 1998), Pakenham (1979), Seiler (2003b), Short & Horne (1985), Sinclair (1984), Sinclair & Ryan (2003), Tarboton *et al.* (1987), Wood (1989), Zimmerman *et al.* (1996).

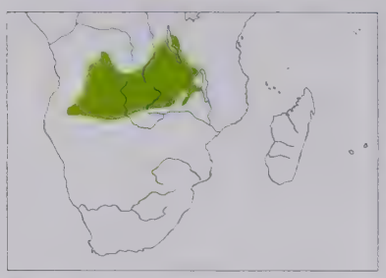
251. Miombo Scrub-robin

Erythropygia barbata

French: Agrobate barbu **German**: Bartheckensänger **Spanish**: Alzacola Barbudo
Other common names: Central/Western/Miombo Bearded Scrub-robin

Taxonomy. *Cossypha barbata* Hartlaub and Finsch, 1870, Caconda, Benguella, Angola.
Genus often merged into *Cercotrichas*. Has been thought to form a superspecies with *E. leucosticta*, *E. quadrivirgata* and *E. signata*, and these four recently separated by some authors in genus *Tychaedon*. Formerly treated as conspecific with *E. quadrivirgata* on basis of convergence of characters (apparently including vocal) in S Zambia and W Tanzania, and still not fully clear that separate species status appropriate; reported overlap in these areas requires documentation, although no evidence of hybridization and the two have distinct habitat preferences. Monotypic.
Distribution. Angola E to W Tanzania.
Descriptive notes. 17 cm. Resembles *E. quadrivirgata*, but paler and much greyer above, with less white in wings but more in tail (outermost rectrices three-quarters white), more extensive orange-cinnamon below, and rufous-washed ear-coverts; bill black, basally often paler; legs pale brown. Populations on E & SE edges of range virtually identical in plumage and voice with *E. quadrivirgata*, and best told by habitat preference. Sexes similar, male larger. Juvenile is like adult but scaled black above, mainly buffish below. Voice. Song loud and melodious, closely resembling that of *E. quadrivirgata* but without the long pauses between series, also simpler, less varied and with notes not slurred (but in Malawi distinction not apparent). Alarm call identical to that of *E. quadrivirgata*.
Habitat. A specialist of miombo (*Brachystegia/Julbernardia*) woodland, favouring areas with denser canopy and thus shorter grass or *Afromomum* bracken understorey, and in particular areas of thicket along watercourses or on termitaria; in NW Zambia also in *Cryptosepalum* forest, *Marquesia* thickets

On following pages: 252. Brown Scrub-robin (*Erythropygia signata*); 253. Brown-backed Scrub-robin (*Erythropygia hartlaubi*); 254. Red-backed Scrub-robin (*Erythropygia leucophrys*); 255. Rufous Scrub-robin (*Erythropygia galactotes*); 256. Kalahari Scrub-robin (*Erythropygia paena*); 257. Karoo Scrub-robin (*Erythropygia coryphaeus*); 258. Black Scrub-robin (*Cercotrichas podobe*); 259. Seychelles Magpie-robin (*Copsychus sechellarum*); 260. Madagascar Magpie-robin (*Copsychus albospecularis*).



and *Uapaca robynsii* woodland. Frequents secondary thickets adjacent to cultivation, and tolerates stock-grazed woodland. Generally between 1300 m and 1700 m, but down to 500 m at edge of L Malawi; 1000–1500 m in Tanzania, to 2300 m in Angola, and 1950 m in DRCongo.

Food and Feeding. Mainly insects, such as ants, beetles (Carabidae, Curculionidae), small grasshoppers, plant bugs and termites (*Microcerotermes* and *Odontotermes*); also spiders (Oxyopidae, Salticidae). Forages on ground in thickets, low scrub and short grass, especially near termite mounds.

Breeding. Sept–Nov in Angola, Aug–Nov in DRCongo and Zambia and Oct–Dec in Malawi. Nest an open cup of fine grass, rootlets and leaf stems, placed in hole in trunk, generally c. 1 m off ground, once at ground level in bottom of stump. Eggs 2–3, pale greenish-white with brown, russet and lilac blotches and spots. Parasitized by Red-chested Cuckoo (*Cuculus solitarius*). No further information.

Movements. Sedentary, so far as known.

Status and Conservation. Not globally threatened. Frequent to common throughout extensive habitat.

Bibliography. Aspinwall & Beel (1998), Benson & Irwin (1966), Benson *et al.* (1971), Chapin (1953), Dean (2000), Dowsett & Prigogine (1974), Keith *et al.* (1992), Lippens & Wille (1976), Oatley (1998), Sinclair & Ryan (2003), Stevenson & Fanshawe (2002).

252. Brown Scrub-robin

Erythropygia signata

French: Agrobate brun **German**: Natalheckensänger **Spanish**: Alzcola Pardo
Other common names: Brown Robin; Tonga Scrub-robin (*tongensis*)

Taxonomy. *Cossypha signata* Sundevall, 1850, Umhlanga, Natal, South Africa.

Genus often merged into *Cercotrichas*. Has been thought to form a superspecies with *E. leucosticta*, *E. quadrivirgata* and *E. barbata*, and these four recently separated by some authors in genus *Tychaedon*. Race *tongensis* fairly distinctive in size, plumage and voice; possibly represents a separate species; one record of apparent hybrization between this race and *E. quadrivirgata*. Proposed race *oatleyi* (known only from type locality, in NE Northern Province) synonymized with nominate. Two subspecies recognized.

Subspecies and Distribution.

E. s. signata (Sundevall, 1850) – E South Africa (E Northern Province S to Eastern Cape).
E. s. tongensis (Roberts, 1931) – S Mozambique and coastal KwaZulu-Natal.



Descriptive notes. 16–19 cm; 32–42 g. Nominate race is dark olive-brown above, rump paler, blackish wings with white marks from carpal to primary bases, tail dark olive-brown centrally with white-tipped blackish outer feathers; grey breast and flanks, shading off-white to belly and vent; white supercilium, subocular crescent, indistinct submoustachial and chin to throat, with dark olive-brown cheek, rather diffuse greyish malar; bill black, legs greyish-pink. Sexes similar, male larger. Juvenile is like adult, but scaled dusky above and below. Race *tongensis* is smaller, paler and shorter-billed than nominate, with stronger malar. Voice. Song a high, deliberate, varied series of short phrases involving sweet melodious pure whistles ending in high chirps and buzzes; confusable with that of *Zoothera gurneyi* but starting on higher note and delivered faster; race *tongensis* tends to sing simpler phrases, often introduced with "skizzz" calls. Song by both sexes, mostly male, throughout year but chiefly Sept–Dec (breeding) and Apr–May (after post-breeding moult); when breeding may sing throughout day, but at other times only at dawn and dusk. Call of nominate a very distinctive, squeaky "ziiit-ziiit-ziiit-ziiit-ziiit", loud in alarm, soft when as contact or in flight, *tongensis* a softer, prolonged "skizzzzzzzz"; in anxiety a high, descending "siiiip".

Habitat. Various evergreen forest types: tall mist-belt forest, relatively dry valley bushveld *Euphorbia* forest along river valleys, and coastal forest in Eastern Cape; narrow ravine forest in S KwaZulu-Natal, large mist-belt and high-rainfall forests north of R Tugela, landward evergreen forest–woodland mosaics on coastal dunes in N KwaZulu-Natal and S Mozambique, and ironwood (*Androstachys johnsonii*) forest in S Mozambique interior. Mainly in undergrowth, favouring stands of broadleaf shrubs such as *Isoglossa* and *Plectranthus*; ascending to mid-levels or canopy to sing.

Food and Feeding. Invertebrates and seeds/fruit. Of 21 stomachs and six faecal samples, 63% held ants, 59% beetles, 48% millipedes, 30% orthopterans, 30% moths, 7% bugs, 7% flies, 7% seeds or fruit, 4% wasps and arachnids. Forages entirely on ground, often on damper leaf mould and soil of gulley bottoms, and sometimes associating with a working mole-rat (*Cryptomys*) or porcupine; occasionally patters leaf litter with alternating feet ("foot-trembling").

Breeding. Oct–Dec, with most clutches Nov. Nest a deep open cup of dead leaves, bark fibre, rootlets and/or moss, lined with fine rootlets and fibres and sometimes animal hair, usually placed 1–2·5 m up in hole in trunk. Eggs 2–3 (average of 19 clutches 2·4), white or pale (bluish-)green with brown, mauve and grey blotches and clouds; incubation period once 14·5 days; nestling period 14–16 days.

Movements. Sedentary; mated pair remains in small area of forest throughout year. Possible vagrants recorded from riparian forest in South African bushveld, and once from Cape Peninsula.

Status and Conservation. Not globally threatened. Restricted-range species: present in South African Forests EBA. In South Africa, common in forests of Eastern Cape at least as far S & W as Alexandria; distribution from Northern Province S to inland KwaZulu-Natal discontinuous, present and common in some forests but inexplicably absent from others; appears to have declined in Durban area, and also vulnerable to disturbance from widespread clearing of forest understorey for cultivation of *Cannabis*. Suggested as having declined in S Mozambique as a result of destruction of coastal forest. Status should be monitored.

Bibliography. Barnes (2000), Calder (1963), Clancey (1966), Collar & Stuart (1985), Harrison *et al.* (1997), Keith *et al.* (1992), Oatley (1966, 1970a, 1998), Parker (1999), Sinclair (1984), Sinclair & Ryan (2003), Skead (1995), Stattersfield *et al.* (1998), Tarboton *et al.* (1987), Taylor (1909).

253. Brown-backed Scrub-robin

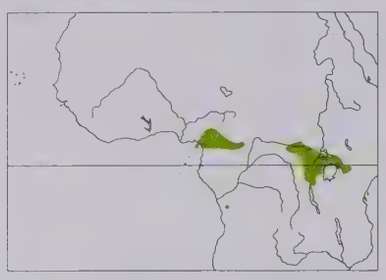
Erythropygia hartlaubi

French: Agrobate à dos brun **German**: Hartlaubheckensänger **Spanish**: Alzcola de Hartlaub
Other common names: Hartlaub's Scrub-robin

Taxonomy. *Erythropygia hartlaubi* Reichenow, 1891, Mutsora, near Ruwenzori, DRCongo.

Genus often merged into *Cercotrichas*. Cameroon birds somewhat smaller. Monotypic.

Distribution. SE Nigeria and S Cameroon E to SW Central African Republic; NE DRCongo E to C Kenya and S to Burundi; and NW Angola.



Descriptive notes. 15 cm; 17–20 g. Relatively small scrub-robin; moves tail constantly. Has crown to upperparts dark brown, greyer on mantle and scapulars, dark grey-brown wings with double white wingbar, dull rufous rump and basal two-thirds of tail, latter terminally dark brown with white tips; white supercilium, subocular crescent, submoustachial and chin to throat, with dark brown cheek, greyish malar extending to breast, breast mottled greyish-buff, shading to white on belly to vent; bill black, legs greyish-pink. Sexes similar, male larger. Juvenile is like adult, but streaked orange-brown above, scaled dusky below. Voice. Song, commonly from exposed perch (sometimes in flight), often by both pair-members in duet, a loud, variable series of cheerful whistled phrases such as "cher-wiii ter, cher-wiii ter tu" and "keyup chiichii wiiiiuu chuprep wiiiiuu chuprep", often persistently repeated, and often with succession of trilled syllables interpolated; female in duet uses simpler phrases, e.g. "sii-lit-sii, chiii-why, lit-sii, sii-sii". Considered sweeter but less diverse than song of *E. leucophrys*. Calls include "piri" or "pri-prit" in anxiety during brood- feeding.

Habitat. High-grass savanna, tall shrubbery, bush-clad slopes, outer fringes of forest ecotones, riparian growth, secondary growth in old clearings, patchworks of old fields, millet fields, banana plantations; strong preference for elephant grass (*Pennisetum*), even small patches, and therefore often near villages. Near sea-level in Cameroon, to 700 m in Angola, 900–2200 m in E Africa, and to 2200 m in DRCongo.

Food and Feeding. Invertebrates, mainly insects, including beetles and their larvae, moths, flies, grasshoppers and lanternflies (Fulgoridae); also small millipedes. Forages on ground or low in shrubs and grasses.

Breeding. Breeding-condition bird Nov in Angola; Mar–May, possibly Jul, in DRCongo, and Apr and Oct in Rwanda; in E Africa in long rains (when may be double-brooded), perhaps also single brood in short rains, thus Feb, Apr–May, Aug and Nov. Nest a deep open cup, often with thickened rim at access point forming incipient ramp; made of dry dead grass, rootlets and dead leaves, lined with fine grass fibre, well concealed in grass tussock at base of woody plant, sometimes virtually on ground, commonly close to footpath. Eggs 2–3, rarely 4, pinkish, creamy or greyish-yellow, with brown freckles and spots; incubation period 12 days; nestling period 14–15 days. Breeding success in E Africa c. 40%.

Movements. Sedentary, so far as known.

Status and Conservation. Not globally threatened. Relatively uncommon and local, despite apparently broad spectrum of habitats.

Bibliography. Bannerman (1953), Borrow & Demey (2001), Britton (1980), Carroll (1988), Chapin (1953), Dean (2000), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lippens & Wille (1976), Manu & Demey (1997), Oatley (1998), Sinclair & Ryan (2003), van Someren (1956), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

254. Red-backed Scrub-robin

Erythropygia leucophrys

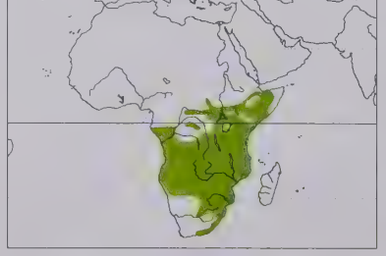
French: Agrobate à dos roux **German**: Weißbrauen-Heckensänger **Spanish**: Alzcola Dorsirrojo
Other common names: White-browed Scrub-robin; White-winged Scrub-robin ("white-winged group")

Taxonomy. *Sylvia leucophrys* Vieillot, 1817, Gamtoos River, eastern Cape Province, South Africa.

Genus often merged into *Cercotrichas*. Races form two geographically interdigitating groups, NE "white-winged group" and "red-backed group", these possibly differing also in voice and habitat; detailed evaluation required in order to determine whether two species involved. Geographical variation partly clinal; races *ovamboensis*, *munda* and *zambesiana* perhaps invalid. Described race *simulator* (from S Mozambique) synonymized with nominate. Nine subspecies recognized.

Subspecies and Distribution.

E. l. leucoptera (Rüppell, 1845) – SE Sudan, S Ethiopia, N Somalia and N Kenya.
E. l. eluta Bowen, 1934 – S Somalia and NE Kenya.
E. l. brunneiceps Reichenow, 1891 – C & S Kenya and N Tanzania.
E. l. vulpina Reichenow, 1891 – E Kenya and E Tanzania.
E. l. sclateri Grote, 1930 – C Tanzania.
E. l. zambesiana Sharpe, 1882 – S Sudan, N & E DRCongo, Uganda and W Kenya S to E & S Zambia, E Zimbabwe and N Mozambique.
E. l. munda (Cabanis, 1880) – S Gabon E to W DRCongo and S to C Angola.
E. l. ovamboensis Neumann, 1920 – S Angola and N Namibia E to SW Zambia and W Zimbabwe.
E. l. leucophrys (Vieillot, 1817) – S Zimbabwe and S Mozambique S to N & E South Africa.



Descriptive notes. 14–16 cm; 13–20 g. Nominate race is olive-brown above, shading to rufous on rump, with blackish wings with double white wingbar and buffy margins of flight-feathers; blackish tail, outer feathers with white spots on tips and white outer edges; white supercilium, subocular crescent, submoustachial and chin to throat, with olive-brown cheek, dark brown lores and eyestripe, and dark malar linking to dark-streaked olive-buff breast and flanks; whitish rest of underparts; bill blackish, legs pinkish-grey. Sexes similar. Juvenile is like adult, but scaled dark above and below. Race *leucoptera* is slightly paler, with greyer head, rufous-brown from scapulars to lower back, intensifying to rufous on rump and three-

quarters of tail, mostly white edgings of wing-coverts and flight-feathers (large panel), only faintly marked below, more heavily buff-tinged flanks; *eluta* is paler above than previous; *vulpina* has less grey crown, more intense rufous on scapulars, less brown and white on tail tips; *brunneiceps* is larger than preceding races, darker on crown, less white in wing (usually showing two clear wingbars), breast buffy-white; *sclateri* is like previous but smaller, brighter above, less streaked below; *zambesiana* is very like nominate, but with tail mostly rufous; *munda* resembles previous but duller above, tail less rufous; *ovamboensis* is like last, but greyer above, little rufous in tail. Voice. Song, often from open perch but also well inside cover, very loud series of often rapid whistled phrases, somewhat repetitive, but geographically rather variable; white-winged populations perform song bouts in which same single phrase repeated, typically as "wuriit sii-titi-yew"; typical phrase of S populations "williedii-bedii-bedii-bediio"; mimicry slight or absent. "Soliloquy song" quiet, from deep in cover, usually during moult but also at other times of year, possibly involves first-year individuals. "Song call", a whistled "piip-bu go", heard commonly at sunset as roosting note. Alarm a staccato ratcheting, "skirr" or "skee-ip", sometimes extended; in anxiety a plaintive "chiiyip" (not reported in S populations).

Habitat. Wide variety of bushy and wooded country. Open arid thorn-scrub and woodland, notably where dominated by *Acacia* or *Commiphora* and where clumps and thickets of *Aloe* plants occur; also in dune scrub and edges of dune forest. Usually abundant in sweet-grass areas supporting high numbers of grazing mammals. Also in various broadleaf woodlands dominated by e.g. *Terminalia*, *Colophospermum* (mopane) and *Baikiaea*; less common in miombo (*Brachystegia*) woodland, where usually restricted to secondary growth. In equatorial rainforest region occurs in regenerating clearings around towns. Sea-level to 1400 m, but to 2200 m in E Africa and at least 1720 in DRCongo. Where sympatric with *E. hartlaubi*, generally in drier habitats at lower altitudes.

Food and Feeding. Invertebrates, mainly insects, in particular termites. Of 23 stomachs and faecal samples from S Africa, 69% held termites, 67% ants, 59% beetles (Carabidae, Chrysomelidae, Curculionidae, Scarabaeidae), 31% moths and caterpillars, 27% plant bugs, 18% crickets and grasshoppers, 12% spiders (Salticidae), 10% fruit, 4% parasitic wasps, 4% millipedes, 2% flies and 2% ant-lions. Young fed with caterpillars, small moths and millipedes, Lampyrinae larvae, spiders, damselflies, small grasshoppers, and fly and beetle larvae. Consumes small drupes of *Vitex*; in winter may probe aloes for nectar. Forages mainly on ground, flipping leaf litter with bill; breaks open termite galleries on leaf debris, and searches droppings of large herbivores for fly larvae and dung beetles; occasionally sallies after alate termites.

Breeding. Mar–May in Ethiopia; Oct–Jan in Rwanda; at any time of year in DRCongo and E Africa, but mainly Apr–May in latter; Oct–Nov in Angola; Oct–Feb in Mozambique, Malawi and Zambia; Sept–Feb (peak Oct-Dec) in S Africa. Territory size based on spacing of singing males 0·75–1 ha. Nest an open cup, usually untidy, sometimes neat, made of dead grass, bark flakes, slender twigs and/or dead leaves, lined with grass rootlets, grass heads and/or leaf skeletons, commonly placed 0·2 m up in grass tussock often near tree base, also in dead grass overlying fallen branches and, in heavily grazed areas, patch of grass in shelter of spiny plants; dead skirts of large aloes (e.g. *Aloe marlothii*) frequently used; high rate of nest predation results in 2–3 nests built per season in small area. Eggs 2–3 (once 4, mainly 3, average in South Africa 2·7), white, cream or buff with brown and mauve spots and blotches; incubation period 12 days; nestling period 11–12 days; post-fledging dependence probably at least 2 weeks. Occasional brood parasitism by Red-chested Cuckoo (*Cuculus solitarius*) (1·16% of 259 nests), Black Cuckoo (*Cuculus clamosus*) and Diederik and Klaas's Cuckoos (*Chrysococcyx caprius* and *C. klaas*) in S Africa. From 93 eggs in 34 clutches, KwaZulu-Natal, 32 fledglings resulted (34% success); nest predation by slender mongoose (*Herpestes sanguineus*) frequent.

Movements. Sedentary almost everywhere; in extreme S of range, regular winter desertion of thornveld occurs in Eastern Cape.

Status and Conservation. Not globally threatened. The common scrub-robin of much of E & C Africa. Frequent to abundant, with very large range and great ecological flexibility (preferring drier habitat than most congeners); overall numbers high, and unlikely to be greatly affected by habitat changes. Locally common in coastal and SE Gabon and in PRCongo; rare in Sudan. Density in N South Africa reaches 8 pairs/km² in broadleaf woodland, but only 0·45 pairs/km² in acacia woodland; in PRCongo, 20–25 pairs/km² in wooded grassland; in S Mozambique, densities in acacia, mopane, miombo and other broadleaf woodlands respectively 29, 17, 16 and 24 birds/km².

Bibliography. Bannerman (1953), Benson (1946a), Benson *et al.* (1971), Beresford (2003), Borrow & Demey (2001), Britton (1980), Chapin (1953), Clancey (1975), Day (1987), Dean (2000), Dowsett & Dowsett-Lemaire (1997), Dowsett & Prigogine (1974), Earlé & Grobler (1987), Hall (1960a), Harrison *et al.* (1997), Irwin (1981), Keith *et al.* (1992), Koen (1988), Kuiper & Cherry (2002), Lippens & Wille (1976), Maclean (1993), Monroe (1964), Nikolaus (1987), Oatley (1998), Parker (1999), Payne & Payne (1967), Randall (1987), Rowan (1983), Sinclair (1984), Sinclair & Ryan (2003), Skinner (1993), van Someren (1956), Swynnerton (1908), Tarboton (2001), Tarboton *et al.* (1987), Traylor (1962), Vincent (1935b), Zimmerman *et al.* (1996).

255. Rufous Scrub-robin

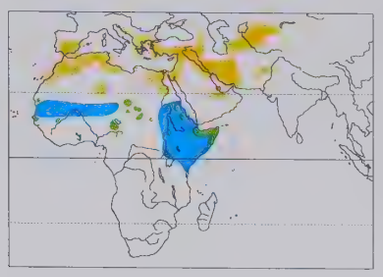
Erythropygia galactotes

French: Agrobate roux **German**: Heckensänger **Spanish**: Alzacola Rojizo
Other common names: Rufous(-tailed) Bush-robin/Scrub-robin/Bush-chat/Scrub-warbler; Greyish Scrub-robin, Grey-backed Warbler (*familiaris*); African Scrub-robin (*minor/hamertoni*)

Taxonomy. *Sylvia galactotes* Temminck, 1820, Algeciras, southern Spain.
Genus often merged into *Cercotrichas*. Paler and greyer birds from Transcaspia described as race *deserticola*; subsumed in *familiaris*, but possibly merits recognition. Five subspecies recognized.

Subspecies and Distribution.
E. g. galactotes (Temminck, 1820) – S & E Iberia (possibly also S France), N Africa (S to S Algeria), Israel and SW Syria; non-breeding Sahel zone of W Africa.
E. g. syriaca (Hemprich & Ehrenberg, 1833) – Balkans E to W & S Turkey, W Syria and Lebanon; non-breeding NE & E Africa.
E. g. familiaris (Ménétriés, 1832) – Transcaucasia, SE Turkey, Iraq and NE & E Arabia E to S Kazakhstan, E Iran, E Afghanistan and W Pakistan; non-breeding NE Africa.
E. g. minor (Cabanis, 1850) – Senegal and Gambia E to N Somalia.
E. g. hamertoni Ogilvie-Grant, 1906 – E Somalia.

Descriptive notes. 15 cm; 20–28 g. Nominate race is sandy-rufous from crown backwards, intensifying to foxy-rufous on tail, latter tipped black and white (prominent during frequent tail movement), with dusky wings; creamy-white supercilium bordering blackish eyestripe, creamy-white face and throat with short thin dark submoustachial, sandy-buff breast and flanks, whitish belly to vent; bill brownish at tip, paler basally; legs pinkish-brown. Sexes similar, male larger. Juvenile is like adult but paler, with smaller black and white marks in tail. Race *syriaca* is grey-brown from crown to back and wings; *familiaris* resembles previous, but paler and greyer above, whiter below; *minor* is like nominate but smaller, more pink-brown above, with reduced black in tail; *hamertoni* is small, darker above than nominate. Voice. Song, by male only, a sustained sweet but repetitive unmusical warbling, a variable fluty twittering, with thrush-like or tremulous quality, with or without short



pauses between phrases, "dah-de-dah-deehh, di-dah-dih esso-bibibit tobebít dih dededó" and so on. Calls include hard "tek tek" or "chak chak", sibilant "tssiiiiit" and "zip" or "si-sip" for contact, "zi-zi-zi" in alarm, and fluty "piu" as warning.

Habitat. In Europe mainly artifical habitats such as olive and almond groves, vineyards, citrus and young pine plantations, parks, orchards. In Morocco commonest in bushy vegetation (*Tamarix*, *Nerium*, *Vitex*) along rivers, regular in open dry woodland (*Tetraclinis*, *Argania*, *Juniperus*, *Quercus*), on scrub-covered slopes with *Olea* and *Pistacia* or thorn bushes (*Rhus*, *Acacia*) and in gardens and orchards, especially where bounded by *Opuntia* cactus hedges, but in S more restricted to irrigated oases, palmeries and dry riverbed vegetation (*Launaea*, *Ziziphus*, *Nitraria*, *Limoniastrum*); mostly lowlands but reaching 1000 m, occasionally 1500 m. In Tunisia commonest in cactus growth, orchards and oases. In Israel commonest in well-vegetated, naturally bushy areas with low scattered trees; palm groves and shrubs bordering fields or water-filled wadis in Arabian Peninsula. In sub-Saharan Africa favours dry bushy country with sparse herb layer and short-grass areas with taller cover, thick, dry, almost closed-canopy woodland with heavy grass layer, semi-desert with *Alhagi*, *Artemisia*, *Berberis*, *Acacia*, etc., wooded pasture, farmland, orchards, vineyards, fruit plantations, *Opuntia* thickets, aloe patches, tamarisk stands, semi-shaded gardens, palm groves, oases, open sand dunes with well-spaced shrubs and sparse tree cover. In C Asia occupies valleys with patches of shrubs and bulrush, penetrating scrubby dunes, bushes in saline and alkaline steppe, and lower reaches of juniper zones on hills. In Pakistan breeds in scattered clumps of *Saccharum* cane grass, *Tamarix* and thorny bushes. On migration and in winter similar habitats, including dry scrub-jungle, tamarisks, acacia steppe, often around human settlements.

Food and Feeding. Invertebrates, mainly insects, including beetles, bugs, ants, bees, wasps, flies (including robberflies), dragonflies, grasshoppers, caterpillars, moths, small butterflies, mantises, earwigs, cicadas, ant-lion larvae; also spiders, centipedes, millipedes and earthworms; also fruit, berries and seeds. In Morocco three birds consumed large caterpillars (five), beetles (two), other insects and *Nitraria* fruits (six). In Iraq recorded as taking hymenopterans (especially ants), grasshoppers up to 5 cm long, mantises and small lepidopterans. In SC Russia 49 stomachs held mainly beetles, fly adults and larvae and larval hawkmoths; in Uzbekistan 17 held mainly ants and curculionid beetles. Smooth greenish caterpillars and small lycaenid butterflies seen brought to newly hatched nestlings, later also spiders, caterpillars, ants, beetles, earthworms, bugs, fly larvae, grasshoppers, cicadas and berries. Forages mainly on ground, hopping strongly under vegetation or over half-open grassy substrates, and probing soil, flipping over leaves, and pecking among stones and herbage; also makes fluttering sallies off ground to snatch insects from herb clumps and flowerheads.

Breeding. Mid-May to Jun in S Europe and Kazakhstan and May–Aug in Armenia; Apr–Aug in Israel; mainly May–Jun in Pakistan; Apr–Aug, mainly May–Jun, in Africa; two-thirds of pairs double-brooded in SE Spain, perhaps double-brooded in N Africa. Territory size in Spain 1–8 ha, in Israel 0·4–1 ha. Nest a loose flat cup of dry grass stems, rootlets, twigs, bark and leaves, often shed snakeskin incorporated, lined with fine fibres, hair and feathers, placed 0·5–5 m (usually 1–2 m) up in dense vegetation, often spiny, in reed clump, small tree (commonly *Olea europaea* or *Pinus halepensis* in SE Spain), shrub or grapevine, or crevice in building; on rubbish tips preference for human artefact (oil drum, breeze blocks, tin can) over available bushes; once in engine of tractor. Eggs 3–6 (mean in SE Spain 3·6), pale greenish-blue to whitish with brownish, purplish and greyish speckling; incubation period 13–14 days; nestling period 10–13 days; in Israel young disappear from breeding grounds as soon as independent (mid-Jun to end Aug). In one area of SW Spain, nest parasitism by Common Cuckoos (*Cuculus canorus*) 27% in each of two years; in another area incidence 19%. Of 36 eggs in nine clutches in Uzbekistan, 24 hatched, from which 16 young fledged, giving overall success 44%. Birds with larger tail-end markings have elevated breeding success and lower rates of nest predation; females in poor condition produce fewer fledglings per year than do females in prime condition, and old individuals produce more and heavier fledglings per year than do yearlings; poor breeding success or partner condition much less correlated with divorce than are rates of nest predation (latter probably linked to male contribution in nest defence). Adult survival rate in S Spain 0·57. Oldest recorded bird at least 6 years.

Movements. African races *minor* and *hamertoni* sedentary. Others migratory, wintering in Africa. Autumn passage of nominate race Sept to early Oct (but in Morocco breeding birds leave Aug to early Sept, migrants from farther N passing mainly in Sept), crossing Sahara to winter in Sahel belt, but apparently absent in Chad and W Sudan; return to N Africa and beyond between early Apr and early May. In Israel main passage periods Aug to mid-Sept and mid-Apr to end May; in UAE Sept to early Oct and late Mar to early May (common), Bahrain mainly Sept. Race *familiaris* leaves Kazakhstan second half Aug, some passing through NW India (none in spring), main passage Arabia mid-Aug to mid-Oct, and *syriaca* departs Turkey Aug–Sept, moving through Cyprus Aug to early Oct; both winter in NE & E Africa Sept–May, equally common in Somalia, *syriaca* commoner than *familiaris* in Ethiopia, *familiaris* common (and *syriaca* rare or absent) in Kenya, where main arrival Nov and departure Mar–Apr; spring passage in Somalia mid-Mar to mid-May. Bahrain mostly Apr. First arrivals Kazakhstan end Apr to early May, main passage through May. Vagrants recorded in NW & C Europe; one spring record of *familiaris* in W China.

Status and Conservation. Not globally threatened. Estimated European population 16,333–31,599 pairs in mid-1990s, great majority in Spain, and with additional Turkish in range 5000–50,000 pairs; by 2000 total European population (including Turkey) revised to 32,000–96,000 pairs, judged to be in decline. Density measures in parts of E Spain suggest steady decline (e.g. 0·36 pairs/10 ha in 1980 but 0·7 pairs/10 ha in 1984 in one area in SE), also range contraction, perhaps attributable to Sahelian droughts; situation apparently stable in W, but species still rated as endangered in Spain. Abundant in parts of Israel, with minor losses owing to expansion of settlements and use of certain crops; population in 1980s put at 20,000–40,000 pairs and density in one area 30 pairs/km². Locally common breeder in Bahrain, and estimated 50–100 pairs in UAE. Population modest in Armenia, and semi-desert habitats there under threat of agricultural and urban development, but generally common in plains of C Asia; sparse in W Pakistan. In peri-Saharan range in Africa, locally common to common except in Tunisia, where scarce but widespread. In winter, widespread and common E Africa, but more local in N Kenya.

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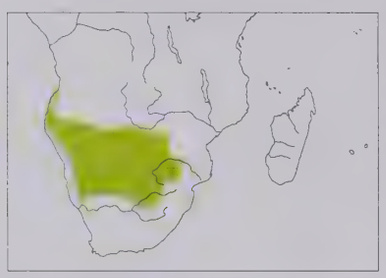
(1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Jennings (1981a), Jordan (2000), Kasparek (1992), Keith *et al.* (1992), Ledant *et al.* (1981), Lewis & Pomeroy (1989), López (1989, 2003), López & Gil-Delgado (1988), Morel & Morel (1990), Nightingale & Hill (1993), Nikolaus (1987), Palomino & Martín-Vivaldi (1994), Palomino, Martín-Vivaldi & Soler (1998, 1999), Palomino, Martín-Vivaldi, Soler & Soler (1998), Paludan (1959), Paz (1987), Porter *et al.* (1996), Rasmussen & Anderton (2005), Richardson (1990), Roberts (1992), Roselaar (1995), Sage (1960), Sharland & Wilkinson (1981), Shirihai (1996), Silsby (1980), Sinclair & Ryan (2003), Smith (1955), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Valverde (1957), Vaurie (1955b), Walker (1981), Welch & Welch (1984), Whitaker (1905), Wilkinson (1979), Zimmerman *et al.* (1996).

256. **Kalahari Scrub-robin**

Erythropygia paena

French: Agrobate du Kalahari **Spanish**: Alzacola del Kalahari
German: Kalahariheckensänger
Other common names: Sandy Scrub-robin

Taxonomy. *Erythropygia paena* A. Smith, 1836, between Latakoo and the Tropic = north of Kuruman, northern Cape Province, South Africa.
Genus often merged into *Cercotrichas*. Geographical variation clinal, palest in NW and darkest in E. Four subspecies recognized.
Subspecies and Distribution.
E. p. benguellensis Hartert, 1907 – SW Angola.
E. p. damarensis Hartert, 1907 – Namibia.
E. p. paena (A. Smith, 1836) – Botswana and NC South Africa (Northern Cape).
E. p. oriens Clancey, 1957 – S Zimbabwe and N South Africa (Northern Province, Free State).



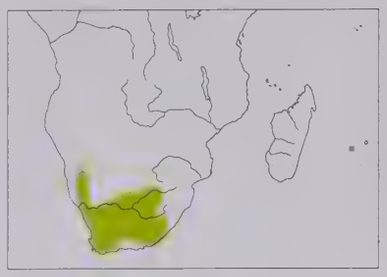
Descriptive notes. 16 cm; 17–23 g. Like *E. galactotes*, but with greyer crown and nape, buff-edged blacker wings, more extensive black in tail, creamier-white chin and throat, greyish-buff breast to undertail-coverts, blacker and thinner bill, blackish legs. Sexes similar. Juvenile scaled dusky above and below. Race *benguellensis* has head pale grey, upperparts brownish-grey, tail pale rufous, underparts whitish; *damarensis* like previous but darker grey above; *oriens* darker above and browner below than nominate. Voice. Song a prolonged series of phrases consisting of pleasing whistles and warbling chirps with many repeated motifs, e.g. "wiiyu, wiiyu, chiiip, wiirip, wiirip, willerip, willerip, chiiyu, chiichiiyu"; more varied and musical than those of partly sympatric *E. leucophrys* and *E. coryphaeus*; some individuals have large repertoire of mimicry. Calls include sparrow-like "siiiup" for contact and in anxiety, and a rasping "ziii" in alarm.
Habitat. Open sandveld with scattered low trees and bushes, including *Colophospermum*, *Combretum* and *Terminalia*, at edges of range also glades and edges in *Baikiaea* woodland; also old fields, and grazed and browsed areas with low secondary scrub. Fringes of *Acacia mellifera* bushes around temporary pans favoured in Botswana. In SE of range scrub and wooded savanna of N bushveld areas occupied. Key features include an area of bare or almost bare ground for foraging, and at least one tree or substantial bush, or else telegraph pole or wires, to serve as songpost. Regularly found near cattle dips, and uses lawns of homestead gardens. Sea-level to middle elevations; to 1200 m in Angola.
Food and Feeding. Mainly insects; regularly takes harvester termite workers (Hodotermitidae), which other robins tend to shun. Of eight stomachs from Botswana and N South Africa, all held termites (Hodotermitidae, Termitidae), five held beetles (Coccinellidae, Curculionidae, Tenebrionidae) and ants (Myrmicinae, Ponerinae), four contained bugs (Pentatomidae), moths and caterpillars, and berry seeds, three held grasshoppers and mantises, one contained spiders. Stomachs of 19 birds from throughout year in Free State held, by number, 29% seeds, 21% ants, 17% termites, 16% berries, 10% beetles, 4% unidentified larvae, 2% bugs, and 1% lepidopterans and orthopterans. Forages mainly on bare ground, usually in partial cover, but in old fields in open.
Breeding. Breeding-condition birds Jun–Jul in Angola; Oct–Mar in Namibia, Jul and Sept–Dec in Botswana and Sept–Dec in Zimbabwe; in South Africa, Jul–Jan (peak Oct–Dec) in N, Aug–Dec in Free State, Feb, Apr, Jul, Sept and Nov–Dec in Northern Cape; in driest parts of range may breed opportunistically in response to rainfall; sometimes two or three broods. Nest an open, often untidy cup of dried leaves and fine twigs, neatly lined with fine rootlets, tendrils and sometimes animal hair, usually placed low (average 0·33 m, highest 1·5 m up) or on ground in thorny shrub or bush. Eggs 2–3, usually 2, rarely 4, glossy white (rarely pale green) with yellowish-brown and reddish-brown spots and freckles and greyish-purple and lilac blotches; incubation period 13 days; nestling period (one nest) 14 days. Single record of brood parasitism by Diederik Cuckoo (*Chrysococcyx caprius*).
Movements. Largely sedentary; local seasonal movements may occur in Zimbabwe and perhaps elsewhere, deserting ungrazed areas where good rains promote tall grass growth.
Status and Conservation. Not globally threatened. Common.
Bibliography. Brown (1993), Day (1987), Dean (2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Herremans & Herremans (1992), Irwin (1981), Keith *et al.* (1992), Kopij (2003), Maclean (1993), Milstein (1974), Oatley (1970a, 1998), Penry (1994), Sinclair (1984), Sinclair & Ryan (2003), Skead (1971), Tarboton *et al.* (1987), Traylor (1962, 1965).

257. **Karoo Scrub-robin**

Erythropygia coryphaeus

French: Agrobate coryphée **German**: Karroheckensänger **Spanish**: Alzacola del Karroo
Other common names: Cape Scrub-robin

Taxonomy. *Sylvia coryphæus* Vieillot, 1817, eastern Cape Province, South Africa.
Genus often merged into *Cercotrichas*. Differs from congeners (and *Cercotrichas*) in basic egg colour (blue, as opposed to white) and song, and nestling hatches with down feathers (rather than naked), perhaps suggesting that placement in its own monotypic genus may be appropriate. Recently claimed that original, and thus correct, spelling of species name is *coryphoeus*, but in old publications the two diphthongs are notoriously difficult to distinguish, as in this case; with such uncertainty, it seems best to stick with established usuage. Two subspecies recognized.
Subspecies and Distribution.
E. c. coryphaeus (Vieillot, 1817) – S Namibia, W & C South Africa (E to W Free State and Eastern Cape) and W Lesotho.
E. c. cinerea Macdonald, 1952 – SW Western Cape.



Descriptive notes. 15-17 cm; 19–22 g. Nominate race is dull grey-brown above and below, with white supercilium, narrow white suboocular crescent, whitish chin and throat, greyish malar to breast and neck side, blackish wings, black tail with white tips of outer feathers; dull brownish-buff breast tinged greyish-olive; bill and legs black. Sexes similar. Juvenile is barred dusky above and below. Race *cinerea* is slightly paler and greyer above and below. Voice. Song (confined to breeding season) a series of unmusical husky irregular stutters, chirrups and chirps, mixing whistles and guttural notes, sometimes involving weak mimicry and generally reminiscent of an *Acrocephalus* reed warbler. Calls include "skizzlezit" or "zittery" for contact and challenge, also grating "chukkaruk, chukkaruk"; sizzling chatter when mobbing; abrupt "tshiek" in alarm; regular harsh "swaynk, swaynk, swaynk" when nest disturbed; and rapid stuttering "tsik, tsik, tsik" when with fledged young.
Habitat. Scrub, with interspersed bare ground for foraging: Karoo scrub, drier fynbos such as renosterveld, strandveld dune scrub, mixed deciduous and evergreen hillside bush, thorn thickets 3–5 m tall, scrub along gulleys, farmstead gardens. In more arid habitats prefers areas where lusher vegetation at least 1 m high, including stands of tamarisk (*Tamarix usneoides*). Avoids herbaceous cover, areas of deep sand, and mountainsides.
Food and Feeding. Insects and fruit: ants, beetles (Chrysomelidae, Curculionidae, Elateridae, Scarabaeidae, Tenebrionidae), flies (Muscidae, Sepsidae), small grasshoppers and small parasitic wasps; also seeds and fruits of *Lycium*. Stomachs of 21 birds from throughout year in Free State (South Africa) held, by number, 55% ants, 22% seeds, 14% beetles, 4% berries, 4% termites and 1% bugs. Forages on ground; opportunistically hawks passing insects in flight. In coastal strandveld scrub (fynbos), seen to forage on small sandy beaches among washed-up seaweed.
Breeding. Generally Jul–Dec, earliest in W, peak laying in Sept–Oct; Aug–Feb (peak Nov) in Namibia; no evidence of double-brooding. Territory c. 0·5 ha. Commonly has helpers at nest. Nest an open, often deep cup, sometimes neat, sometimes loose, made of coarse dead twigs, bark flakes, dry grass, tendrils and rootlets, lined with dry grass, leaf parts, moss or animal hair, placed on ground (when generally with ramp of thick dry twigs at access point), very occasionally up to 1 m up in shrub, bankside or low tree hole. Eggs 2–4 (average of 24 clutches 2·4), pale greenish-blue with reddish-brown and purplish-grey speckling and spotting; incubation period 13–15 days; nestling period 13–14·5 days; post-fledging dependency at least 3 weeks. Rare records of brood parasitism by Diederik Cuckoo (*Chrysococcyx caprius*). Nest failure common.
Movements. Resident; occasional short-distance vagrancy.
Status and Conservation. Not globally threatened. Common. Ubiquitous in strandveld in coastal Namaqualand and SW Cape.
Bibliography. Clancey (1969a), Farkas (1988), Harrison *et al.* (1997), Hockey *et al.* (1989), Keith *et al.* (1992), Kopij (2003), Longrigg (1983), Maclean (1993), Oatley (1998, 2003a), Payne & Payne (1967), Sinclair (1984), Sinclair & Ryan (2003), Steyn (1983, 1996).

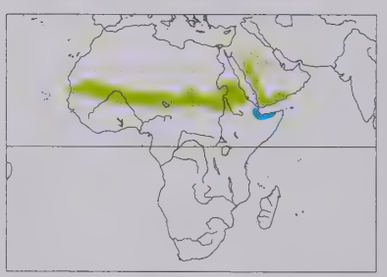
Genus *CERCOTRICHAS* Boie, 1831

258. **Black Scrub-robin**

Cercotrichas podobe

French: Agrobate podobé **German**: Rußheckensänger **Spanish**: Alzacola Negro
Other common names: Black Bush-robin, Black Bush-chat

Taxonomy. *Turdus podobe* Statius Muller, 1776, Senegal.
Differs from *Erythropygia* in generally larger size and distinctively black plumage. Race *melanoptera* apparently intergrades with nominate in W Arabia, where sample of museum skins revealed 25% showing traces of rufous in wing. Two subspecies recognized.
Subspecies and Distribution.
C. p. podobe (Statius Muller, 1776) – S Mauritania and N Senegal E to NE Sudan, N Ethiopia and W Arabia; non-breeding also N Somalia.
C. p. melanoptera (Hemprich & Ehrenberg, 1833) – W, C & S Arabian Peninsula.



Descriptive notes. 18–20 cm; 24–27 g. Long-legged scrub-robin with long, graduated and usually high-cocked tail. Nominate race is greyish-black, with black rump, wings and tail, wings with rufous on upper surface of inner webs of flight-feathers (sometimes visible in flight), tail with broad white tips, undertail-coverts with white chevrons; bill and legs black. Sexes similar, male larger. Juvenile is like adult but much browner, white tail tips smaller, more extensive rufous on inner webs of flight-feathers, rufous-tinged tertials and greater coverts. Race *melanoptera* lacks rufous in wing. Voice. Song, given most of year, a series of far-carrying, variable, short (1–2 seconds) phrases each of which starts with sweet falling note (often with trill in it) and ends with scratchy falling note, "shiiia-titi-siita-sjria"; very like that of *E. galactotes*. Subsong common, a sustained babbling medley of sweet and scratchy, fluty and squeaky notes. Calls include hoarse squeak and liquid chatter.
Habitat. Hot arid subdesert and savanna with scattered shrubs or acacia bushes, groves of date palms and doum palms, tamarisks and *Salvadora* bushes, wadi thickets, and thorn hedges around livestock enclosures. Lowlands, to c. 1500 m; scarce above 1200 m in Yemen.
Food and Feeding. Diet apparently unreported. Forages mainly on ground, probing seemingly bare sand or soil under bushes with some leaf litter; also in low bushes.
Breeding. Feb–Jul in Senegal, to Sept in Mali; Apr–Jun at L Chad, on Nigeria–Chad border; May in Sudan, May and Jul–Aug in Ethiopia; Mar–Jul in Arabian Peninsula. Nest a ragged flat cup of dry grass, palm fibres, twigs and rootlets, lined with hair, wool and fine grass, placed 1–2 m up in

small palm or palm undergrowth, *Ziziphus* bush, centre of pomegranate tree, or crevice in tree trunk or building (shed roof, grain store). Eggs 2–4, pale greenish to greyish-white with olive, grey or reddish-brown speckles. No other information

Movements. Mainly resident. Apparently winter visitor to Somalia, where all records are in Nov–Mar; origin of migrants uncertain. In Arabia records at up to 2400 m may represent migrants, as breeding populations thought confined below 1500 m, but recorded in all months of year C Arabia.

Status and Conservation. Not globally threatened. Fairly common across Sahel, and very common across C Sudan; common in S Yemen. Extending range towards N & E in Arabian Peninsula since c. 1980, apparently in response to increased irrigation and cultivation; 30 seen along 15 km of R Riyadh in Apr 1999. Rare but now regular in Israel in spring, where recently bred in S and thought to be colonizing; also recorded very recently in Jordan.

Bibliography. Archer & Godman (1937–1961), Ash & Miskell (1983), Bannerman (1936, 1953), Barlow *et al.* (1997), Bates (1927, 1934, 1936), Beaman & Madge (1998), Borrow & Demey (2001), Brooks *et al.* (1987), Butler (1905, 1908), Cornwallis & Porter (1982), Cramp (1988), Eames (1986), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Gaston (1970), Heim de Balsac & Mayaud (1951), Hollom *et al.* (1988), Jennings (1995, 2004), Keith *et al.* (1992), Morel & Morel (1990), Newby (1980), Newby *et al.* (1987), Nikolaus (1987), Porter *et al.* (1996), Sclater & Mackworth-Praed (1918), Sharland & Wilkinson (1981), Shirihai (1996), Silsby (1980), Sinclair & Ryan (2003), Smith (1955), Welch & Welch (1984).

Genus *COPSYCHUS* Wagler, 1827

259. **Seychelles Magpie-robin**

Copsychus sechellarum

French: Shama des Seychelles **German**: Seychellendajal **Spanish**: Shama de Seychelles

Taxonomy. *Copsychus sechellarum* A. Newton, 1865, on some islands of the Seychelles.

May form a superspecies with *C. albospecularis* and *C. saularis*. Monotypic.

Distribution. Seychelles, on islands of Frégate and Cousin. Introduced on Cousine and Aride.



Descriptive notes. 18–20 cm; male mean 77 g, female mean 65 g. Fairly large magpie-robin. Plumage is all glossy black (looks glossy blue-black in sunlight), with broad white patch on shoulder to inner greater wing-coverts; erectile feathering on lores, forehead and gular region; bill and legs black. Differs from similar *C. albospecularis* in larger size, longer-tail, rather elongate skull and bill. Sexes similar. Juvenile is less glossy, with chestnut tinge in shoulder. Voice. Song, by male (occasionally by female, when often in duet), usually from tall tree, before dawn and at dusk, a series of jumbled, melodious, fluty phrases; may include mimicry of e.g. Whimbrel (*Numenius phaeopus*), Common Sandpiper (*Actitis hypoleucos*), Common Myna (*Acridotheres tristis*) and Red Fody (*Foudia madagascariensis*). Subsong a series of soft throaty warbles and chucklings, usually from low shaded perch, often in heavy rain. In courtship and aggression a harsh version of subsong. Calls include loud ascending explosive whistling, "whooeet-whooeet-whooeet", in alarm, softer, slower version before roosting; 3-note "wheeoo-whoo", last note lower, in response to intruder; soft slow rising whistle when nest or young approached; descending 4-note scale often ending in trill, by female in low alarm; harsh churr in irritation; explosive nasal "cherr" when attacking potential predators near nests.

Habitat. Mature coastal forest with well-developed canopy, sparse herb layer and deep leaf litter (original habitat), e.g. groves of pisonia (*Pisonia grandis*), sangdragon (*Pterocarpus indicus*) and breadfruit (*Artocarpus altilis*), with other trees scattered singly, mixed with cultivated plots, tracks and open ground around houses; also now plantations and vegetable gardens where moderately similar conditions, and mature woodland in upper C areas of islands. Further important habitat features are coconut trees, for nesting, and fresh water.

Food and Feeding. Small to mid-sized invertebrates, small vertebrates and fruit; also household scraps. Favoured invertebrate prey insect larvae (on Frégate including those of endemic giant tenebrionid beetle *Pulposipes herculeanus*), termites, cockroaches, millipedes, centipedes, grasshoppers, crickets, spiders, scorpions and earthworms; among vertebrates, four species of skink, two species of gecko, frogs, caecilians, baby mice and young snakes, also small fish (dropped by seabirds), seabird eggs and crabs when available. Fruits taken are figs, coconut, mango, cashew and pawpaw. On Cousine, an exotic cockroach (*Pycnoscelus indicus*) and dropped fish important prey items. Forages mainly on ground (93% of foraging time) and mostly under large trees, especially groves of sangdragon and mature fruit trees, including breadfruit, which provide low shaded perches and bare substrate; also in gardens, coming to verandas and onto outdoor dining tables. On Frégate, sometimes follows giant tortoises, humans or livestock in search of disturbed insects.

Breeding. All year if food available, with peak Nov–Mar, correlated with rainfall (48% of breeding attempts in wettest three months). Occasional co-operative breeding involving immature helper. Mean territory size on Frégate 2·9–4·5 ha, varying with habitat quality. Nest a cup of dry grass, small twigs and coconut fibre, unlined, placed in rotted-out hole in large tree or in crown of coconut palm. Egg 1, pale blue; incubation period 16–23 days; nestling period 16–22 days; post-fledging dependence extended, juvenile capable of self-feeding at 4 weeks but fed by parent for 5–12 weeks, may remain on territory to help in later breeding attempt. Mean productivity 0·98 fledged young per pair per year, and adult annual recruitment 0·47 per pair, reproductive output correlated with invertebrate abundance in leaf litter and soil. Chick loss most frequent in week after hatching; nest predation by indigenous reptiles occurs, and in the past compounded by effects of various introduced competitors and predators. Mean adult annual mortality 15·6%. Breeds at 1 year. Oldest recorded individual 14 years.

Movements. Sedentary. Capable of over-water dispersal to other islands; longest recorded movement 45 km from Aride to Denis by young female in Aug/Sept 2004.

Status and Conservation. CRITICAL. Restricted-range species: present in Granitic Seychelles EBA. Global population steadily recovering from all-time low of 12–15 birds on Frégate in 1965. Former range included Mahé, Praslin, La Digue, Marianne, Aride, South-east Island, St Anne and probably others, from where the species disappeared mostly between 1878 and the 1930s, for unknown reasons, although several highly deleterious factors are introduced cats, introduced rats, habitat conversion and human persecution; a population introduced on Alphonse in 1892 flourished for several decades, but then died out, probably as a result of introduced cats. Attempts at translocations in 1970s unsuccessful, and population failed to recover even after cat eradication on Frégate in 1982, owing to habitat changes rendering territories unsuitable. After the start, in 1990, of new intervention involving habitat management, population increased to 48, and two individuals translocated to Aride. In next five years further translocations took place, establishing new populations on Cousin and Cousine, and near end of 1999 global total was 85 birds (46 on Frégate, 23 on Cousin, 15 on Cousine and one on Aride), although studies of vertebrate and invertebrate densities on Cousine suggested that the island could hold only about six breeding pairs, and even these might not be self-sustaining over time. In subsequent five years to mid-2004 numbers rose to 67 on Frégate, 36 on Cousin, 22 on Cousine and 15 on Aride, giving global total of 140. The species' formal Recovery Programme, established in Sept 1991 by BirdLife International, has a target of 200 individuals distributed among six islands by 2006. Various threats have had to be addressed, most significant of which are introduced predators, in particular cats (removed from Frégate in 1982) and brown rats (*Rattus norvegicus*) (eradicated from Frégate in 2000), but also the colonizing Common Barn-owl (*Tyto alba*) and Common Myna; islands used in translocations are free of these four predators, but rats became established on Frégate within a decade of the cats being eradicated. Meanwhile, abandonment of plantations has allowed encroachment of dense cover in territories, reducing suitability; food shortages have occurred close to nests, pesticides have potentially contaminated birds (eating of dead insects swept from houses), and pathogenic infections have afflicted the Aride population. Breeding success has been enhanced by habitat creation, supplementary feeding, nest protection, provision of nestboxes, and direct control of mynas and owls, and long-term investment in habitat has included planting of several thousand trees on Frégate.

Bibliography. Bougrain-Dubourg (1992), Brunnstein (1994), Collar & Stuart (1985), Gaymer *et al.* (1969), Gerlach (1997), Gerlach & Le Maitre (2001), Gretton (1993), Hockey (1997), Komdeur (1996), Le Maitre (2002), Lucking & Lucking (1997), Lucking *et al.* (1997), McCulloch (1994, 1996), Millett *et al.* (2003), Njoroge (2002), Norris & McCulloch (2003), Penny (1968), Shah (2001), Shah & Parr (1999), Shah *et al.* (2003), Skerrett *et al.* (2001), Stattersfield & Capper (2000), Thorsen *et al.* (2000), Vesey-Fitzgerald (1940), Wagner (2001), Watson *et al.* (1992), Wilson & Wilson (1978).

260. **Madagascar Magpie-robin**

Copsychus albospecularis

French: Shama de Madagascar **German**: Madagaskardajal **Spanish**: Shama Malgache

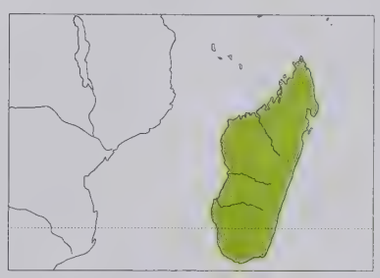
Taxonomy. *Turdus albo-specularis* Eydoux and Gervais, 1836, Maroantsetra, north-eastern Madagascar. May form a superspecies with *C. sechellarum* and *C. saularis*. Considerable overlap among races, and intergradation occurs in belly colour of males, e.g. at Zahamena, in CE Madagascar; width of intergradation zone not clear. Birds from around Ihosy described as race *winterbottomi*, male with all-black tail, female with extensive white spots on outer three rectrices and white outer webs of two longest secondaries; included within *inexpectatus*, but may warrant recognition. Three subspecies recognized.

Subspecies and Distribution.

C. a. pica Pelzeln, 1858 – N, W & SW Madagascar.

C. a. albospecularis (Eydoux & Gervais, 1836) – NE Madagascar.

C. a. inexpectatus Richmond, 1897 – EC to SE Madagascar.



Descriptive notes. 18 cm; 21–24 g. Male nominate race is black, with white shoulder patch and white fringes on vent. Distinguished from similar *C. sechellarum* by smaller size, shorter tail, more rounded head, shorter bill. Female differs from male in having dark grey-brown crown to tail, grey chin to belly. Juvenile male like male but with drabber plumage, whitish throat, yellow cutting edges of bill; juvenile female like female but with small brown spots on top of head, mantle and scapulars, and fawn-edged underparts. Race *pica* is smaller, male has white abdomen, greater coverts, outer fringes of tertials, and outer tail feathers, female also paler; race *inexpectatus* male has whitish belly and vent. Voice. Song a series of clear, high-pitched warbled and trilled notes, fairly quiet and often given in discrete phrases with several seconds' separation. Reputedly also duets, in which female answers with shorter sequence at lower volume, and may also give a few loud, fluting notes alone at dusk. May mimic other species. Alarm call variously described as shrill, harsh, resonant "tree tree tree", high, single off-key whistled "tseeeeeee", and buzzing "cheet".

Habitat. Race *pica* in thick dry coastal scrub, dry monsoon forest, intact and degraded spiny forest, rainforest and overgrown *Cryptomeria* plantations; heavy rainforest interior (nominate race), and closed-canopy humid forest, littoral forest, forest edge, secondary growth and adjacent *Eucalyptus* plantations and gardens (*inexpectatus*). Also coffee, cacao and banana plantations and mangroves. Sea-level to 1800 m.

Food and Feeding. Insects (including cockroaches, orthopterans, bugs, adult and larval beetles, and ants), spiders, small amphibians and geckos, isopods, earthworms; sometimes berries. Forages by gleaning on forest floor and among undergrowth, sometimes emerging into clearings. Females seem to use ground more than do males, which tend to occupy undergrowth and middle levels. Sometimes joins mixed-species foraging flocks.

Breeding. Birds in breeding condition late Sept to late Dec; nests in Oct–Feb, in E of island also to Jun. Estimated territory size of race *pica* ranges from less than 1 ha in dense undergrowth in tall, high-altitude forest to 6 ha in tall scrub on coastal dunes; for *inexpectatus* 1–3 ha, again smallest in heavy rainforest. Nest a cup made of grasses, leaf stalks and moss, placed on base of varying thickness and lined with fine rootlets, snakeskin and hairs of lemurs and zebu, placed in hollow in earth wall along forest path, in tree cavity behind hanging vegetation, on stump top, or in thick undergrowth; also recorded in banana trees, bamboo, epiphytic ferns, spiny *Euphorbia stenoclada*, and on moss-clad rock. Eggs 2–5 (usually 3), shiny blue-green, mottled brown and violet-grey; incubation and nestling periods reportedly 13 days, in captivity nestling period 17 days; young seen fed by adults 6 days after fledging, and family party still together 18 days after fledging. Much predation by Madagascar Sparrowhawk (*Accipiter madagascariensis*).

Movements. Apparently sedentary.

Status and Conservation. Not globally threatened. Scattered but relatively common. Densities vary with habitat; highest in heavy forest. One of the most frequently encountered species in the Zombitse-Vohibasia National Park.

Bibliography. Benson *et al.* (1977), Dee (1986), Farkas (1972, 1985), Goodman & Benstead (2003), Goodman *et al.* (1997), Hawkins *et al.* (1998), Langrand (1990), Milon *et al.* (1973), Morris & Hawkins (1998), Mustoe *et al.* (2000), Quansah (1988), Rand (1936), Safford & Duckworth (1990), van Someren (1947), Thompson & Evans (1991).



PLATE 74

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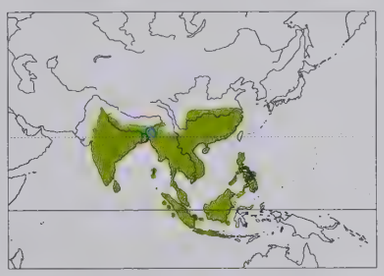
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261. Oriental Magpie-robin

Copsychus saularis

French: Shama dayal **German**: Dajaldrossel **Spanish**: Shama Oriental
Other common names: Magpie Robin

Taxonomy. *Gracula Saularis* Linnaeus, 1758, Bengal, India.
May form a superspecies with *C. sechellarum* and *C. albospecularis*. Races form three basic groups: "nominate group" (white belly, white in tail), "*amoenus* group" (black belly, white in tail), and "*mindanensis* group" (white belly, black tail). Described race *problematicus* from Borneo is an intergrade between *musicus* and *pluto*. Several other named races are poorly differentiated or part of clinal variation, or based on very small sample sizes: *erimelas* (NE India E to Indochina) and *prosthopellus* (China and Hainan) synonymized with nominate, and *zacnecus* (Simeulue I), *nesiarchus* (Nias I), *masculus* (Batu Is), *pagiensis* (Mentawai) and *javensis* (W Java) with *musicus*. Proposed Philippine race *deuteronymus* (Luzon), separated on lightly barred buff wash of lower underparts of female, also regarded as too weak to merit recognition and thus merged with *mindanensis*. Eight subspecies recognized.
Subspecies and Distribution.
C. s. saularis (Linnaeus, 1758) – NE Pakistan and India E to S & E China (including Hainan I), S to Thailand and Indochina.
C. s. ceylonensis P. L. Sclater, 1861 – S India and Sri Lanka.
C. s. andamanensis Hume, 1874 – Andaman Is.
C. s. musicus (Raffles, 1822) – S Thailand and Peninsular Malaysia S to Sumatra (including islands of Simeulue, Nias, Batu, Belitung, Bangka), W Java and S & W Borneo.
C. s. amoenus (Horsfield, 1821) – E Java and Bali.
C. s. pluto Bonaparte, 1850 – N, E & SE Borneo and Maratua I.
C. s. adamsi Elliot, 1890 – extreme N coastal Borneo and adjacent islands.
C. s. mindanensis (Boddaert, 1783) – Philippines.



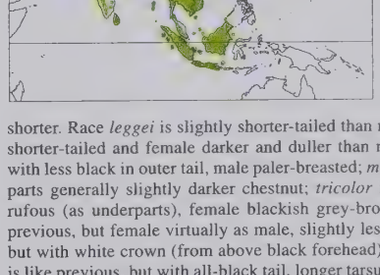
Descriptive notes. 19–21 cm; 29–41 g. Male nominate race is glossy blue-black above and on breast, with white belly (slight patchy buff tinge around vent), white bands along wing, white sides of longish graduated tail; black bill and legs. Female is like male but black replaced with grey, except on wings. Juvenile is dark brownish-grey with blackish mottling above, whitish bands on wing, rufous wing edgings, mottled dark on buff on face, breast and flanks, belly to vent whitish. Race *ceylonensis* female is considerably darker grey; *andamanensis* is heavier-billed and shorter-tailed, female somewhat darker than nominate; *musicus* female is glossier dorsally; *amoenus* male is all black below, female all grey below; *pluto* male is like previous but larger; *adamsi* is larger again, and in pure form (many intergrades with preceding) male entirely glossy black except greater upperwing-coverts; *mindanensis* is like nominate but tail all black. Voice. Song, from conspicuous perch, sometimes in flight, full and varied, but not rich as in *C. malabaricus*, a clear thin ethereal warbling with repeated short churrs and upslurred or downslurred whistles, e.g. "suiii-suuh-swiit-swer-swiit-siiuh", including mimicry; often as antiphonal duet; in Sabah evidence of local dialects in songs. Calls include six main types (territorial calls, dawn emergence and roosting calls, threat calls, submissive calls, begging calls and distress calls), of which following best known: a long-drawn plaintive hissing, "swee-ee" (this presumably the peculiar "psiss psiss psiss" reported for birds going to roost); in alarm a harsh "chr-r" or "che'e'e'e'h" and a "zeee tet-tet" (number of "tet" variable); also "hweep-hweep".
Habitat. Dry deciduous forest but preferring presence of shady evergreen trees, disturbed peatswamp-forest, open teak forest, banks of large rivers through forest, forest edge along logging tracks, bamboo and the introduced *Eupatorium odoratum*, secondary jungle, gardens, compounds, orchards, parkland, coconut groves, tall tree plantations, field patches, hedges, village environs, creekside scrub jungle, beach strand vegetation, cocoa under *Albizia*, mangroves, clearings, refuse tips; lowlands to 1900 m (to 1450 m in Borneo, but mainly 1000 m). Nearly always close to human settlements in Vietnam; often in riverside vegetation in Borneo.
Food and Feeding. Mainly insects, notably crickets, beetles (including weevils, scarabs, ladybirds), locustids, ants, firebugs, caterpillars, wasps, termites and flies (especially dungflies) and their maggots; also other invertebrates, including leeches, earthworms, molluscs, millipedes, crabs and in particular spiders, and small vertebrates such as geckos and fish; also nectar of e.g. *Salmalia* and *Erythrina*, and seeds and fallen wild fruit. Twelve stomachs from C India held many *Camponotus* ants, also *Myllocercus* weevils, mole-crickets (*Gryllotalpa*), grasshoppers (*Chrotogonus*), earthworms, beetles, larvae and small bees. Small caterpillars seen fed to nestlings. Feeds largely on ground, hopping about in upright stance, with tail pumping over back, wings partly drooped; also recorded as hawking winged termites.
Breeding. Apr–Jul in India and all year (except, apparently, Oct) in Sri Lanka; Feb–Aug in China; Jan–Sept in SE Asia; Apr–Jun in Philippines; Jan–May in N Borneo; Mar–Jul in Sumatra, but with still-dependent young Oct; Jan–Nov, peak Apr–Jun, in Java; two or three broods, at least in Peninsular Malaysia and Hong Kong. Nest a small or bulky but always untidy pad of grass, rootlets, pine needles, palm fronds, fibres, hair, feathers, snakeskin etc., placed 2–7 m up in hole in old wall, roof of house, bamboo clump, discarded hollowed bamboo pole, overhanging roots, cavity in bank, tree trunk or branch; nest reused for subsequent broods. Eggs 2–5 (2–3 in Java, usually 2 in Philippines), pale blue-green to green with reddish-brown blotching and mottling; incubation period 12–13 days; no information on nestling period. In one study, eleven of 14 nests produced young, and comparable results calculated from other datasets. Oldest recorded individual at least 6 years.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common to very common in India and Sri Lanka. Common in S China, and abundant Hong Kong. One of the most familiar birds in Myanmar, and very common throughout Thailand. In Philippines, fairly common in cultivated lowlands on Mindoro, but throughout country generally uncommon; common at Cayapa, on Luzon, but uncommon elsewhere in Sierra Madre. Very common throughout cultivated lowlands of Borneo, and in Kelabit Highlands and Mt Kinabalu, although uncommon in Barito Ulu area of C Kalimantan; possibly one of the few species of bird on the island to have improved its status owing to oil palm plantations. Common in Sumatra and its islands; in Java fairly common around mid-1980s but then reported as becoming scarce owing to trapping for cagebird trade. In Singapore judged one of three commonest bird species in 1920s, but now uncommon to rare (known population in mid-1980s fewer than 20 birds), having declined drastically since 1960s owing to poaching, habitat loss and competition with mynas; controlled reintroduction in Botanic Gardens has established a small population.
Bibliography. Acharya (1931), Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Bhatt & Kumar (1994), Bhatt *et al.* (2000), Caldwell & Caldwell (1931), Carey *et al.* (2001), Chasen & Kloss (1930), Cheng Tsohsin (1964, 1987), Danielsen *et al.* (1994), Deignan (1945), Delacour & Jabouille (1931), Dharmakumarsinhji (1955), Dickinson *et al.* (1991), Duckworth, Davidson & Timmins (1999), Glenister (1971), Grimmett *et al.* (1998), Hails & Jarvis (1987), Harrison (1999), Henry (1998b), Herklots (1967), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Kennedy *et al.* (2000), Kumar (1993), Kumar & Bhatt (2001a, 2001b), Legge (1983), Lekagul & Round (1991), Lim Kim Seng (1992, 1997), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Martens & Eck (1995), Medway & Wells (1976), Mees (1986, 1996), Meyer de Schauensee (1984), Naidu (1980), Narayanan (1984), Nash & Nash (1985), Pillai (1956), Rasmussen & Anderton (2005), Ripley & Rabor (1958), Roberts (1992), Robson (2000), Sheldon *et al.* (2001), Smythies (1986, 1999), Sowerby (1943), Taher (1990), Umar (1995), Ward (1946), Wilkinson, Dutson & Sheldon (1991), Zheng Guangmei & Zhang Cizu (2002).

262. White-rumped Shama

Copsychus malabaricus

French: Shama à croupion blanc **German**: Schamadrossel **Spanish**: Shama Culiblanco
Other common names: Shama; White-crowned Shama (*stricklandii*)

Taxonomy. *Muscicapa malabarica* Scopoli, 1788, Mahé, Malabar, India.
Race *stricklandii* (together with *barbouri*) commonly treated as a separate species, but intergrades with *suavis* over a zone almost 300 km wide. Distinctive insular race *albiventris* putatively worthy of species status; detailed analysis needed. Additional described races based on minor differences and small sample sizes: *indicus* (Nepal E to N Indochina), *pellogynus* (SE Myanmar, Peninsular Thailand) and *minor* (Hainan I) regarded as synonyms of *interpositus*; *mallopercnus* (W Malaysia), *javanus* (W & C Java), *omissus* (E Java), *eumesus* (Natuna Is) and *ochroptilus* (Anamba Is) as synonyms of *tricolor*; and *opisthopelus* (Batu Is) and *opisthisus* (Banyak Is) as synonyms of *melanurus*. It seems rather improbable that characters of *macrourus* will prove constant, in which case this name would apply to all populations currently placed in *interpositus*. Twelve subspecies currently recognized.
Subspecies and Distribution.
C. m. malabaricus (Scopoli, 1786) – W & S India.
C. m. leggei (Whistler, 1941) – Sri Lanka.
C. m. interpositus (Robinson & Kloss, 1922) – Nepal, N, CE & NE India, Myanmar, S China (S Yunnan), Thailand and Indochina.
C. m. macrourus (J. F. Gmelin, 1789) – Con Son I, in S Vietnam.
C. m. albiventris (Blyth, 1859) – Andaman Is.
C. m. tricolor (Vieillot, 1818) – W Malaysia, Sumatra, Java, Bangka, Belitung, Natuna Is and Anamba Is.
C. m. melanurus (Salvadori, 1887) – W Sumatran islands (except Enggano).
C. m. mirabilis Hoogerwerf, 1962 – Prinsen I.
C. m. nigricauda (Vorderman, 1893) – Kangean I.
C. m. stricklandii Motley & Dillwyn, 1855 – N Borneo, including Banggi I.
C. m. suavis P. L. Sclater, 1861 – Borneo (Sarawak and Kalimantan).
C. m. barbouri (Bangs & J. L. Peters, 1927) – Maratua Is, in E Borneo.
Introduced (reportedly race *interpositus*) in Hawaii (now on Kauai and Oahu).



Descriptive notes. 21–28 cm (including male tail 7 cm); 31–42 g. Long graduated tail. Male nominate race has glossy blue-black hood to back, less glossy grey-black wings and tail, white rump and outer rectrices; mid-breast to vent orange-rufous, thighs whitish; bill black, legs pinkish. Female is like male, but matt grey on hood to back and wings, tail shorter, slightly greyer (but in some areas may look virtually identical to male; this possibly a geographical variation or an age factor, or both). Juvenile is blackish-brown with few buff streaks above, buff with brown scales from chin to breast and flanks, whitish belly to vent, tail as female but shorter. Race *leggei* is slightly shorter-tailed than nominate, female very like male; *interpositus* is shorter-tailed and female darker and duller than nominate; *macrourus* is similar to previous but with less black in outer tail, male paler-breasted; *melanurus* is also similar, but tail all black, underparts generally slightly darker chestnut; *tricolor* is also very similar, but thigh feathers orange-rufous (as underparts), female blackish grey-brown on throat, shorter-tailed; *suavis* resembles previous, but female virtually as male, slightly less glossy on breast; *stricklandii* is very like last, but with white crown (from above black forehead) to nape, usually with flecks of black; *barbouri* is like previous, but with all-black tail, longer tarsus and wing; *nigricauda* has tail almost all black, few white tips on outer feathers, and underparts rufous-orange without chestnut tone, sexes similar except female much shorter-tailed; *albiventris* has underparts below hood white, tinged orange-buff around vent, tail shorter, sexes similar but female slightly duller and shorter-tailed, juvenile lightly buff-streaked blackish above, rufous-mottled rufous-buff on breast and flanks. Voice. Song one of the finest of any bird within its range, a series of powerful rich fluty melodious phrases, very thrush-like and musical, and incorporating much mimicry (introduced population in Hawaii sings throughout year); female has short simple song delivered only in breeding season and in presence of mate. At least *nigricauda* and *tricolor* have louder, deeper and fuller songs than those on mainland. Call in alarm a harsh scolding "tshak", possibly same as "krr-krr", and bill-snapping heard in aggression; at dusk male makes strange clicking noise in flight across clearings (attributed to wing-clapping), also when perched.
Habitat. Undergrowth of logged and unlogged mixed dipterocarp forest, teak forest, mixed bamboo forest, secondary jungle, clearings in forest, overgrown tree plantations (including rubber and

On following pages: 263. White-browed Shama (*Copsychus luzoniensis*); 264. White-vented Shama (*Copsychus niger*); 265. Black Shama (*Copsychus cebuensis*); 266. Rufous-tailed Shama (*Trichixos pyrropygus*); 267. Indian Robin (*Saxicoloides fulicatus*).

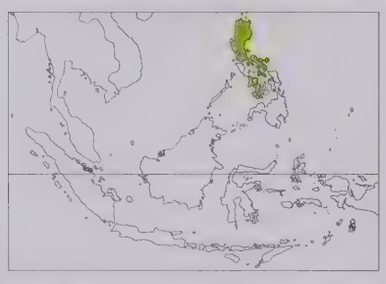
oil palm), mangroves, coastal vegetation, tidal riverine swamp-forest and kerangas; lowlands to 500–600 m (to 1200 m in N Borneo, to 1500 m in Thailand), preferring shady ravines. In C Borneo found in treefall gaps, along streams and in secondary areas within lowland primary forest. In N Thailand, sometimes found in villages in gardens shaded by large fruit trees and in ancient clumps of giant bamboo overhanging drainage ditches.
Food and Feeding. Mainly arthropods, including ants, caterpillars, moths, beetles, flies, grasshoppers, centipedes, spiders, also worms and berries. In Hawaii (introduced population), food fed to nestlings included adult insects (53%), earthworms (36%), unidentified arthropods (less than 8%), arthropod larvae or pupae (less than 3%) and skinks (less than 1%). Forages on ground and in low vegetation, gleaning from leaves and earth, occasionally sallying after flying insects. Rather crepuscular.
Breeding. Apr–Jun in India and Sri Lanka; May–Jul in China; Mar–May in Myanmar; Mar–Aug in Peninsular Malaysia; Sept–Oct and Jan–Mar (fledglings Jun–Oct, breeding-condition birds Feb and Jun–Oct) in Borneo; Apr in Sumatra and May and Aug in C Java. Introduced population in Hawaii breeds Mar–Aug, and commonly double-brooded; mean territory size 0·09 ha in Hawaii (study population in area provisioned with nestboxes); co-operative breeding (extra male at nest with young) observed twice. Nest a shallow cup of rootlets, fibres, grass, bamboo leaves, etc., placed generally 2–5 m up in natural hollow in tree trunk, stump top or base of bamboo clump. Eggs 2–4 (5 in China, 2–3 in Java), pale greenish to buffish with pale brown, umber and dark lilac flecking; incubation period (Hawaii) 13·6 days; nestling period 12·4 days; post-fledging dependence up to 26 days, juveniles remained within natal territory for up to 54 days. In Hawaii, reproductive success for double-brooders 91% and for single-brooders 62%. Oldest recorded individual at least 4·5 years.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Somewhat local but fairly common in India. Common in dry zone, less so in wet zone, in Sri Lanka. Common in foothill forests in Myanmar. Very common in Thailand. Common throughout Vietnam, at least until 1960s. Very rare, almost extinct, on mainland Singapore, but recorded (possibly escapes) on some islands; captive-breeding programme called for to supply demand for singing cagebirds, allowing restocking of wild populations. Common in Barito Ulu area of C Kalimantan, in Borneo. By mid-1980s rare in Java owing to trapping for cagebird trade; Kangean race *nigricauda* also now reportedly rare because of trade, and the survival of this taxon could be in question. Introduced and common on Kauai and Oahu, in Hawaiian Is.
Bibliography. Aguon & Conant (1994), Ali (1977, 1996), Ali & Ripley (1987b), Anon. (1998b), Chasen & Kloss (1930), Cheng Tsohsin (1987), Collar (2004b), Davison (1999), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Glenister (1971), Grimmett *et al.* (1998), Hachfeld (2004a), Hails & Jarvis (1987), Harrison (1999), Henry (1998b), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Kopmeier (1987), Legge (1983), Lekagul & Round (1991), Lim Kim Seng (1992, 1997), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), van Marle & Voous (1988), Mathew *et al.* (1990), Medway & Wells (1976), Mees (1986, 1996), Meyer de Schauensee (1984), Pratt *et al.* (1987), Rasmussen & Anderton (2005), Robson (2000), Schmidt (1988b), Sheldon *et al.* (2001), Smythies (1986, 1999), Tretzel (1997), Wildash (1968), Wilkinson *et al.* (1991), Zheng Guangmei & Zhang Cizu (2002), Zysk (1987).

263. White-browed Shama

Copsychus luzoniensis

French: Shama bridé **German**: Brauenschama **Spanish**: Shama de Luzón
Other common names: White-eyebrowed Shama

Taxonomy. *Turdus luzoniensis* Kittlitz, 1832, Luzon, Philippines.
Race *superciliaris* morphologically distinctive; if found to be equally distinctive vocally, may perhaps be better treated as a separate species. Race *parvimaculatus* only rather weakly differentiated from nominate; *shemleyi* poorly known, and validity has been questioned. Four subspecies currently recognized.
Subspecies and Distribution.
C. l. luzoniensis (Kittlitz, 1832) – Luzon and Catanduanes, in N Philippines.
C. l. parvimaculatus (McGregor, 1910) – Polillo I.
C. l. shemleyi duPont, 1976 – Marinduque.
C. l. superciliaris (Bourns & Worcester, 1894) – Masbate, Negros, Panay and Ticao.



Descriptive notes. 17–18 cm. Male nominate race is bluish-black from head to back and wings and breast, with white supercilium from over lores to nape, white wing patch, white belly shading rufous on flanks and thighs and up onto rump; tail black, white tips on outer four graduated feathers; bill black, legs pinkish-flesh. Female has olive-brown crown, grey-brown back, pale grey throat. Juvenile apparently undescribed. Race *parvimaculatus* similar to nominate, but has darker rump, and smaller white tail tips; *shemleyi* also has darker rump, but slightly larger white tail tips than nominate, female has white throat bordered by grey, reduced white in wing; *superciliaris* lacks rufous rump and white wing patch, female has white throat bordered by a black band. Voice. Song a long, loud series of clear, melodious phrases each lasting c. 11 seconds with 15–20 seconds' pause, and consisting of whistles and gurgles, rising and falling, often ending on high note.
Habitat. Primary forest and second growth, usually below 1000 m.
Food and Feeding. No information.
Breeding. Apr–May. Nest a cup made of grass and dry leaves, placed low down in hollow stump or limb. Eggs 2, pale green with heavy reddish-brown blotches. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common.
Bibliography. Brooks *et al.* (1992), Danielsen *et al.* (1994), Delacour & Mayr (1946), Dickinson *et al.* (1991), Erritzoe (1995), Kennedy *et al.* (2000), Ogilvie-Grant (1894), Pardo & Gogorza y González (1997).

264. White-vented Shama

Copsychus niger

French: Shama noir **German**: Mohrendajal **Spanish**: Shama de Palawan
Other common names: Palawan/Black(!) Shama

Taxonomy. *Cittocincla nigra* Sharpe, 1877, Palawan, Philippines.
May form a superspecies with *C. cebuensis*. Has sometimes been considered closely related to, and possibly conspecific with, *C. saularis*. Monotypic.
Distribution. Calamian Is, Palawan and Balabac, in W Philippines.



Descriptive notes. 18–21 cm. All glossy black, with white undertail-coverts and white four outer feathers of long graduated tail; bill and legs black. Sexes similar. Juvenile is blackish-blue above, with buff streaks on crown and spotting on scapulars, wings fringed and tipped rufous-brown, tail as adult; below, buffy-rufous and dark brown mottling on chin to mid-breast, darker brown belly, whitish on mid-belly to vent, with rufous-buff lower flanks. Voice. Song a loud, varied and melodious series of phrases repeated 2–3 times, rising and falling, then changing.
Habitat. Lowland forest and forest edge, second growth and scrub.
Food and Feeding. No information.
Breeding. Breeding-condition bird Jun and fledgling Aug. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Palawan EBA. Uncommon; perhaps locally fairly common.
Bibliography. Delacour & Mayr (1946), Dickinson *et al.* (1991), Erritzoe (1995), Kennedy *et al.* (2000), Pardo & Gogorza y González (1997).

265. Black Shama

Copsychus cebuensis

French: Shama de Cebu **German**: Cebuschama **Spanish**: Shama de Cebú
Other common names: Cebu Shama

Taxonomy. *Cittocincla cebuensis* Steere, 1890, no locality = Cebu Island, Philippines.
May form a superspecies with *C. niger*. Monotypic.
Distribution. Cebu, in SC Philippines.



Descriptive notes. 20 cm. Male is glossy blue-black, with long graduated tail, black bill and legs. Female is similar but blackish-grey. Juvenile undescribed; immature greyer than adult, with brownish wings. Voice. Song a long series of rich, varied whistled phrases, rising and falling, with quick changes of direction, sometimes involving mimicry of other bird species, each phrase lasting up to 20 seconds.
Habitat. Primary forest (almost none remaining) and dense undergrowth of secondary habitats, including scrub, thickets, cut-over forest, plantations, undergrowth, vegetated ravines and bamboo stands; appears to favour areas in valley bottoms, with or without water.
Food and Feeding. Small black beetles found in one stomach. Forages on ground and in low vegetation. No other published information, but flycatching reported as common behaviour.
Breeding. Feb–Sept. Nest a cup often placed in broken end of large bamboo stalk. Eggs 2–3. No other information.
Movements. Presumably sedentary.
Status and Conservation. ENDANGERED. Restricted-range species: present in Cebu EBA. Population placed in range 1000–2500 mature individuals, but these figures may be too high; considered in decline. Has been considered very rare ever since its discovery, owing to near-total deforestation of Cebu well before start of 20th century. Post-1990 records from at least 15 sites, but most of these hold only small numbers. Largest single known site, at Casili, reportedly holds c. 50 birds in area of c. 10 km²; this area is threatened by local housing development. Another site, Tabunan, containing c. 3 km² of habitat, is situated inside Central Cebu National Park, but is under major threat from squatting families claiming land rights, despite its protected area status and various recent initiatives to preserve it. A third site, Nug-as, is much more promising in terms of long-term prospects for habitat conservation, but local population size still unclear. The species is currently under study at Nug-as by the Cebu Biodiversity Conservation Foundation.
Bibliography. Brooks, Magsalay *et al.* (1995), Collar *et al.* (2001), Dickinson *et al.* (1991), Dutson *et al.* (1993), Gonzales & Rees (1988), Hachisuka (1936), Kennedy *et al.* (2000), Magsalay (1993), Magsalay *et al.* (1995), McGregor (1907, 1909–1910), Rabor (1959), Stattersfield & Capper (2000).

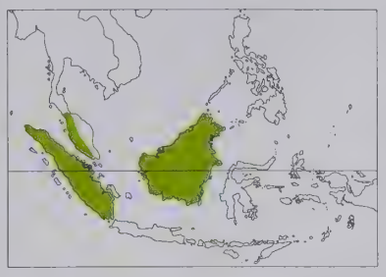
Genus *TRICHIXOS* Lesson, 1839

266. Rufous-tailed Shama

Trichixos pyrropygus

French: Shama à queue rousse **German**: Feuerschwanzschama **Spanish**: Shama Colirrufo
Other common names: Orange-tailed Shama

Taxonomy. *Trichixos pyrropyga* Lesson, 1839, Sumatra.
Sometimes placed in genus *Copsychus*. Genus name is masculine, species name is adjective, so, despite original spelling, species name must be corrected to masculine form. Monotypic.
Distribution. Extreme S Thailand, W Peninsular Malaysia, Sumatra and Borneo.
Descriptive notes. 20–22 cm; 41–46 g. Stout-billed and short-tailed shama. Male has bluish grey-black head to back and wings and breast, with short white preocular supercilium, orange-rufous mid-breast to rump and tail, last with blackish terminal band, whitish belly to undertail-coverts;



bill black, legs pinkish. Female is grey-brown above, throat, breast and flanks rufous-orange, belly to undertail white, tail as male. Juvenile is like female but initially streaked rufous-buff above (and retaining rufous-buff wingbar), more heavily streaked on breast. Voice. Song a loud series of slow, mournful, often glissading whistles, several on one pitch before shifting to another, e.g. "whi-iii whi-iii whi-uuu", uttered in no set pattern. Call a scolding drawn-out "tchurr", recalling that of *Copsychus saularis*.

Habitat. Lower storey of lowland and hill-slope primary broadleaf evergreen forest (less common in logged forest), including mixed dipterocarp, coastal peatswamp-forest and upland heath forest, ultrabasic forest, also burnt alluvial forest; once in *Albizia* plantation and once in modern rubber plantation. Sea-level to 1200 m, mainly below 900 m; in N Borneo 50–600 m. Tends to occur in forest on poorer soils more than does commoner *Copsychus malabaricus*.

Food and Feeding. Invertebrates ("insects"), so far as is known, with beetles recorded in one stomach; much more powerful bill and larger head than *Copsychus malabaricus* suggest that it consumes food which is in some way unavailable to latter. Forages in trees and on ground, gleaning from leaves and earth.

Breeding. Juveniles in Feb and Apr in Peninsular Malaysia; breeding-condition birds Feb–Jun in N Borneo; parent carrying food late Aug in Sumatra. No further information.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Currently considered Near-threatened. Forest destruction in Sundaic lowlands has been so severe that all primary formations predicted to disappear by 2010; this species must have declined substantially, but maintains populations on slopes which are less at risk. Rare in extreme in S Thailand and scarce to uncommon in Peninsular Malaysia; uncommon in Sumatra. In Borneo, uncommon in Danum Valley Conservation Area (but probably frequently overlooked) and elsewhere in N (Sabah), and uncommon in Barito Ulu area and in Tanjung Puting National Park (C Kalimantan); although rather few sightings, widespread in tall forest on basis of frequency with which call heard.

Bibliography. Chasen & Hoogerwerf (1941), Danielsen & Heegaard (1995), David & Gosselin (2002a), Duckworth *et al.* (1996), Glenister (1971), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Medway & Wells (1976), Nash & Nash (1988), Robson (2000), Sheldon *et al.* (2001), Stattersfield & Capper (2000), Wilkinson *et al.* (1991).

Genus *SAXICOLOIDES* Lesson, 1832

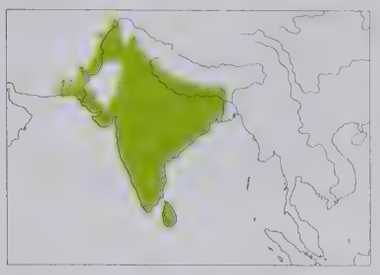
267. **Indian Robin**

Saxicoloides fulicatus

French: Pseudotraquet indien **German**: Strauchschmätzer **Spanish**: Tarabilla Terrestre
Other common names: Indian Chat(!); Black-backed Robin (nominate); Brown-backed (Indian) Robin (*cambaiensis*)

Taxonomy. (*Motacilla*) *fulicata* Linnaeus, 1766, Philippines; error = Pondicherry, India.
Scutellate tarsi and slightly decurved bill render systematic position of genus uncertain. Races intergrade. Five subspecies recognized.

Subspecies and Distribution.
S. f. cambaiensis (Latham, 1790) – Pakistan, N & W India and S Nepal.
S. f. erythrurus (Lesson, 1831) – NE India.
S. f. intermedius Whistler & Kinnear, 1932 – C India.
S. f. fulicatus (Linnaeus, 1766) – S India.
S. f. leucopterus (Lesson, 1840) – Sri Lanka.



Descriptive notes. c. 16 cm; 17–20 g. Male nominate race is glossy black above and below, with white shoulder patch and chestnut vent; long black tail typically cocked; black bill and legs. Female is brownish-grey above with browner ear-coverts, dark grey below, chestnut vent. Juvenile is like female but darker, throat lightly mottled buff-white. Race *cambaiensis* male is mid-brown above, female paler than nominate; *erythrurus* is dark brown above; *intermedius* is very dark brown above; *leucopterus* is larger and shorter-tailed, female darker. Voice. Song a very short, high-pitched, creaky squeaky jumble of 4–5 notes in minor key, used in direct confrontations with intruding conspecifics; lasts less than 0·5 seconds, repeated every 5–6 seconds. Calls include merry "cheery-wee" or "pi-peear", uttered at intervals, apparently serving as territorial advertising "song"; short clear upslurred whistle, "sfveit!"; harsh scolding "cheee" towards potential predators; and harsh "chur-r" in greater alarm.

Habitat. Palm groves, bare hillsides, open rocky places, newly burnt clearings, cultivated "cheenas", stony "patnas", arid stony escarpments, low rocky outcrops, low open scrub with scattered trees, saltpans and sand dunes dotted with stunted *Tamarix* and *Prosopis*, stony scrub around human settlements, gardens, graveyards, deserted buildings, villages and dwellings; often perching on roofs and entering verandas. Lowlands, to 1600 m Sri Lanka. In Pakistan the most typical bird of wild olive (*Olea cuspidata*) and *Acacia modesta* thorn-scrub.

Food and Feeding. Insects (including termites, ants, beetles, flies, caterpillars, grasshoppers, bees and wasps) and their eggs, spiders; marked preference for termites. One record of gecko being struck from wall, battered and eaten, and one (same area) of small frog being caught, battered (8 minutes) and fed to young; probably same bird involved. Forages largely on ground, darting about with agile hopping gait and moving from spot to spot in short jerky flight, occasionally entering clumps of herbs or thorn bush, sometimes flipping over small stones and leaves with bill; very little aerial sallying. When feeding young, foraging behaviour includes use of wings and tail in attempts to flush insects.

Breeding. Mainly Apr–Jun in Pakistan and India but variable, Dec–Jul, even into Aug; Mar–Sept in Sri Lanka; two broods, sometimes three. Nest an untidy, fairly small pad of grass, rootlets and rubbish lined with feathers or hair, often adorned with sloughed snakeskin, placed under stone or clod of earth in ploughed field, in hole in old building, earth bank, tree or stump, in old pot or can, between tangled roots, down well-shaft, in old tomb cavity, under roof tiles or on veranda; nest-site often reused for additional broods. Eggs 2–4 (but up to 6, once 7, possibly fresh and abandoned eggs), pinkish-white to creamy-white, sometimes with greenish or yellowish tinge, speckled and blotched reddish; incubation period 11–13 days. No other information.

Movements. Sedentary.

Status and Conservation. Not globally threatened. Common in Pakistan and throughout Indian Subcontinent S of Himalayas; uncommon to rare in S Nepal. Very common in dry zone but less so in wet zone in Sri Lanka.

Bibliography. Ali (1996), Ali & Ripley (1987b), Bharos (1997), Culshaw (1948), Dharmakumarsinhji (1955), George (1961, 1963, 1964), Grimmett *et al.* (1998), Harrison (1999), Henry (1998b), Hüe & Etchécopar (1970), Inskipp & Inskipp (1991), Javed (1992), Legge (1983), Matzinger (1983), Mehta (1981), Naik (1963, 1964), Newnham (1893), Pershouse (1906), Pitman (1914), Rajasekhar (1993), Rasmussen & Anderton (2005), Roberts (1992), Shanbhag & Gramopadhye (1996), Sivasubramanian (1989), Stonor (1944), Thyagaraju (1955), Whistler (1914).


268
269
270
271
ssp *samamisicus*
273
ssp *ochruros*
ssp *rufiventris*
ssp *gibraltariensis*
272
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ssp *phoenicurus*
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inches 3
cm 8

PLATE 75

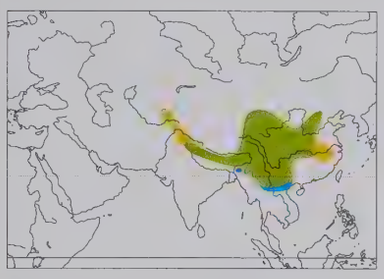
Genus *CHAIMARRORNIS* Hodgson, 1844

268. **White-capped Water-redstart**

Chaimarrornis leucocephalus

French: Torrentaire à calotte blanche **Spanish**: Colirrojo Acuático
German: Weißkopf-Rotschwanz
Other common names: White-capped Redstart, River Chat

Taxonomy. *Phoenicura leucocephala* Vigors, 1831, Simla-Almora district, Himalaya.
Has been placed in genus *Phoenicurus*, but differs in plumage pattern and behaviour. Monotypic.
Distribution. E Uzbekistan, Tadjikistan and Afghanistan (recently recorded Kyrgyzstan) E through Himalayas to C & NE China, N Myanmar and N Indochina.



Descriptive notes. 18–19 cm; 24–42 g. Bobs body after landing, and wags part-fanned tail while drooping wings. Has white cap, black rest of head to back and wings and down to breast; otherwise orange-chestnut, with black terminal tailbar; black bill and legs. Sexes similar. Juvenile is like adult but white cap scaled black, more grey-black above and extending below to lower belly, with paler buff-grey tips on lower breast to mid-belly, orange-grey vent. VOICE. Song a protracted melodious, undulating, but rather weak and melancholy whistling, "tieu-yieu-yieu-yieu", lasting less than 1 second, repeated every 5–6 seconds. Also, song by male during courtship of female variable and highly complicated, heard only at close range. Call a sharp shrill long-drawn upslurred "tseee" or "tseeit" or "shviiit!" in alarm, apparently also serving territorial purpose, and changing in quality with elevation, from 3900 m upwards in Nepal having a clinking timbre (and reported in N Thailand as a sharp "ping"); also a much-repeated "tik" and wheezy ascending "wheet".
Habitat. Breeds along larger rapid mountain streams, frequenting boulders among rushing water but visiting wet mossy cliffs and steep marshy hillsides; 1800–5100 m, mainly 2400–4200 m, in Himalayas. Winters by clear shingly rivers and canals from lowlands to foothills. In higher areas may nest in rocky alpine meadows several kilometres from running water; during vertical movements recorded as using urban buildings more than 1 km from nearest stream.
Food and Feeding. Insects, including ephemeropterans, dipteran flies, notably craneflies, beetles and ants, also spiders and molluscs; occasionally berries (including aroid berries and *Berberis*), grass seeds. Takes food from surface of water or in erratic flycatching sallies, also in dashes among rocks and by wading in shallow water. Occasionally forages for short periods away from water on rock-strewn ground and cliffs. In study in Nepal, 60% of observations of foraging position involved marginal rocks, 22% mid-river rocks, 15% riparian ground and 3% shoals or marginal ground; prey-picking techniques 40% from riparian ground or vegetation, 39% from rocks, 19% in aerial sally and 2% from shoals or mud.
Breeding. Season May–Jul/Aug; commonly double-brooded. Territory can be small in optimal habitat, pairs every 100–200 m of river. Nest a bulky, deepish cup of grass, moss and rootlets, strengthened with mud, lined thickly with rootlets, ferns and/or animal hair, placed deep in rock cleft or hole in tree or under overhanging bank, often in half-hollow end of broken trunk or log in riverbed, sometimes under stone or tree roots. Eggs 3–5, greenish or bluish-green with reddish-brown spotting and purplish-grey blotches; no information on incubation and fledging periods; young fed for 5–6 days after fledging.
Movements. Altitudinal and short-distance migrant. In China reported to move to S in winter. In Afghanistan and NW Himalayas makes elevational movements, but these less pronounced in area E from Kashmir and species present throughout year in some areas; in India descent to lower levels noted throughout Oct, with ascent in spring around end Mar and start Apr. Movement up to breeding areas in Nepal during Apr, some continuing to do so in May and Jun, following snow-melt. Subject to local movements in Laos.
Status and Conservation. Not globally threatened. Uncommon in mountains of C Asia. Locally common in Pakistan; in Kagan Valley one bird seen every 300 m over 96 km, with estimated 300 pairs on this stretch of river. Common in India. Common to very common in China. Uncommon to fairly common in N Myanmar and N Indochina; also common winter visitor to Myanmar foothills, but uncommon in N Thailand, where may be only non-breeding visitor.
Bibliography. Alexander (1949), Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Arlettaz *et al.* (1992), Bates & Lowther (1952), Cheng Tsohsin (1964, 1987), Daniel (1957), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Geduldig (1991), Grimmett *et al.* (1998), Hackney (1952), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Landmann & Winding (1993), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Manel, Buckton & Ormerod (2000), Manel, Dias *et al.* (1999), Martens & Eck (1995), Meyer de Schauensee (1984), Narang (1993), Orenstein (1979), Ormerod *et al.* (2000), Paludan (1959), Rasmussen & Anderton (2005), Reed (1980), Roberts (1992), Robson (2000), Smythies (1986), Tyler & Ormerod (1993), Vaurie (1972), Zheng Guangmei & Zhang Cizu (2002).

Genus *PHOENICURUS* T. Forster, 1817

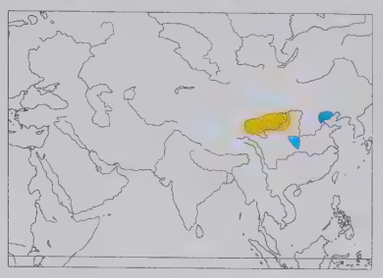
269. **Przevalski's Redstart**

Phoenicurus alaschanicus

French: Rougequeue de Przewalski **Spanish**: Colirrojo de Przewalski
German: Alaschanrotschwanz
Other common names: Alashan Redstart

Taxonomy. *Rutirilla* (sic) *alaschanica* Przevalski, 1876, Ala Shan, China.
Has been considered possibly conspecific with *P. erythronotus*. Monotypic.

Distribution. NC China (Qinghai, Gansu, Ningxia); non-breeding S Shaanxi, Shanxi, Hebei, Beijing.



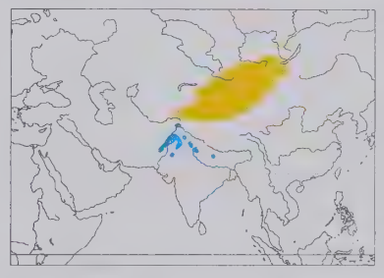
Descriptive notes. 16 cm. Male has pale bluish-grey head to upper mantle, chestnut-rufous lower mantle to rump; blackish wings with long broad white wing-covert bar and primary coverts, blackish tail with orange-rufous outer feathers; orange-rufous below, with whitish central belly; bill and legs black. Female is mid-brown above, slightly greyer buff below, wings brown with whitish-buff wingbars and edges. Juvenile undescribed. VOICE. Apparently unreported.
Habitat. Breeds on dense scrub-covered hillsides with loose rocks, in bush-dotted riverine plains, in upper coniferous montane forest belt from 3300 m to tree-line; winters down to 2000 m. Recorded in bushes of *Berberis* and *Hippophae* on passage in autumn, in *Nitraria schoberi* in spring.
Food and Feeding. No information. Apparently feeds extensively on berries in autumn.
Breeding. No information.
Movements. Altitudinal and short-distance migrant; leaves breeding areas Oct, returns mainly late Mar to early Apr.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Qinghai Mountains EBA. Apparently rare; numbers presumably adversely affected by habitat loss in breeding range, but precise breeding range and habitat requirements require elucidation. Reportedly common in Koko Nor in early 20th century. Recorded from Helan Mountain and Yanchiwan Nature Reserves.
Bibliography. Cheng Tsohsin (1987, 2002), Étchécopar & Hüe (1983), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Neufeldt & Vietinghoff-Scheel (1983c), Stattersfield & Capper (2000), Vaurie (1972).

270. **Eversmann's Redstart**

Phoenicurus erythronotus

French: Rougequeue d'Eversmann **Spanish**: Colirrojo de Eversmann
German: Sprosserrotschwanz
Other common names: Rufous-backed/Red-backed Redstart

Taxonomy. *Sylvia Erythronota* Eversmann, 1841, Altai Mountains.
Has been considered possibly conspecific with *P. alaschanicus*. Monotypic.
Distribution. L Baikal area and N & W Mongolia S to E Kazakhstan, W China (N & W Xinjiang) and N Tadjikistan; non-breeding mainly N Indian Subcontinent.



Descriptive notes. 15 cm; 15–22 g. Breeding male has wing and tail like *P. alaschanicus*, but crown to nape pale grey, with black mask, chin to breast and flanks orange-rufous, white mid-belly to vent; bill and legs black. Non-breeding male has upperparts scaled whitish-buff. Female pale brown with two narrow buff wingbars, tail pattern as male. Juvenile paler than female, with darker scaling above and below, tail as adult. VOICE. Song, often from tree or bush, occasionally in flight or from rock, a lively unmusical mix of short, harsh, squeaky, buzzy, wheezy and often slurred notes on widely varying pitches; often given in rapid succession, and occasionally with mimicry. Apparent subsong by juvenile before completion of late-summer moult. Calls include low "drrr-drrr" or "krreck-krreck", croaking "gre-er", nasal rasping "chaaan" and loud "few-eet".
Habitat. Rocky scrub, fields with stone walls, edges and glades in sparse dry-ground coniferous woodland in mountains, openings and shrubbery inside forest, stunted trees and tree-line ecotone, to as high as 5400 m; in Kyrgyzstan favouring climatically rather wetter areas than *P. caeruleocephala*. In winter descends to below 2100 m in wetlands, *Acacia* and *Prosopis* groves and dunes, dry riverbeds, scrub jungle, juniper woodland, olive groves and orchards; in Pakistan in hilly tracts with scattered trees and bushes (*Acacia modesta* and *Olea cuspidata*), slopes and ravines with wild almond (*Prunus eburnia*) and stunted *Juniperus macropoda*, or willow and tamarisk bushes along river valleys.
Food and Feeding. Largely insects, especially adult and larval beetles and caterpillars, during summer, but few data. Outside breeding season, fruit and seeds playing a role, considerable in mid-winter. Stomachs from Kazakhstan, Oct–Mar, held dragonflies, grasshoppers, bugs, flies and fly larvae, ants, beetles from six families, spiders, myriapods, a bug, seeds, *Berberis* berries, seeds of "bryony", and seeds and stalks of *Rhamnus*. In Kyrgyzstan, some stomachs from Aug held berries of sea buckthorn (*Hippophae rhamnoides*) and legume seeds, others from winter held *Hippophae* and *Berberis* berries, dock seeds (Polygonaceae), rosehips (*Rosa*) and other plant material, and beetles. In Tadjikistan berries of *Eleagnus* may be crucial winter food until end Jan. *Vaccinium* also reportedly important component of diet, presumably in late summer to early winter. Stomachs from Uzbekistan, Nov–Dec and Mar, contained insects and spiders with very little plant material. Forages by typical perch-and-pounce method from low perch, and takes insects in aerial sallies; also moves about on ground or amid vegetation to glean invertebrates and pluck or pick up berries. Flicks tail, as well as shivering it.
Breeding. Jun–Jul in C Asia and S Siberia. Nest a cup of grass stems and moss on base of twigs, lined with wool and fur, placed on ground under roots or between rocks. Eggs 3–6, pale green with brownish-grey speckles. No other information.
Movements. Fully or partially migratory, with unpredictable nomadism in winter. In autumn migrates SW, either crossing or stopping in S Kazakhstan, Turkmenistan, Transcaspian region, Afghanistan and Iran, some reaching NW India and Nepal. Departure from Altai begins late Aug (females up to one month before males) with descent to lower-lying areas, but bulk of movement during Sept, and latest into late Oct; passage in S Kazakhstan early Oct to early Nov and again early Mar to mid-Apr. Passage migrant and winter visitor in Afghanistan mid-Oct to late Mar. Irregular in winter Arabian Gulf and Oman. Spring return to breeding areas can be as early as mid-Feb (males 1–2 weeks before females), generally late Mar (e.g. in Altai). Shifts wintering grounds from year to year and month to month, depending on climatic conditions.

On following pages: 271. Blue-capped Redstart (*Phoenicurus caeruleocephala*); 272. Black Redstart (*Phoenicurus ochruros*); 273. Common Redstart (*Phoenicurus phoenicurus*); 274. Hodgson's Redstart (*Phoenicurus hodgsoni*); 275. Blue-fronted Redstart (*Phoenicurus frontalis*); 276. White-throated Redstart (*Phoenicurus schisticeps*); 277. Daurian Redstart (*Phoenicurus auroreus*); 278. Moussier's Redstart (*Phoenicurus moussieri*); 279. Güldenstädt's Redstart (*Phoenicurus erythrogastrus*).

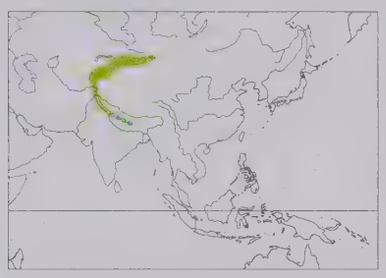
Status and Conservation. Not globally threatened. Generally fairly common in S Russia but locally abundant; judged rare in China. Locally frequent in winter in Pakistan.
Bibliography. Ali & Ripley (1987b), Arlettaz *et al.* (1992), Beaman & Madge (1998), Böhme & Böhme (1986), Cheng Tsohsin (1987), Cramp (1988), David & Gosselin (2002a), Dementiev *et al.* (1968), Flint *et al.* (1984), Gallagher & Woodcock (1980), Grimmett *et al.* (1998), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Mauersberger (1980), Meyer de Schauensee (1984), Neufeldt & Vietinghoff-Scheel (1983b), Nightingale & Hill (1993), Paludan (1959), Piechocki *et al.* (1982), Porter *et al.* (1996), Rasmussen & Anderton (2005), Roberts (1992), Whistler (1920), Zheng Guangmei & Zhang Cizu (2002).

271. Blue-capped Redstart

Phoenicurus caeruleocephala

French: Rougequeue à tête bleue **German**: Blaukopf-Rotschwanz **Spanish**: Colirrojo Capiazul
Other common names: Blue-headed Redstart/Robin

Taxonomy. *Phoenicura caeruleocephala* Vigors, 1831, Himalayas.
Lack of red in male plumage implies most distinctive of redstarts and possibly worthy of separate generic status; more research needed. Species name is noun phrase and thus invariable. Monotypic.
Distribution. Tien Shan S to E Afghanistan and through W & C Himalayas.



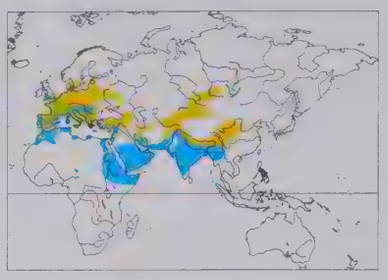
Descriptive notes. c. 15 cm; 13–17 g. Male has greyish-blue crown to nape, shading to black upperparts, with bold white band from shoulder to tertials; black continuing onto face and upper breast, sharply demarcated from white lower underparts; bill and legs black. Female is dull greyish-brown above, slightly paler below becoming whitish towards vent, has two narrow whitish wingbars, chestnut rump, blackish tail. Juvenile like female, but darker brown with buff scaling, whitish-edged tertials. Voice. Song, from lateral branch fairly high in tree, recalls that of Rock Bunting (*Emberiza cia*), a series of loud, fast, irregular, ringing, see-sawing jingles, "trrri-trrru-trrri-trrru-trrri-trrru-trruwhit-trruwhit", repeated with variations for minutes on end. Call a plaintive piping "eet" in alarm, also repeated "tk" clicks.
Habitat. Breeds in open, relatively dry forests generally with little undergrowth, mainly pine–cypress (*Pinus–Cupressus*) areas, upper edge of deodar (*Cedrus deodar*) forest, fir (*Abies*) with birch (*Betula*) and juniper (*Juniperus*), recent thickets, scrub on rocky hillsides; 2400–3900 m in Himalayas. Also in hazel scrub in Afghanistan, and in Kyrgyzstan favouring climatically drier areas than *P. erythronotus*. Winters in open valleys and hillsides, at 1200–3500 m. In China breeds at 2400–4300 m; winters in pine forest, scrub and olive groves at 1200–3000 m. Generally keeps to shaded lower storeys inside conifer forests, at least when co-occurring with *P. schisticeps*.
Food and Feeding. Insects in summer; also occasionally berries and seeds. Moths and caterpillars seen brought to young. Feeds in typical redstart sally-to-ground manoeuvre, occasionally also in aerial sally after flying prey; forages in canopy and on ground, but far more arboreal than most congeners. Shakes tail, rather than shivering it.
Breeding. May–Jun in Afghanistan and Tadjikistan; mid-May to end Jun/early Jul in Pakistan, May–Jul in Kashmir and Apr–Jul in Nepal; probably occasionally double-brooded. Nest a bulky broad-based shallow cup of coarse grass, bark, dry leaves and moss, lined with feathers and wool, placed on or near ground in rock fissure, among roots, in hollow under rotten log, in bank or in thick bush. Eggs 2–4, plain greyish-white to pale grey-green or dull creamy-buff with microscopic pale red freckling. No other information.
Movements. Altitudinal migrant to outer foothills of Himalayas, but part of population stays close to breeding grounds all year. Migrants may not become numerous until second half of winter, Jan–Mar, but winter displacements occur from Oct and may depend on severity of weather.
Status and Conservation. Not globally threatened. Fairly common in Afghanistan. Locally common in N Pakistan and E to N India; less common in Nepal. Uncommon in Tien Shan and Pamir–Alai.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Arlettaz *et al.* (1992), Bates & Lowther (1952), Cheng Tsohsin (1987), David & Gosselin (2002a), Dementiev *et al.* (1968), Flint *et al.* (1984), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Neufeldt & Vietinghoff-Scheel (1983d), Paludan (1959), Rasmussen & Anderton (2005), Roberts (1992).

272. Black Redstart

Phoenicurus ochruros

French: Rougequeue noir **German**: Hausrotschwanz **Spanish**: Colirrojo Tizón

Taxonomy. *Motacilla Ochruros* S. G. Gmelin, 1774, mountains of northern Gilan, Iran.
Has hybridized several times with *P. phoenicurus*. Proposed race *aterrimus* (Portugal, S & C Spain) merged with *gibraltariensis*. Races *phoenicuroides* and *rufiventris* intergrade; birds from W China (S Xinjiang) named as race *xerophilus* probably intermediate between them. Five subspecies recognized.
Subspecies and Distribution.
P. o. gibraltariensis (J. F. Gmelin, 1789) – Europe and NW Africa; non-breeding also N Africa and Middle East.
P. o. ochruros (S. G. Gmelin, 1774) – Asia Minor, Caucasus and NW Iran; non-breeding Middle East.
P. o. semirufus (Hemprich & Ehrenberg, 1833) – W Syria, Lebanon and NE Israel.
P. o. phoenicuroides (F. Moore, 1854) – S Russia (Tuva Republic) and W Mongolia S to Tien Shan, SE & S Kazakhstan and NW Pakistan; non-breeding NE Africa, Arabian Peninsula and SW & S Asia.
P. o. rufiventris (Vieillot, 1818) – Turkmenistan and Pamir–Alai Mts E through Himalayas to C China; non-breeding SW & S Asia.
Descriptive notes. 14–15 cm; 12–20 g. Male nominate race has slaty-grey crown to back, shading darker on wings, slaty-black face and underparts, with orange-rufous lower belly, rump and outer tail, central tail feathers slaty-black; bill and legs blackish. Female is mouse-grey, browner on cheeks and ear-coverts, darker on wings, underparts buffish to orange-buff on vent and undertail-coverts, tail as male. Juvenile is like female but darker above and below, with vague dark scaling from throat to belly; immature male can resemble adult female or, more rarely, adult male. Race *gibraltariensis* has white wing patch formed by whitish edges of secondaries, no rufous below, immature male sometimes like adult but without white in wing; *semirufus* is blacker on mantle and back and more extensively on breast, with clear-cut rufous belly (may show whitish edges of secondaries); *phoenicuroides* resembles previous, but rather small, forehead often white (phenotype can be approximated by hybrid between present species and *P. phoenicurus*); *rufiventris* is generally large, mostly black above, relatively deep



rufous below, female paler and browner than nominate, often fairly rufescent on belly. Voice. Song, by male (mainly spring, rarely in autumn and winter), a repeated phrase consisting of short wheezy jingling tremolo switching (after tiny pause) to short buzzy crackling and terminal whistle, "tuwíduwíwíwí, drrr-drrr-duwídu", variable geographically (and quality poorer in subadult-plumaged birds), and sometimes with mimicry; courtship song wheezier and harsher. Calls include sharp mousy "tsip", sometimes in rows, "tsip-tsip-tsip", used for all-year contact-alarm, harder "tk" or "tuc" in more aggressive territorial contexts, and combination of the two, "tsip-tk-tk", in high-intensity alarm; also various short whistles and churrs in courtship and fighting.
Habitat. Sparsely vegetated rocky areas, including stony slopes with xerophytic vegetation, crags and gulleys in high river valleys, rocky mountain tops up to snow-line; also villages, towns and cities, but tending to avoid areas with gardens and parks, instead selecting starker sites that more closely mimic rocky habitats, such as churches, large public buildings, industrial complexes, building sites, urban ruins, blocks of flats. In contrast to *P. phoenicurus*, greatly prefers perch (rock, rooftop, etc.) on which to stand, rather than one (branch, twig) to which to bind feet; in environment where both species occur, present species replaced by former when proportion of trees greater than 27%. In Carpathians chiefly on mountain slopes covered with juniper (*Juniperus*), scree and boulders. In European Alps population density increases with elevation, although infrequently higher than 2400 m. In Morocco breeds at 1800–3600 m, in Algeria at c. 1700 m, wintering from sea-level to 2500 m on rough hillsides with scattered vegetation, sea cliffs, open wooded plains, river valleys, field margins, towns, villages, ruins; in NE Africa *phoenicuroides* winters in same type of habitat above 1300 m, while in Arabia it uses palm groves and tamarisks bordering fields. In Afghanistan breeds at 2200–4000 m. In Himalayas breeds on relatively dry boulder-strewn steppe, open rocky valleys and valley bottoms, grassy slopes with rock debris, villages, at 3300–5200 m, wintering in open, scrubby or cultivated country, in stony groves, around villages, lowlands to foothills; in W Pakistan associated mainly with stunted *Juniperus macropoda* forest and in N found on rocky hillsides often near deodar (*Cedrus deodara*) groves, in *Pinus gerardiana* pines and in thickets of *Rosa webbiana*, *Berberis* and creeping juniper. In China in scrubland, meadows, farmlands and around buildings, above 3000 m.
Food and Feeding. Invertebrates and berries, switching proportions considerably. Invertebrates in diet include grasshoppers, earwigs, bugs, cockroaches, adult and larval lepidopterans, flies of at least six families, ants, bees and wasps, adult and larval beetles of at least twelve families, spiders, woodlice, millipedes, small molluscs and earthworms. Fruit (and seed) material includes juniper, docks and knotweed (Polygonaceae), cress (Cruciferae), strawberry (*Fragaria*), bramble (*Rubus*), hawthorn (*Crataegus*), cherry (*Prunus*), pea (Leguminosae), alder buckthorn (*Frangula*), dogwood (*Cornus*), elder (*Sambucus*), currant (*Ribes*), mulberry (*Morus*), olive (*Olea*), honeysuckle (*Lonicera*), ivy (*Hedera*), bilberry (*Vaccinium*); seen also to take *Aloe* nectar in winter. In summer in Kyrgyzstan, stomachs of 50 birds held bugs, ants and beetles. In summer in NW Spain, this species responsible for c. 30 % of *Prunus mahaleb* fruit consumption (604 of total of 1854 observations of birds feeding in 56 trees over four years); on average 14% of deliveries to nestlings comprised *P. mahaleb* fruits, with higher proportion in second half of nestling period than in first. Food presumed brought to nestlings in Britain comprised 33% flies (mostly midges), 17% seeds and fruits, 6% ants and 33% unknown. In winter in France, feeds widely on berries of China and Virginia creepers (*Ampelopsis* and *Parthenocissus*), consuming 50–100 berries daily in cold weather. In Oct–Feb, Spain, 32 gizzards held exclusively small and mid-sized (2–8 mm) arthropods, 37·5% worker ants, 17·3% winged ants, 31·7% beetles (mainly curculionid, carabid and staphylinid), 3·5% earwigs, 3·2% larvae and 6·8% others. In winter in Mallorca (Spain), small invertebrates greatly supplemented by berries of mastic tree (*Pistacia lentiscus*). In SE Spain with harsh winter conditions, diet highly variable individually, but always based on worker ants and soil weevils; scarcity and low quality of available prey may impose generalist foraging strategy and prevent individual specialization. In winter in Pakistan, insects, small crustaceans, spiders, while five stomachs from C India held many ants, hemipteran bugs, and adult and larval elaterid beetles. More terrestrial than *P. phoenicurus*, and feeds mainly on ground, sometimes digging 2–4 cm into earth to uncover larvae. Also sallies to ground to feed, and sometimes makes aerial flycatching sallies and briefly hovers to take prey from vegetation or vertical substrate. Quivers tail, but generally less frequently than *P. phoenicurus*.
Breeding. Mid-Apr to mid-Jul in W Europe, up to 2 weeks later in E Europe; late Apr to Jun in Morocco; Apr–Jul in Israel; May–Aug in India and Apr–Jul in Nepal; Jun–Jul in China; usually double-brooded, in C Europe up to 10% of pairs produce third brood. Co-operative behaviour noted in SW Sweden, where male-biased sex ratio. In Czech Republic, average territory size of adult males 1·21 ha and of subadult males 1·08 ha, being largest in "garden city" (1·98 ha), intermediate in old housing estate (1·48 ha) and smallest in new housing estate (0·85 ha); nest spacing often slight, average inter-nest distance in Israel 200 m, some as little as 50 m apart. Nest a loose cup of grass, moss, hair, wool and feathers, placed in crevice of wall or rock, or in earth bank, pile of stones or on ground. Eggs 4–6, white or rarely pale blue-green; incubation period 12–13 days; nestling period 12–17 days, but young often flightless for several days after leaving nest; post-fledging dependence as short as 11 days in some cases, but may last up to 4 weeks. Breeding success of yearlings (or when one of pair is yearling) only half of that of older birds; female-plumaged yearling males (45% of territorial males in population) often find territories in suboptimal sites with few (mostly also yearling) neighbours, and achieve lower success than do adult males and male-like yearlings (latter usually establish territories in zones preferred by adult males). One female laid 62 eggs over five years and fledged 49–51 young (7–14 per year). Causes of mortality among ringed birds in NW Europe are domestic predator 18%, human-related (accidental) 27%, human-related (deliberate) 23%, other 32%; in two Swiss villages, cat predation estimated as reducing productivity by 12%, and caused fatality in 33% eggs, 20% nestlings, at least 10% fledglings and at least 3% adults. Oldest recorded individual 8 years 5 months.
Movements. Resident, partial migrant, vertical migrant and full migrant in different parts of range. Breeding populations in Morocco, Iberia, SC France, Italy, Balkans and C Turkey generally sedentary, but mountain breeders may move to lower elevations in winter, and some spread more widely in Mediterranean Basin. In Europe, N populations migrate SW and reach or pass Balearic Is, E & S Spain (mid-Oct to mid-Nov) and Morocco and W Algeria (main arrivals end Oct to early Nov; higher proportion of first-years), while those breeding E of 13° E move SE and reach as far as Egypt, in both cases arriving Oct and departing Mar or early Apr; some reaching CN Africa presumably via Italy, with passage Malta mid-Oct to early Nov and Mar, and present Libyan coast Oct to mid-Apr; common in Cyprus late Oct to Feb, in Jordan early Nov to early Mar, very common migrant and winter visitor in Israel Nov–Mar, and common in UAE end Oct to early Mar. Return to breeding grounds in Germany and Ukraine from as early as Mar, extending into Apr. Nominate race moves E to Zagros Mts (Iran) and SE to adjacent Iraq end Sept to end Mar. Race *phoenicuroides* leaves Altai late Aug to early Sept, and SE Kazakhstan in late Oct, wintering NE Africa and E to C India; arrival Africa in late Oct

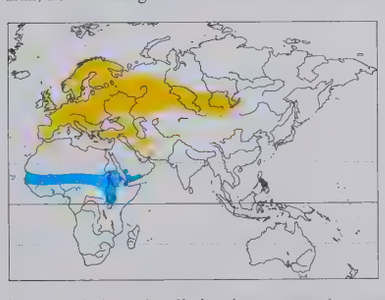
to Nov, and present Somalia Oct–Mar; passage in Bahrain Oct (winterers arriving Nov–Dec) and late Feb to early May (mainly Mar); first arrivals back in Kazakhstan end Mar, in S Altai early Apr and N Altai end Apr. Race *semirufus* arrives NE Israel Mar; departs Oct–Nov and probably spreads farther E, S & W, but reports conflicting. Race *rufiventris* descends from mountains to plains in Pakistan late Sept to early Apr, mainly Oct–Mar; recorded on spring passage in NE Myanmar in first week of Apr, and gone from country by end of that month; vagrant, probably of this race, recorded in Thailand.
Status and Conservation. Not globally threatened. European population in mid-1990s estimated at 3,647,070–6,161,507 pairs (by far the greatest numbers in Germany), with additional 50,000–500,000 pairs in Turkey but only 1000–10,000 pairs in Russia; at that time Spain estimated to hold 400,000–900,000 pairs. By 2000 total European population (including European Russia and Turkey) revised to 4,000,000–8,800,000 pairs, and considered generally stable. Optimal densities c. 40 pairs/km² (0·4 pairs/ha), but 0·8–1·5 pairs/ha found in alpine zone in Switzerland (including three pairs in one barn), and remarkable values of 2–3 pairs/ha reported in Georgia. Since 1850s breeding range has expanded across NW Europe, reaching Danish islands in 1890, Sweden in 1910, UK in 1940 and Norway in 1944, but these peripheral populations have lower breeding success and may not be self-sustaining (studies in SW Sweden reveal low male site-fidelity, and floating population estimated at 26%). Uncommon local breeder in mountains in Morocco and Algeria. Population of race *semirufus* in Israel c. 100 pairs in 1980s. Widespread and often common in Turkey; common in Armenia; often abundant in Afghanistan. Common breeder in N Pakistan and locally common in Himalayas.
Bibliography. Adamian & Klem (1997, 1999), Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Andersson, R. (1995, 1996, 2001), Andrews (1995), Anon. (2004e), Ash (1980), Austin (1948), Bates, G.L. (1936), Bates, R.S.P. & Lowther (1952), Baumgart *et al.* (1995), Beaman & Madge (1998), Becker (1984), Berthold (1983, 1985), Blattner (1989), Blattner & Kestenholz (1993), Borrow & Demey (2001), Bozic (2001), Bueno (1992b), Bundy (1976), Cano (2003), Chadwell *et al.* (1982), Cheesman & Sclater (1935), Cheng Tsohsin (1987), Cramp (1988), Crocq (2002), Cucco & Malacarne (1997, 1999), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dharmakumarsinhji (1955), Érard & Yeatman (1967), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Gaston (1970), Glutz von Blotzheim & Bauer (1988), Grant & Mackworth-Praed (1940b), Grimmett *et al.* (1998), Grosch (2004), Guitian *et al.* (2001), Hagemeijer & Blair (1997), Heer (1999a), Hegelbach & Nabulon (1998), Henze (1958), Herrera (1978a), Hirschfeld (1995), Hódar (1998b), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Isenmann & Moali (2000), Kasparek (1992), Keith *et al.* (1992), Kneis & Spretke (1985), Kollinsky & Landmann (1996), Lambert (1997), Landmann & Kollinsky (1995a, 1995b), Ledant *et al.* (1981), Lee Woo-Shin *et al.* (2000), Leer (1999), MacKinnon & Phillipps (2000), Martens & Eck (1995), Mauersberger (1980), Menzel (1983), Meyer de Schauensee (1984), Musseau (2002), Nesenhöner (1956), Nicolai (1990, 1998, 2001), Nicolai & Krone (2003), Nicolai *et al.* (1996), Nightingale & Hill (1993), Nikolaus (1987), Nilsson (1999), Paludan (1959), Paz (1987), Piechocki *et al.* (1982), Porter *et al.* (1996), Rasmussen & Anderton (2005), Rékási (1991), Richardson (1990), Roberts (1992), Robson (2000), Roselaar (1995), Round *et al.* (2002), Sackl & Rauer (1987), Schmidt (1992), Schwarzová & Exnerová (2004), Sedlácek *et al.* (2004), Senk (1962), Shirihai (1996), Short & Horne (1981), Silsby (1980), Sinclair & Ryan (2003), Smythies (1986), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Tomek (2002), Vaurie (1955b, 1972), Verbeek (1984), Walker, D. (2002), Weggler (2000, 2001), Weggler & Leu (2001), Welch & Welch (1984), Wozniak (1997), Zamora (1992), Zheng Guangmei & Zhang Cizu (2002), Zink (1981).

273. Common Redstart

Phoenicurus phoenicurus

French: Rougequeue à front blanc **German**: Gartenrotschwanz **Spanish**: Colirrojo Real
Other common names: White-fronted Redstart

Taxonomy. *Motacilla Phoenicurus* Linnaeus, 1758, Sweden.
Has hybridized several times with *P. ochruros*. Two subspecies recognized.
Subspecies and Distribution.
P. p. phoenicurus (Linnaeus, 1758) – Europe (except SE) and NW Africa E to C Siberia and N Mongolia; non-breeding Africa.
P. p. samamisicus (Hablizl, 1783) – S Balkans and Greece E to Turkmenistan, S Uzbekistan and Iran; non-breeding NE Africa and Arabian Peninsula.



Descriptive notes. 14 cm; 11–23 g. Male nominate race is bluish-grey from mid-crown to back and wings, with black face and throat, white band above forehead extending as short supercilium; orange-rufous rump and outer tail, blackish central tail feathers; orange-rufous breast and flanks, shading to buffier belly; bill and legs blackish. Female is plain mid-brown above, with narrow whitish eyering, orange-tinged buffy-white below; tail as male. Juvenile is brown with buff spotting above and below, tail like adult. Race *samamisicus* has white wingpanel formed by white edges of secondaries and tertials. Voice. Song, by male on breeding grounds (occasionally in winter quarters), commonly from within foliage but often from low bare perch, and richest in period of resurgence during incubation, a sweet melancholy series of short two-part phrases, the first part with pure whistled notes, the second with complex mix of squeaky, hard and buzzy sounds, sometimes with mimicry (apparently depending on singer; but average number of species imitated in one French study 15), ending in flourish, "sih trúí-trúí-trúí sisi-tri-sivííú-tri"; maximum rate nine phrases per minute (usually seven), but occasionally phrases run into single continuous song. Songs occasionally simply snatches of mimicry, and sometimes becoming subsong audible at only 10–15 m (also performed, rarely, by female). When challenging intruding conspecific male, uses a harsh warble recalling song of Common Whitethroat (*Sylvia communis*); after copulating, male may sing sweet extended song in flight. Calls include liquid "twick" or "hwii-tik-tik", plaintive "hwiiit" like that of a *Phylloscopus* warbler, also sharp scolding "tchak" recalling Blackcap (*S. atricapilla*).
Habitat. Open forest and woodland, including old parkland and park-like gardens, forest clearings and margins, preferably with semi-open undergrowth or herbage, in N Europe subarctic mountain birch and barren pine forests and in C & S Europe broadleaf forest, but many intermediate habitats such as heaths and commons with scattered mature trees, pollard willows (*Salix*) along streams and ditches, open hilly country with old stone walls and buildings. In Russia generally prefers broadleaf and mixed forest, less often pinewoods. In N Africa breeds in old oak (*Quercus*) and/or conifer (fir and cedar) forest at 1500–2200 m. Throughout range thinned oak woodland greatly favoured, but thinned woodland much less attractive after five years' regrowth. Old gardens, parks and cemeteries mimic thinned woodland, and in suburban Berlin (Germany) breeding densities up to 14 times that in closed forest. Usually winters mainly in semi-arid thorn steppe, thickets, dry open woodland, riverine acacia and gardens, to 2000 m. In winter in Sahel, commonest in areas with high overall tree density; in N Ethiopia woodland above 600 m, with nominate usually at higher elevations than *samamisicus*. Often in more scrubby areas on passage. In Saudi Arabia, passage and winter, in palm groves and tamarisks.
Food and Feeding. Invertebrates and berries. Animal food includes adult and larval beetles of at least 13 families, adult flies of at least ten families, adult and larval hymenopterans (ants, bees, wasps, sawflies and ichneumons), adult and larval lepidopterans of at least ten families, adult orthopterans of at least four families, hemipteran bugs of at least five families, earwigs, caddis flies, mayflies, damselflies, spiders, harvestmen, mites, woodlice, millipedes, molluscs and earthworms. Plant food includes berries and fruits of juniper (*Juniperus*), yew (*Taxus*), rowan (*Sorbus*), bramble (*Rubus*), currant (*Ribes*), crowberry (*Empetrum*), elder (*Sambucus*), buckthorn (*Rhamnus*), alder buckthorn (*Frangula*), dogwood (*Cornus*), privet (*Ligustrum*), strawberry-tree (*Arbutus*), juneberry (*Amelanchier*), cherry (*Prunus*) and pear (*Pyrus*). In summer, E Germany, 52% by number of 601 items in adult diet were hymenopterans, 23% beetles, 7% bugs, 7% flies and 11% others; stomachs of 16 spring and autumn birds, Crimea, held 44% hymenopterans (mostly ants), 38% beetles, 8% bugs and 10% others. In study in Moldova, plant material only 7·4% of total food intake and appeared in diet only Jul–Sept/Oct, and seen to feed on berries of *Salvadora persica* prior to N migration in Mar (berries may be used to build pre-migratory fat reserves). Food brought to nestlings, Italy, 38% coleopterans, 31% dipterans, 26% lepidopterans, 2% spiders and 2% crustacea; in Germany, 27% adult and larval lepidopterans, 22% spiders (falling as young grew), 20% beetles (rising as young grew), 11% hymenopterans, 8% flies, 6% grasshoppers and 6% others in one study, in another study 20% beetles, 19% lepidopterans, 18% spiders, 17% flies, 11% bugs, 7% hymenopterans and 8% others, and in a third study 59% lepidopterans, 12% beetles, 8% spiders, 6% flies and 15% others. Forages from bushes or lower branches of trees, flying out to catch prey on ground, usually returning to eat it; makes short sallies after flying insects, and flies or flutters to pick items from trunks, branches and leaves, sometimes hovering briefly. In boreal birch forest in summer, foraging divided fairly equally (25–30% each) among flights to ground, gleaning in tree foliage and aerial sallying, with 12% in herb layer and 8% from trunks and branches; male tends to make aerial sallies more than does female, which tends to do more foliage-gleaning than male. Shivers tail following body movement.
Breeding. End Apr to mid-Jul in W Europe, up to 2 weeks earlier in S Europe; late May to late Jun in N Finland; May–Jul in Morocco; usually double-brooded in S Europe. Occasional cases of male with two females. Territory size in generally good habitat in Europe 0·1–1 ha. Nest a cup of grass, roots and moss, lined with hair and feathers, usually placed 1–6 m up in hole in tree, wall or old stump, or nestbox (very occasionally in more open situation), commonly with one side with open terrain, often facing S or SE. Eggs 5–7 (increasing with latitude but declining through season, and older birds laying more eggs than younger), plain pale blue to greenish-blue, occasionally with fine dark reddish speckling; incubation period 12–14 days; nestling period 12–15 days; post-fledging dependence 10–14 days. Brood parasitism by Common Cuckoo (*Cuculus canorus*) fairly common (20% in one area of Finland). Of 479 eggs in 76 nests in Finland, 81% hatched and 92% of hatchlings fledged, giving 75% overall success, with mean 4·7 young fledged per nest; in another study in extreme N Finland (in a "marginal" breeding area), hatching success and fledging success were, respectively, 0·91 and 0·89, and only heavy rainfall decreased nestling survival. Nest loss to Eurasian Wryneck (*Jynx torquilla*) and Common Starling (*Sturnus vulgaris*) sometimes frequent. Annual first-year mortality 79%, annual adult mortality 62%, annual overall mortality (Finland) 51%. Causes of mortality among ringed birds in NW Europe are domestic predator 18%, human-related (accidental) 24%, human-related (deliberate) 49%, other 9%. Age of first breeding variable, in one study 59% of individuals (75% males, 42% females) bred at 1 year. Oldest recorded individual 9 years 6 months.
Movements. Migratory. In autumn, populations from W, C & N Europe move through Iberia over extended period from mid-Aug to early Nov and W Mediterranean and enter NW Africa, some remaining N of Sahara (regular Jan–Feb N Morocco and N Algeria, rarely E to Egypt); E populations move through E Mediterranean, very common autumn passage migrant in Israel, mainly mid-Aug to mid-Nov, common in Jordan mid-Sept to mid-Nov, but relatively weak passage in Bahrain Sept–Nov. Great majority cross Sahara on broad front to winter in savanna belt (S of Sahel) E to Ethiopia and L Victoria. Main autumn passage in Algeria mid-Sept to mid-Oct. Senegal from mid-Sept, Chad and N Sudan late Sept to Oct, arriving in winter quarters Oct and Nov; vagrants in Seychelles occur Oct–Nov. Individuals of nominate birds wintering in NE Africa are probably all from Russia. Spring departure from Mar to early Apr, with strong passage N Africa and Jordan mid-Mar to mid-May, males somewhat earlier than females, and greater numbers using more E routes involving Tunisia and Libya; in Israel main passage Mar–Apr, strong passage in UAE mid-Mar to early May; protracted passage Mar–Jun, with peak late Apr/early May, in E Saudi Arabia. Spring migrants appear in Spain from late Mar. Race *samamisicus* winters in Arabia and NE Africa, showing same migratory schedule as nominate except that autumn passage in N Sudan rather earlier, in Sept, and return through Jordan late Feb to early Mar and Bahrain late Feb to early Apr (nominate race rather later in Bahrain, to early May); light passage through Cyprus, mainly late Mar to early Apr.
Status and Conservation. Not globally threatened. In mid-1990s, European population estimated at 1,962,293–3,369,902 pairs (most in Finland, France, Germany and Romania), while 100,000–1,000,000 pairs in Russia and 10,000–100,000 pairs in Turkey; at that time Spain estimated to hold 75,000–94,000 pairs, and species listed there as nationally "Vulnerable" following steady declines attributed to events in winter quarters. By 2000 total European population (including European Russia and Turkey) revised to 6,800,000–16,000,000 pairs, and considered generally stable. Uncommon local breeder in N Morocco and N Algeria, apparently extinct Tunisia. In oakwoods in Wales 67 territories/km², in broadleaf woodland in S & N England 58 and 26 territories/km² respectively, and in mixed oak–hazel and oak–birch coppice in W Scotland 49 pairs/km²; but as many as 266 pairs/km² at one site in E Germany, and up to 120 pairs/km² in parks and gardens in Switzerland. Marked decline in N half of Europe since 1960s, particularly severe in C Europe since 1968, attributed to rainfall patterns in Sahel combined with intensified modern forestry practices (reducing availability of nest holes) and interspecific nest-site competition, but evidence weak; partial recovery in Britain not explicable by changes in these factors. Ringing data show high proportion of deliberate killing of birds from NW Europe, suggesting considerable pressure.
Bibliography. Adamian & Klem (1997, 1999), Ali & Ripley (1987b), Andrews (1995), Anon. (2004e), Ash (1980), Bannerman (1953), Barlow *et al.* (1997), Bates (1934, 1936), Baumgart *et al.* (1995), Beaman & Madge (1998), Berthold (1985), Blattner & Kestenholz (1993), Borrow & Demey (2001), Bösenberg (1960), Boubier (1925), Britton (1980), Bruch *et al.* (1978), Bueno (1992a), Bundy (1976), Bundy *et al.* (1989), Buxton (1950), Caldonazzi *et al.* (2001), Cave & MacDonald (1955), Chapin (1953), Cheke & Walsh (1996), Comolet-Tirman (1994), Cramp (1988), Curry & Sayer (1979), Dementiev *et al.* (1968), Diesselhorst (1968), Dornbusch (1981), Dowsett & Fry (1971), Duckworth (1994), Eeva *et al.* (2000), Elgood *et al.* (1994), Emmrich (1975), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Gatter (1997), Glutz von Blotzheim & Bauer (1988), Gore (1990), Grimes (1987), Grimmett *et al.* (1998), Grosch (2004), Guichard (1955, 1957), Hagemeijer & Blair (1997), Hamidi & Bouariche (1998), Hegelbach (1998), Hegelbach & Nabulon (1998), Hirschfeld (1995), Hogstad (1977), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Huhta & Jokimaki (2001), Isenmann & Moali (2000), Järvinen (1982, 1986, 1989, 1993), Jensen & Kirkeby (1980), Jones *et al.* (1996), Jonkers & Marechal (1990), Kasparek (1992), Keith *et al.* (1992), Ledant *et al.* (1981), Lewis & Pomeroy (1989), Lippens & Wille (1976), Lovaty (2004), MacKinnon & Phillipps (2000), Marchetti *et al.* (1998), Mauersberger (1980), Menzel (1971), Moreau (1961), Moreau & Dolp (1970), Moreau & Moreau (1928), Morel & Morel (1990), Mouritsen (1998), Nightingale & Hill (1993), Nikolaus (1987), Paz (1987), Piechocki *et al.* (1982), Porter *et al.* (1996), Prieta (2003), Pulliainen *et al.* (1994), Rasmussen & Anderton (2005), Richardson (1990), Riddington (2002), Roberts (1992), Roselaar (1995), Ruiter (1941), Rutila *et al.* (2002), Sedlácek *et al.* (2004), Shirihai (1996), Silsby (1980), Sinclair & Ryan (2003), Skerrett *et al.* (2001), Smith, K.D. (1960), Smith,

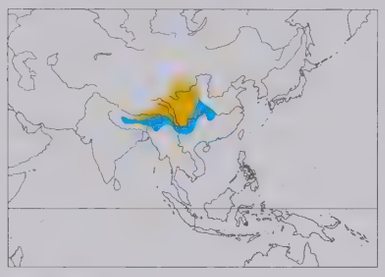
V.W. (1966), Stoate & Moreby (1995), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Tomialojc (1984b), Vaurie (1955b), Welch & Welch (1984), Wozniak (1997), Zink (1981).

274. Hodgson's Redstart

Phoenicurus hodgsoni

French: Rougequeue de Hodgson **German**: Feldrotschwanz **Spanish**: Colirrojo de Hodgson

Taxonomy. *Ruticilla Hodgsoni* F. Moore, 1854, Bhutan.
Monotypic.
Distribution. NE, E & SE Tibetan Plateau E to C China; non-breeding Nepal E to S China and Myanmar.



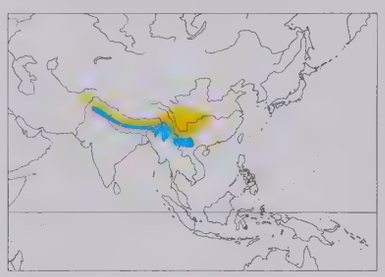
Descriptive notes. 15 cm; 14–19 g. Very like *P. phoenicurus*, but slightly larger. Male differs in having narrower white frontal band, more extensive and slightly bluish (less glossy black) bib extending to upper breast, more uniform and extensive rufous-orange on belly to vent, white wingpanel on secondaries (also present on race *samamisicus* of *P. phoenicurus*); female by lower back contrasting more with rump, darker and duller below. Juvenile is like female but slightly darker and mottled below. Voice. Song a series of short, sprightly, variable phrases each consisting of tinny, tinkly, well-separated notes and interspersed dry buzzy trills. Call a single clicking "prit"; in alarm a rattling "trrr, tschrrr".
Habitat. Breeds in varied montane landscapes such as part-wooded hills, poplar-studded and pine-studded slopes, grassy bush-dotted plateaux, and scrub, grass and meadows inside mixed forest tracts in mountains, and upland valleys, often near streams and rivers, sometimes near stone houses (but avoiding steep rocky areas); at 2400–3600 m, locally to 4300 m. In winter, found in partly dry riverbeds, open scrub jungle and edges of cultivation, lowlands to 2800 m.
Food and Feeding. Insects, berries. Forages in short flights from perch; also sallies for flying insects.
Breeding. May–Jul. Nest reportedly made of grass stems and twigs, lined with feathers, placed in hole amid pine roots, in rotten stump, in crevice in rock, wall or riverbank, under rocks on hillside or under roof of hut. Eggs 4–5, pale blue to greenish-blue, plain or faintly speckled. No other information.
Movements. Migratory. Arrives on breeding grounds end Mar in Tibet, mid-Apr in China. Winter visitor to Himalayas, main arrival mid-Oct, records in Nepal late Sept to mid-May; a few reach N Myanmar.
Status and Conservation. Not globally threatened. Fairly common in much of breeding range. In winter, locally common in India, fairly common in China and and scarce in N Myanmar.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Schäfer (1938), Smythies (1986), Vaurie (1972), Vietinghoff-Scheel (1980a), Zheng Guangmei & Zhang Cizu (2002).

275. Blue-fronted Redstart

Phoenicurus frontalis

French: Rougequeue à front bleu **German**: Himalajarotschwanz **Spanish**: Colirrojo Frentiazul
Other common names: Blue-breasted Redstart

Taxonomy. *Phoenicura frontalis* Vigors, 1832, Garhwal, Himalayas.
Has been considered closest member of present genus to *Rhyacornis* on account of tail-flirting behaviour. Birds from China reportedly paler, and sometimes separated as a geographical race, *sinae*. Monotypic.
Distribution. E Afghanistan and Himalayas E to S China, probably including N Myanmar; non-breeding N India E to N Indochina.



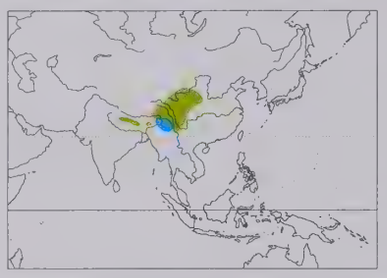
Descriptive notes. 15–16 cm; 12–19 g. The only redstart with inverted-T pattern on tail. Breeding male has blue head, back, wings and throat; rest of underparts, rump and relatively long tail rufous-orange, tail with black central feathers and distal third; bill and legs black. Non-breeding male is heavily scaled buff above. Female is dull greyish-brown, tail as male. Juvenile is dark brown with buff spotting, buffy on belly, tail as male. Voice. Song, sometimes in low display-flight, a series of phrases consisting of the same basic but subtly varied arrangement, 1–2 harsh grating trills followed by short sweet warble, recalling less wheezy *P. ochruros*. Calls include repeated low thin, grating "ee-tit-tit" stutter in alarm, mournful "swee-up" in alarm near nest, and single clicking "tik".
Habitat. Breeds in subalpine dwarf juniper, rhododendron, birch scrub and open grassy areas in alpine zone above tree-line, at 3000–5200 m, although found in Afghanistan in valley-bottom hazel scrub at 2200 m. Winters in understorey of open forest, bushy river valleys (e.g. with *Homonoia* and *Salix*), gorges, and in open terrain with bushes, cultivated clearings, tea gardens, terraces, pastures, scrub, thickets, etc., at 1000–2700 m; above 1400 m in N Thailand.
Food and Feeding. Insects, berries, seeds. Insects predominate May–Sept, but from Aug berries and seeds also taken; in winter exclusively vegetable material, e.g. *Viburnum* berries and *Photinia* seeds. Caterpillars seen brought to nestlings. Forages by making short flights from perch; also occasionally hawks flying insects. Tail wagged up and down more than quivered.
Breeding. Mid-May to Aug in Himalayas and May–Jul in China. Nest a cup of dry moss bedded on coarse grass, lined with hair, feathers or thin roots, placed in tree hole, stump, wall crevice, end of fallen tree, crack in rock face, among rocks or under dense vegetation. Eggs 3–6, pale green to pale greyish-pink, buffish or whitish with dense pale reddish spotting. Parasitized by Common Cuckoo (*Cuculus canorus*). No other information.
Movements. Altitudinal migrant and (probably partial) short-distance migrant, but vertical movements may be only slight; still travelling upslope to breeding grounds mid-May.
Status and Conservation. Not globally threatened. Presumably scarce breeder in Afghanistan (Nuristan). Common in Himalayas; fairly common in China. Presumed to breed in N Myanmar. In non-breeding season common in Bhutan; generally scarce in N parts of SE Asia, but a common roadside bird in Myanmar; rare in Thailand.
Bibliography. Ali (1977), Ali & Ripley (1987b), Bates & Lowther (1952), Birckhead (1937), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Landmann & Winding (1993), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Paludan (1959), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Vaurie (1955b, 1972), Vietinghoff-Scheel (1982a), Zheng Guangmei & Zhang Cizu (2002).

276. White-throated Redstart

Phoenicurus schisticeps

French: Rougequeue à gorge blanche **Spanish**: Colirrojo Gorgiblanco
German: Weißkehl-Rotschwanz

Taxonomy. *Ruticilla schisticeps* J. E. Gray & G. R. Gray, 1847, Nepal.
Monotypic.
Distribution. C & E Himalayas E from Nepal, and C China (Qinghai S SE Xizang and N Yunnan).



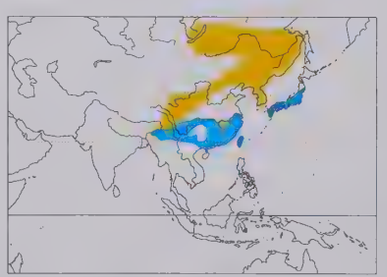
Descriptive notes. 15 cm; 15–17 g. Male has slaty-blue crown, black face to back and wings, rufous rump, long white band from wing-coverts to secondaries, rufous patch on lower scapulars, blackish tail; small white triangle on throat, rufous-orange breast to vent, white on lower belly; in fresh plumage scaled buff on upper body; bill and legs dark. Female is mid-brown above, buff-brown below, with similar white areas to male's but generally less white on throat, rufous rump, blackish tail. Juvenile is like female but dark, heavily spotted buff, with weak throat patch and wingband. Voice. Song a quiet series of short, dry, trilled phrases, each containing 2–3 consecutive note types and each starting hesitantly with several high short strokes, usually accelerating towards end. Call a high dry rattle, sometimes preceded by drawn-out "zieh".
Habitat. Breeds in subalpine habitats, often near streams, below tree-line in open dry rainshadow areas with park-like forest of scrub oak and dwarf juniper, and regenerating burnt areas; commonly in pine–cypress (*Pinus–Cupressus*) forest, fir (*Picea*) with birch (*Betula*) and rhododendron, dry bushy areas with *Caragana*, *Lonicera*, *Berberis* and *Rosa*, at 2700–4500 m (from 2400 m in China). Winters in similar habitats but also in leafless birch tracts, open meadows, stony scrub-covered hillsides, dry watercourses and village environs, at 1400–4200 m.
Food and Feeding. Insects mainly in summer; also berries and seeds, in winter particularly of *Hippophae* and *Juniperus*. Makes short flights from perch.
Breeding. Mid-May to Aug in Tibet; juveniles Jun–Jul in Nepal. Nest a cup of moss, grass, small dry twigs, leaves and bast, lined with soft grass, fibres, rootlets, feathers, hair and/or wool, placed in hole in tree, bank or rock within 2 m of ground. Eggs 3–4, plain reddish-cream to pale greenish-grey, sometimes with fine faint orange-clay speckles. No other information.
Movements. Partially sedentary, some males merely moving to adjacent valleys, but some slight vertical and local movements. Movement from mid-Oct, but many still at high elevations in Tibet mid-Nov; return early Mar; returning migrants seen mid-Feb to Apr in China.
Status and Conservation. Not globally threatened. Common in Tibet and China; scarce in Himalayas. Status in N Myanmar uncertain; presumed scarce non-breeding visitor.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Deignan (1945), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Schäfer (1938), Smythies (1986), Vaurie (1972), Vietinghoff-Scheel (1982b), Zheng Guangmei & Zhang Cizu (2002).

277. Daurian Redstart

Phoenicurus auroreus

French: Rougequeue aurore **German**: Spiegelrotschwanz **Spanish**: Colirrojo Dáurico

Taxonomy. *Motacilla aurorea* Pallas, 1776, Selenga River, south Russia.
Two subspecies recognized.
Subspecies and Distribution.
P. a. auroreus (Pallas, 1776) – SC Siberia and Mongolia E to Amurland, S to Korea and NE China (S to Hebei); non-breeding Japan, Taiwan and SE China.
P. a. leucopterus Blyth, 1843 – NE India and C & E China; non-breeding E Himalayas E to N Indochina.



Descriptive notes. 15 cm; 11–20 g. Male nominate race has grey crown to nape, palest in superciliary area, bordering black face and throat, black mantle, back and scapulars, blackish wings with compact bold white patch on mid-wing, orange-rufous rump and outer tail, blackish central tail and orange-rufous underparts; in fresh plumage has mantle scaled paler; bill and legs blackish. Female is mid-brown above, pale brown below, with white wing patch and tail pattern as male. Juvenile is dark brown with buff mottling above, buff with brown mottling below, with narrow rufous rump, black tail, white wing markings as adult. Race *leucopterus* male has larger, glossier black gorget, darker grey crown, deeper rufous underparts, female more olivaceous above, slightly darker below. Voice. Song a variable series of short, sweet, mostly descending phrases typically starting with 1–2 short clear notes followed by scratchy trill and wheezy jingling flourish with some clear slurred notes. Calls include high-pitched sharp "tsip" or "fit", "teck teck" in alarm (combining as "fit wheet"), and rapid rattling "tititit"; first of these may be used as song ("siup siup siup"), by either sex from high perch in winter quarters as territorial warning.
Habitat. Sparse subalpine woods and forest, riverside thickets, secondary jungle, scrub, clearings, tea gardens, open country near human settlements, gardens and parks, in summer at 2800–3700 m.

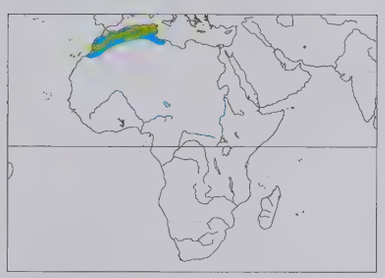
In Mongolia found in willow-studded upland moorland and near steep cliffs and streams; penetrates large cities in Korean Peninsula. In winter, occurs along roadsides and in *Homonoia* and *Salix* riverbed scrub, bracken-clad hillsides and open hilly country, sea-level to 2000 m, in Myanmar; in Thailand in understorey of open forest, secondary growth and scrub, from 300 m to summits; in China and Taiwan in hilly, part-wooded/part-cultivated country, commonly on telephone lines by roads, gardens, grassy areas with scattered bushes, groves with thick bramble undergrowth; in Japan also in wooded parks and gardens. Some evidence of territorialism in winter.
Food and Feeding. Insects, berries, seeds; in one study in China, five birds had eaten 68% insects (including grasshoppers, ants, flies, bugs and weevils) and 32% grass seeds; in another study in China, 66 individuals had eaten 77·5% insects, 22·5% plant material. Makes short flights from perch and short aerial sallies.
Breeding. Apr–Jun in S Siberia, and May–Aug in Mongolia and Tibet. Nest a cup made of straw, bark, moss and rootlets, lined with fine grass, hair and feathers, placed in hole in ground, tree, rock, wall, bank or cliff, on rafter of old building or in building site, generally below 1·5 m. Eggs 3–6, pinkish, whitish, pale greenish to pale blue with pale warm brown spots and speckles; in captivity, incubation period 16–18 days, nestling period 13–14 days.
Movements. Migratory. Populations in SE Russia and NE China move down E Asian coast to S China, but some also winter in Korean Peninsula, where found in Seoul Oct to early Apr; autumn departure Russia from end Sept into first half Oct; passage in Mongolia noted Sept and main autumn passage at Beidaihe (NE China) late Sept to mid-Nov, spending winter in Fujian from mid-Oct to late Mar and around Hong Kong mainly mid-Nov to mid-Mar. Arrives late Oct in C & S Japan, most abundant there early Nov to late Jan, departs late Mar to early Apr. Arrives Myanmar Nov; scarce to fairly common non-breeding visitor in NW Thailand and N Indochina. Vagrant in Philippines (nominate race).
Status and Conservation. Not globally threatened. Common in most of breeding range; rare on N edges, but abundant in SW Transbaikalia. In Korean Peninsula common breeding, passage and wintering species. Status in Myanmar uncertain; fairly common in winter, possibly resident.
Bibliography. Ali (1977), Ali & Ripley (1987b), Anon. (2000a), Austin (1948), Austin & Kuroda (1953), Bergmann (2004), Birckhead (1937), Brazil (1991), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1964, 1987), Collar *et al.* (2003), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Duckworth, Davidson & Timmins (1999), Flint *et al.* (1984), Gore & Won Pyongoh (1971), Grimmett *et al.* (1998), Herklots (1967), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Mauersberger (1980), Meyer de Schauensee (1984), Neufeldt & Vietinghoff-Scheel (1983a), Piechocki *et al.* (1982), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Sowerby (1943), Tomek (2002), Vaurie (1955b, 1972), Williams (2000).

278. **Moussier's Redstart**

Phoenicurus moussieri

French: Rougequeue de Moussier **German**: Diademrotschwanz **Spanish**: Colirrojo Diademado
Other common names : Coroneted Redstart

Taxonomy. *Erythacus Moussieri* Olphe-Galliard, 1852, Oran Province, Algeria.
Monotypic.
Distribution. Morocco E to Tunisia.



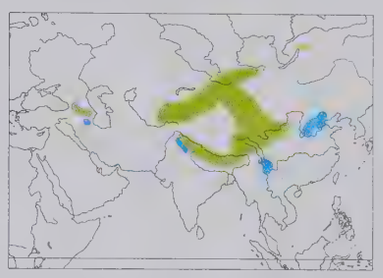
Descriptive notes. 12 cm; 14–15 g. Male has long white band from forehead along supercilium and around rear ear-coverts, blackish from head below eye to back and wings, white wing flash, rusty-orange rump and tail, latter with dark central feathers, rusty-orange underparts; in fresh plumage scaled buff above and below; bill and legs black. Female is brown above, orange-buff below, tail as male; like female *P. phoenicurus* but more heavily orange-tinged below, faint buff-white wing flash. Juvenile is like female, underparts mottled or scaled dark on buff from throat to breast, more weakly on belly, but juvenile male has black wings with white patch. Voice. Song a series of phrases, each a short scratchy warble consisting of thin reedy buzzing notes repeated up to ten times, e.g. "zírezrize zerízerízer zerezerizera"; subsong a soft rapid jumble of low whistles, chirrups and chuckles. Calls include high "iiip iiip" often followed by rasping "tr-rr-rr", for contact and mild alarm, the two combined in alarm near nest, "pi-chirrr"; also "psew".
Habitat. Open rugged hilly country and stony plateaux with xerophytic steppe scrub, scree, dry areas with xerophytic bushes and scattered trees (*Juniperus*, *Tetraclinis*, *Quercus*), upland rocky meadows, open scrub woodland of holm oak, and clearings and edges of Atlas cedar (*Cedrus*) forest, mainly at 500–3200 m; also in low-lying areas in SW Morocco, reaching coastal districts, in argan bush, orchards and cultivated valleys. In E of range inhabits dry grassy, stony or rocky slopes with scrub and low bushes, and degraded wooded land with scattered large trees (pine, oak and cedar), mainly 1500–2300 m. In winter in lower, flatter, more desert country, including scrub and bushes near water (wadis, oases) and in *Ziziphus* scrub on plains.
Food and Feeding. Insects, mainly ants (one seen feeding for long period on them, and a stomach held only small ants), beetles, grasshoppers and larvae; also some vegetable material, including olive flesh. Foods taken to young include moth caterpillars. Perches on low bushes or tree branches, flying to catch prey on ground; sometimes digs with bill into ground, and occasionally sallies after flying insects. In one observation, in Feb, an individual made 33 perch-and-pounce flights in 24 minutes and apparently took food 29 times; typically flew less than 10 m, landed on ground from low perch (under canopy of small tree), hopped once, pecked at substrate, hopped again, then flew back to same or similar perch.
Breeding. Mid-Mar in SW Morocco, Apr–Jul in rest of country, but mid-May to Jun and perhaps Aug at elevations above 2000 m; early Apr to mid-Jun in Algeria and Tunisia; two broods probably common. Nest a cup of dry coarse grass, lined with feathers and hair, usually on ground in shelter of bush, thorn scrub, grass tussock or plant tuft, but often in fork of tree or bush up to 2 m above ground; sometimes placed in base of bush (*Genista*, *Cistus*, *Juniperus*) or amid boulders, or in hole in wall, discarded can, bank, trunk of old tree or traditional thatched roof. Eggs 3–6, usually 4–5, plain pale blue or white. Some brood parasitism by Common Cuckoo (*Cuculus canorus*) occurs. No other information.
Movements. Sedentary to some degree, but clear altitudinal movement and dispersive behaviour, and also a partial migrant. Leaves higher breeding areas Oct–Apr (Nov–Feb on N side of High Atlas above 2000 m and on S side above 2500 m); main downward influx in Morocco only mid-Nov to end Jan, some returning as early as Feb. Other movements little understood. Large numbers in winter in Moulouya Valley, in NE Morocco; in Algeria, where downward movement occurs Oct–Nov (return Feb–Mar), some influx in semi-desert around Mont des Ksours and the Saharan Atlas; in Tunisia appears in coastal regions and deserts. Recorded as vagrant in Mauritania; has also occurred in Europe.
Status and Conservation. Not globally threatened. Common. Considered a scarce breeder in Tunisia; fairly widespread, although it avoids coastal plains.
Bibliography. Arnault (1929), Barreau *et al.* (1987), Beaman & Madge (1998), Bundy (1976), Castell (2000), Cramp (1988), Étchécopar & Hüe (1964), Hollom *et al.* (1988), Isenmann & Moali (2000), Keith *et al.* (1992), Ledant *et al.* (1981), Meinertzhagen (1940), Meise (1959), Niethammer & Laenen (1954), Salewski *et al.* (2003), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Vietinghoff-Scheel (1980b).

279. **Güldenstädt's Redstart**

Phoenicurus erythrogastrus

French: Rougequeue de Güldenstädt **Spanish**: Colirrojo de Güldenstädt
German: Riesenrotschwanz
Other common names: (Large) White-winged Redstart

Taxonomy. *Motacilla erythrogastra* Güldenstädt, 1775, Caucasus.
Species name is latinized Greek adjective, and must therefore agree. Two subspecies recognized.
Subspecies and Distribution.
P. e. erythrogastrus (Güldenstädt, 1775) – Greater Caucasus Mts; non-breeding Transcaucasia and Iran.
P. e. grandis (Gould, 1850) – N L Baikal area, and from Altai and W Mongolia S to E Afghanistan, NW & C China, and in Himalayas; non-breeding also N India and E & S China.



Descriptive notes. 18 cm; 21–29 g. Male nominate race has black face to upper breast, back and wings, white crown and large wing patch, rufous-orange rump and tail, rufous-orange lower breast to undertail-coverts; black bill and legs. Female is plain mid-brown with dull rufous-orange tail (dusky central feathers), slightly buffy wingpanel. Juvenile is brown with buff spotting above, buff with brown mottling below, densest on breast, tail as female; young male has white wing patch. Race *grandis* is paler. Voice. Song, from prominent perch or in display-flight, a series of short clear melancholy whistled phrases mixed with variety of quiet chirps, clicks and twitters, interspersed with mimicry: a rapid whistled "tit-tit-titer" followed by wheezy burst of short notes, very like song of *P. ochruros*. Calls include "drrrrt" in intraspecific aggression, weak "lik" or "tsee" in contact, harder "tek" or "tak-tak-tak" in mild agitation, last two combined to loud "tseee-tek-tek" frequently repeated in agitation near nest.
Habitat. Breeds in alpine zone (above upper tree-line and dwarf-scrub zone) near permanent snows, in dry streambeds, boulder-strewn alpine meadows, stonefields and screes with some trees and herbs, flat parts of high passes, mountain gorges, at 3600–5200 m, occasionally to 5500 m, but mainly (Himalayas) 3900–4800 m; requires combination of rugged rocky terrain and patches of cold-tolerant vegetation. Winters in rocky, scrubby hillsides near streams and riverbeds, rocky moraines, and thickets in valley bottoms, at 1500–4800 m, with great partiality to *Hippophae* thickets.
Food and Feeding. In summer exclusively invertebrates, mostly insects (in particular moths) and spiders; berries prime and perhaps usually sole food in winter, in particular those of sea buckthorn (*Hippophae rhamnoides*), but midges also seen to be taken near water in Jan–Feb. Invertebrate food includes adult and larval beetles of at least seven families, grasshoppers, bush-crickets, bugs, adult and larval lepidopterans, adult and larval flies, ants, ichneumon flies, spiders, centipedes and earthworms; plant food (other than *Hippophae*) includes fruits and seeds of juniper (*Juniperus*), docks and knotweed (Polygonaceae), buttercups (*Ranunculus*), barberry (*Berberis*), joint pine (*Ephedra*), legumes, sedges, grasses and leaves. Stomachs of birds from C Asia, spring to autumn, commonly held beetles, but often also small seeds and leaves; chironomid midges appear important in Caucasus region in Jan–Feb, although winter diet mainly fruit. Forages in short flights from perch; more "nomadic" than congeners, continually moving on to new perch, rather than returning to well-established one, and perhaps more frequently aerial; also sometimes scavenges from dead animals. In one set of observations berries were taken from ground, rather than on bush. Males wintering at high elevations sometimes feed in snow.
Breeding. Jun–Jul in Caucasus and C Asia. Nest a bulky cup of grass and wool, lined with animal hair and feathers, placed well inside crevice in cliff or deep under rocks, amid screes and often adjacent to moraine sediment, often near permanent snow-line. Eggs 3–5, blue (nominate) or white (race *grandis*) with reddish speckles; incubation period 12–16 days; nestling period 14 days (two studies) or 21–22 days (two studies); post-fledging dependence at least 7 days.
Movements. Much of Caucasus population winters in upper R Terek basin, but timing and distance travelled vary with age, possibly sex, and weather: juveniles descend first, Sept in highest areas, Oct–Nov elsewhere, some adults not descending until mid-Dec; return in Mar. Some vertical movements in Himalayas, where some travel farther, perhaps in nomadic fashion; in Ladakh (where a scarce breeder) movements of migrants, possibly originating in Tibet, begin mid-Sept, numbers building steadily to peak passage towards end Oct, and still considerable in early Nov. In Pakistan and China males recorded as remaining at upper elevations, while females descend lower. Russian montane birds descend mid-Sept to mid-Oct and ascend Apr to early May. A summer visitor in EC Afghanistan. Populations in NE part of range to Baikal basin also fully migratory, apparently moving long distance S to NE China.
Status and Conservation. Not globally threatened. In 2000, European population (Caucasus) estimated at 1200–6000 pairs, and generally stable. Common in Caucasus and C Asia; casual in Armenia. Locally common in N Pakistan; fairly common in China. Breeding densities generally fairly low, e.g. three pairs in 3 km² and one pair in 4 km² in Caucasus, rising to eight pairs in 2·5 km² in one area of Russia, and in Pamirs pairs typically 900–1000 m apart. Key threat in Caucasus is recent reduction in quantity and range of *Hippophae rhamnoides* owing to building development; in Caucasus winter densities of 3·8 birds/ha recorded in *Hippophae* thickets; conservation of stands of this plant is urgent in upper Terek basin. Similar considerations may apply in other parts of species' range, since evidently *Hippophae* has remarkable capacity to draw concentrations of this species from very wide areas. In one area of *Hippophae* covering 0·6 ha in Ladakh, as many as 25 individuals were present.
Bibliography. Abdusalyamov (1973), Adamian & Klem (1997, 1999), Ali (1977), Ali & Ripley (1987b), Anon. (2004e), Beaman & Madge (1998), Böhme, I.R. & Böhme (1986), Böhme, R.L. (1958), Chadwell *et al.* (1982), Cheng Tsohsin (1987), Cramp (1988), David & Gosselin (2002a), Dementiev *et al.* (1968), Drozdov & Zlotin (1962), Flint *et al.* (1984), Grimmett *et al.* (1998), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Loskot (1994c), MacKinnon & Phillipps (2000), Martens & Eck (1995), Mauersberger (1980), Meyer de Schauensee (1984), Paludan (1959), Piechocki *et al.* (1982), Potapov (1966), Rasmussen & Anderton (2005), Roberts (1992), Schäfer (1938), Vaurie (1955b, 1972), Walters (1981), Williams (2000).



PLATE 76

inches 3

cm 8

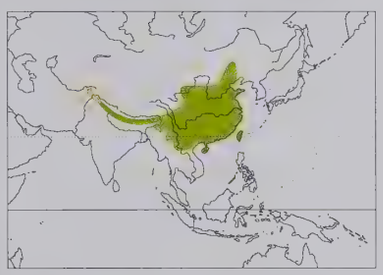
Genus *RHYACORNIS* Blanford, 1872

280. Plumbeous Water-redstart

Rhyacornis fuliginosa

French: Nymphée fuligineuse **German**: Wasserrotschwanz **Spanish**: Colirrojo Fuliginoso
Other common names: Plumbeous Redstart, Water-robin

Taxonomy. *Phoenicura fuliginosa* Vigors, 1831, Simla-Almora, Himalayas.
Has been placed in genus *Phoenicurus*. Females and first-year males in China are browner above, and possibly warrant separation as race *tenuirostris*. Two subspecies recognized.
Subspecies and Distribution.
R. f. fuliginosa (Vigors, 1831) – E Afghanistan and Himalayas E to NE & E China, S to NW Thailand, Indochina and Hainan I.
R. f. affinis (Ogilvie-Grant, 1906) – Taiwan.



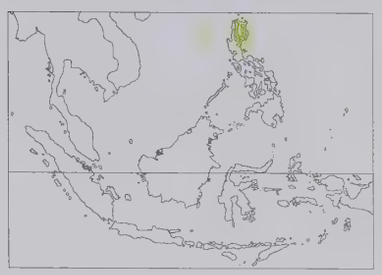
Descriptive notes. 12–13 cm; 13–23 g. Male is slaty-blue, with rufous-chestnut tail and vent, black bill, flesh-coloured legs. Female is slaty-grey above, with two white-spotted wingbars, white rump, black tail with white bases of outer rectrices; whitish with dense grey barring below. Juvenile is like female but browner and stippled buff above. Race *affinis* male is like nominate, female is duller grey above, with narrower area of barring below, and slightly less white on rump and tail. Voice. Song, from large rock in mid-stream or in short aerial parabola from rock to rock, a shrill creaky insistent metallic jingle lasting 2 seconds, rising in pitch, like chirping cricket, "striiii-triiii-triiii-trííífh", repeated 4–7 times; occasionally heard also in winter (in captivity given on moonlit nights). Call a sharp, strident ascending "ziet, ziet", often combined with "tk tk" clicks.
Habitat. Margins and boulders of clear rocky streams and rivers both inside and outside forest, typically ranging from low-gradient streams 3–5 m in width to high-gradient broad, turbulent mountain torrents; occasional visits to adjacent trees and bushes. Breeds at 1000–4000 m in Himalayas, 1200–3600 m in China, and 600–2000 m in Taiwan, wintering down to adjacent lowlands; in Nepal winter abundance greatest at 600–1500 m. In winter, noted as preferring rocky streams at head of reservoirs and concrete channels of water catchments in Hong Kong; in Nepal, males noted on main wide rivers, while females occupied narrower, well-wooded tributaries.
Food and Feeding. Insects, notably caddis flies and their larvae, mayflies and midges; occasionally berries (including *Berberis*) and seeds. In one study in China, 50 out of 58 stomachs examined contained insects and their eggs, mainly coleopterans, lepidopterans, dipterans, hymenopterans, orthopterans, Odonata, and hemipterans (Pentatomidae), while 33 held plant material, including seeds, fruits and leaves; spiders also taken. Makes short flycatching sallies from rocks or overhanging branches, snatches aquatic prey from surface of water, hunts on foot along water's edge and occasionally wades in shallows in search of water-borne prey. In study in Nepal, 57% of observations of foraging position involved mid-river rocks, 34% marginal rocks, 6% riparian ground and 3% shoals or marginal ground, with 75% of prey picked in aerial sally, 13% from shoals or mud, 10% from rocks and 1% from riparian ground or vegetation; main food small flies and midges (Chironomidae, Simuliidae), large dragonflies, butterflies and bees. In study in Taiwan, males foraged for 67% of the time in stream-surface habitats, although these constituted only 19% of total area available to them. Continuously opens and shuts tail scissorwise, and wags it up and down. Remains active into deep twilight.
Breeding. Mar–Jun in Afghanistan, May–Aug in Pakistan, Apr–Aug in Kashmir, Feb–Jun in Nepal and Apr–Jul in China; Mar–Jul in SE Asia, Apr–May in Myanmar; double-brooded. Territory apparently 400–900 m along stream. Nest a neat deep cup of fine roots, grasses, leaves and green moss, lined with rootlets, fibres, wool or hair, placed in hole in rock or bridge abutment, on fern-covered ledge, in side branch of tree, amid overhanging roots or under eaves of old mill, almost always near running water, occasionally up to 50 m away. Eggs 3–5, pale olive-white, greenish or stone with dense dingy yellowish, reddish-brown, umber and/or grey freckles. Rarely, parasitized by Common Cuckoo (*Cuculus canorus*).
Movements. Resident, subject to altitudinal movements, in Pakistan and India; some migrate very short distances, lowest areas perhaps occupied Dec–Jan. Similar movements, also some suspected winter immigration, in Thailand; some local movements in Laos. In Hong Kong a winter visitor, most individuals immatures or females, and 82% of records falling in period Dec–Feb (extremes late Oct to mid-Apr).
Status and Conservation. Not globally threatened. Common in N Pakistan and India; fairly common to common in China; scarce to locally common in SE Asia. On main rivers in Nepal, one bird (predominantly male) found every 50–60 m or so in winter.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Caldwell & Caldwell (1931), Carey *et al.* (2001), Chen (2003), Cheng Tsohsin (1964, 1987), Cruickshank (1913), David & Gosselin (2002b), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Diesselhorst (1968), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Herklots (1967), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Lekagul & Round (1991), Loke Wan Tho (1952), MacKinnon & Phillipps (2000), Manel, Buckton & Ormerod (2000), Manel, Dias *et al.* (1999), Martens & Eck (1995), Martens & Geduldig (1990), Meyer de Schauensee (1984), Neff (1989), Orenstein (1979), Ormerod *et al.* (2000), Paludan (1959), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Tyler & Ormerod (1993), Vaurie (1955b), Zheng Guangmei & Zhang Cizu (2002).

281. Luzon Water-redstart

Rhyacornis bicolor

French: Nymphée bicolore **German**: Luzonrötel **Spanish**: Colirrojo Bicolor
Other common names: Philippine Water-redstart

Taxonomy. *Chimarrhornis* [*sic*] *bicolor* Ogilvie-Grant, 1894, northern Luzon, Philippines.
Monotypic.
Distribution. N Luzon and C Mindoro, in Philippines.



Descriptive notes. 15 cm. Male is like male *R. fuliginosa*, but rufous-chestnut also on rump and belly. Female is like male, but blue areas paler, chestnut areas browner. Juvenile is dark grey with buff spotting. Voice. Calls consist of shrill high whistles.
Habitat. Margins and adjacent boulders and vegetation of clear, undisturbed, fast-flowing, rocky-sided mountain streams (several metres wide) and rivers running through tropical montane forest, pine forest or scrub with scattered trees; from 300 m upwards.
Food and Feeding. Invertebrates, taken from water's edge or on rocks or in flight. Forages mostly on ground, moving quickly from boulder to boulder.
Breeding. Nest with young in Feb, and fledgling in May. One nest found, 1·5 m up rocky bank; had been used also in Mar of previous year. Clutch size reported as 2–4 eggs, usually 3. No other information.
Movements. Probably mainly sedentary. Records in Aug–Dec at migration bottleneck area Dalton Pass, in C Luzon, indicate at least some post-breeding movement, but nature of this phenomenon essentially unknown; possible that records from Mindoro in 1960s involved non-breeding migrants from Luzon.
Status and Conservation. VULNERABLE. Restricted-range species: present in Mindoro EBA and Luzon EBA. Global population placed in range 2500–10,000 mature individuals. In recent review, 20 localities mapped, of which only nine known to involve post-1980 records. Linear distribution along watercourses clearly limits population size, but reasonably common in suitable habitat on Luzon, with 1 pair/200–300 m of stream on Mt Polis, and more recently 1 pair/100–200 m of river has been suggested as normal. Clearance of forest adjacent to watercourses is a threat, compounded by (and compounding) stream siltation and pollution in many areas as a result of logging, mining and agrochemical run-off (including fertlizers, herbicides and pesticides). Northern Sierra Madre Natural Park and adjacent newly protected areas hold important populations. Mount Pulog National Park, in Cordillera Central, is, by contrast, badly affected by settlers, and watercourses are in poor condition. Present for at least part of year in Maria Aurora Memorial National Park, which receives only nominal protection. Recorded on Mindoro in 1960s, but little suitable habitat remains there. Research on ecology, range and status needed, along with more protected areas with strong populations of the species, and greater control of river pollution and damage.
Bibliography. Andersen *et al.* (1992), Collar (1998), Collar, Andreev *et al.* (2001), Collar, Mallari & Tabaranza (1999), Dickinson *et al.* (1991), Hachisuka (1936), Kennedy *et al.* (2000), McGregor (1904a, 1904b, 1909–1910, 1910), Poulsen (1995), Rabor (1955), Stattersfield & Capper (2000), Whitehead (1899b)

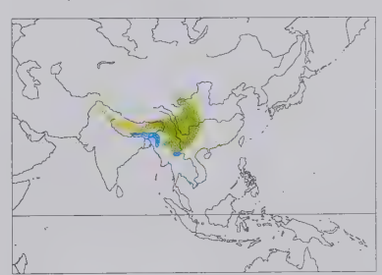
Genus *HODGSONIUS* Bonaparte, 1850

282. White-bellied Redstart

Hodgsonius phaenicuroides

French: Bradybate à queue rouge **Spanish**: Colirrojo Ventriblanco
German: Kurzflügel-Rotschwanz
Other common names: Hodgson's Redstart/Blue Robin/Shortwing, Himalayan Blue Robin

Taxonomy. *Bradypterus phaenicuroides* J. E. Gray and G. R. Gray, 1847, Nepal.
Two subspecies recognized.
Subspecies and Distribution.
H. p. phaenicuroides (J. E. Gray & G. R. Gray, 1847) – Himalayas and W Myanmar; non-breeding N & NE India and N Myanmar.
H. p. ichangensis Stuart Baker, 1922 – C China S to NE & E Myanmar and N Indochina; non-breeding also NW Thailand.



Descriptive notes. 18–19 cm; 22–25 g. Male nominate race is slaty grey-blue, with clear-cut white belly merging with greyish flanks; two small white carpal spots, long black graduated tail with rufous outer bases; bill blackish-brown to yellowish; legs greyish-brown. Female is olive-brown above, more buff-brown below, with vague whitish chin and belly, rufous-tinged flanks and outer tail. Juvenile is like female, but spotted rufous above, scaled brown below; first-year male like female but darker above, with some blue on head, mantle, breast and tail. Race *ichangensis* male is slightly darker blue than nominate, female darker brown above and on flanks. Voice. Song, from covered perch in low dense bushes near forest edge (mainly in twilight and on moonlit nights), a loud, melancholy, usually 3-note whistling cadence, "pe-pee-pit" or "teuuh-tiyou-tuh", middle note highest and longest, last lowest, also "tsee-tsits-rewe" and "tsee-tsri-tse-tik", delivered about five times per minute; reported also as appending to each phrase a short warbled flurry of clear and buzzy notes. Calls include "tsiep tsiep tek tek" in alarm, a subdued, very deep hard "tuk", and grating "chack".
Habitat. Occupies transition zone between open bushy areas and closed forest, clearly preferring undergrowth, bush and scrub adjacent to forest, breeding in thickets of birch, juniper, rhododen-

On following pages: 283. White-tailed Blue Robin (*Myiomela leucura*); 284. Sunda Blue Robin (*Myiomela diana*); 285. Nilgiri Blue Robin (*Myiomela major*); 286. White-bellied Blue Robin (*Myiomela albiventris*); 287. Long-tailed Blue Robin (*Cinclidium frontale*); 288. Whinchat (*Saxicola rubetra*); 289. Stoliczka's Bushchat (*Saxicola macrorhynchus*).

dron, etc., near or at tree-line (penetrating conifer stands), also man-made clearings with luxuriant thickets of *Berberis*, *Rosa* and *Viburnum*, tall herbaceous clumps such as dwarf elder (*Sambucus ebulus*) and Himalayan peony (*Paeonia emodi*); at 2400–3900 m, to 4300 m in China. Winters in bush jungle, scrub, grass, bamboo, secondary growth and undergrowth at edge of broadleaf evergreen forest, from foothills to 1300 m.
Food and Feeding. Insects, berries. Feeds mainly on ground, darting forward in little spurts or runs. Expands and erects tail.
Breeding. End May to Jul. Nest is a deep, bulky cup of grass, dead leaves, roots and stems, lined with finer grass, hair and feathers, hidden on ground in tall herbage or in low bush, e.g. in intertwining branches of *Viburnum nervosum* or dwarf elder. Eggs 2–3, rarely 4, plain deep blue to blue-green. Reputedly parasitized by Common Cuckoo (*Cuculus canorus*). No further information available.
Movements. Altitudinal and short-distance migrant. Arrives on Kashmir breeding grounds mid-May.
Status and Conservation. Not globally threatened. Widespread and fairly common in Himalayas; uncommon to fairly common in China. Rare to uncommon in Myanmar, N Laos and N Vietnam (W Tonkin).
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Landmann & Winding (1993), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Vaurie (1972).

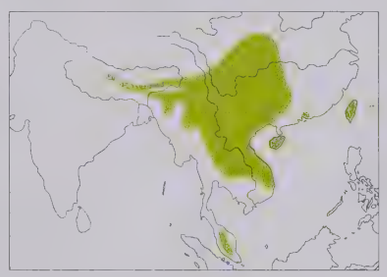
Genus *MYIOMELA* G. R. Gray, 1846

283. White-tailed Blue Robin

Myiomela leucura

French: Notodèle à queue blanche **German**: Schattenschmätzer **Spanish**: Ruiseñor Coliblanco
Other common names: White-tailed Robin

Taxonomy. *M.(uscisylvia) leucura* Hodgson, 1845, Nepal.
Often placed in genus *Cinclidium*. Three subspecies recognized.
Subspecies and Distribution.
M. l. leucura (Hodgson, 1845) – C & E Himalayas and NE India (Assam) E to C China, S to Myanmar, Peninsular Malaysia, C Indochina and Hainan I.
M. l. cambodiana (Delacour & Jabouille, 1928) – SE Thailand and Cambodia.
M. l. montium Swinhoe, 1864 – Taiwan.



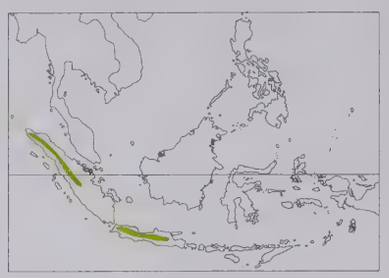
Descriptive notes. 17–19 cm; 24–30 g. Male nominate race is bluish-black, with shiny mid-blue forehead to brow and shoulder patch, very small white neck patch (often concealed), white oval-shaped basal two-thirds of outer tail; bill and legs black. Female has same tail pattern as male, but mouse-brown above, buff-brown below, with indistinct white throat crescent. Juvenile is blackish-brown with buff spotting above, buff streaking below, tail pattern as female. Race *cambodiana* is smaller and slatier than nominate, lacking shiny blue forehead; *montium* is very slightly smaller, female with more olive-toned, less buffy-brown, breast. Voice. Song a series of short well-spaced phrases consisting of thin silvery liquid quavering warble of 7–8 notes, reminiscent of (but deeper and flutier than) song of *Brachypteryx leucophris*: "tey-tlee-i-ta-wey-i". Calls include thin 1–2-note whistles and low "tuc".
Habitat. Thick shady, bushy or scrubby undergrowth of dense moist broadleaf evergreen forest in lower cloud zone, often in bamboo and/or river-valley bottoms near running water. Breeds in Himalayas at 1200–2700 m, wintering from foothills to 1500 m; in Cambodia at 1000 m.
Food and Feeding. Insects, berries. Forages largely on ground, but also in low underbrush, and more arboreal than *Tarsiger* bush-robins. Very secretive. Constantly opens and shuts tail.
Breeding. Presumed Apr–Jun, reportedly into Aug, in Himalayas; Apr onwards in China; as late as Sept in Myanmar; Mar–Apr in Peninsular Malaysia. Nest either domed or cup-shaped, made of grass and mud, placed in shrub close to ground or under rock ledge or fallen tree, or in hole in bank. Eggs 2–5, fairly glossy or glossless white or pale pink to pinkish-brown, plain or with faint darker pinkish freckles. No other information.
Movements. Sedentary; some altitudinal and minor short-distance movements.
Status and Conservation. Not globally threatened. Locally common in India; sparsely distributed in scattered small populations in Nepal. Uncommon in Myanmar, Thailand, Peninsular Malaysia and Indochina; race *cambodiana* thus relatively rare.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Cheng Tsohsin (1987), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Glenister (1971), Grimmett *et al.* (1998), Harrison & Parker (1966), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Medway & Wells (1976), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Wildash (1968), Zheng Guangmei & Zhang Cizu (2002).

284. Sunda Blue Robin

Myiomela diana

French: Notodèle de la Sonde **German**: Diademschmätzer **Spanish**: Ruiseñor de la Sonda
Other common names: Sunda Robin, Indigo Blue Robin

Taxonomy. *Lanius (Notodela) diana* Lesson, 1831, Pegu; error = Java.
Often placed in genus *Cinclidium*. Two subspecies recognized.
Subspecies and Distribution.
M. d. sumatrana (Robinson & Kloss, 1918) – mountains of N & WC Sumatra (Leuser, Kerinci, Berastagi, Dempu).
M. d. diana (Lesson, 1831) – mountains of Java (E to Ciremay).



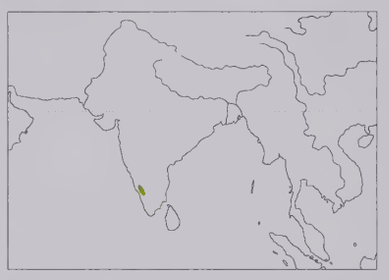
Descriptive notes. 15 cm. Male nominate race is indigo-blue, with silvery-white forehead, (apparently concealed) silvery-white patch on neck side; wings and tail black; bill and legs black. Female is dull rufous-chestnut above, with some whitish on throat, olive-rufous breast, greyish-buff belly to vent. Juvenile is reddish-brown with black spotting. Race *sumatrana* male is like nominate, female darker, purer chestnut above. Voice. Song a simple warble of 2–5 sweet melancholy notes. Calls rarely.
Habitat. Undergrowth of high montane forest; 1000–1500 m in Sumatra, 1000–2400 m in Java.
Food and Feeding. Small insects, including grubs; also worms.
Breeding. Sept–May in W Java. Nest a large ball of fine roots, leaf stems, fern fronds and mosses, built against side of path or placed low in clump of tree-ferns or in mossy tree trunk. Eggs 2, bright pinkish. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA and Java and Bali Forests EBA. Scarce but widespread in Sumatra; uncommon and local in Java.
Bibliography. Andrew (1985), Hellebrekers & Hoogerwerf (1967), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988).

285. Nilgiri Blue Robin

Myiomela major

French: Notodèle à flancs roux **German**: Madraskurzflügel **Spanish**: Alicorto Flanquirrufo
Other common names: Rufous-bellied Shortwing (when treated as conspecific with *M. albiventris*)

Taxonomy. *Phoenicura major* Jerdon, 1841, Nilgiris, India.
Until recently considered a member of genus *Brachypteryx* and treated as conspecific with *M. albiventris*. Monotypic.
Distribution. S Karnataka and Nilgiri Hills, in S India.



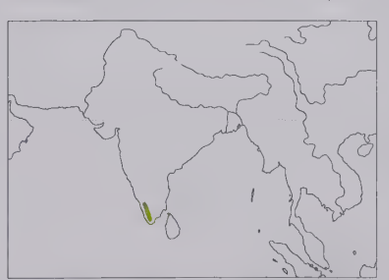
Descriptive notes. 14 cm. Chunky and long-legged. Male is dusky blue-grey above, with dull bluish brow, dusky lores; greyer breast clear-cut from buffy-white mid-belly, fulvous flanks; black bill, pinkish legs. Female is slightly paler. Juvenile undescribed. Voice. Song a short jumble of shrill whistles and harsh notes, combining whistled calls and twangy buzzes, sometimes with mimicry. Calls include a strained, indrawn whistle, and harsher rattles.
Habitat. Undergrowth of sheltered woods (sholas), at 900–2100 m.
Food and Feeding. No information; creeps through vegetation and around fallen timber, presumably foraging for small insects. Secretive and shy.
Breeding. Apr–May. Nest a neat cup made of a soft mass of green moss, lined with fine moss roots, placed in hole in bank or trunk, or in broken stump. Eggs 2–3. No other information.
Movements. Sedentary.
Status and Conservation. VULNERABLE. Restricted-range species: present in Western Ghats EBA. Conservation status was assessed as Vulnerable when species treated as conspecific with *M. albiventris*. In recent review, nine localities mapped, of which six known to involve post-1980 records. Evidence suggests that the species is at least moderately common within its highly restricted range.
Bibliography. Ali & Ripley (1987b), Betham (1902), Betts (1951), Collar *et al.* (2001), Gaston & Zacharias (1996), Grimmett *et al.* (1998), Rasmussen & Anderton (2005), Stattersfield & Capper (2000).

286. White-bellied Blue Robin

Myiomela albiventris

French: Notodèle à ventre blanc **Spanish**: Alicorto Ventriblanco
German: Weißbauch-Kurzflügel
Other common names: White-bellied/Palni Shortwing; Rufous-bellied Shortwing (when treated as conspecific with *M. major*)

Taxonomy. *Callene albiventris* Blanford, 1868, Palni Hills, India.
Until recently considered a member of genus *Brachypteryx* and treated as conspecific with *M. major*. Monotypic.
Distribution. S Kerala and W Tamil Nadu, in S India.



Descriptive notes. 14 cm. Male is slaty-blue above and to breast, shading to blue-grey flanks clear-cut from white mid-belly to vent; white supercilium, black lores; black bill and legs. Female is slightly paler blue. Juvenile undescribed; reportedly spotty. Voice. Song a loud, sustained, sprightly, thrush-like series of short beautiful phrases, each consisting of rich slurred whistles and dry buzzy notes, and rising and falling several times; more organized, musical and warbling than that of *M. major*. Calls reportedly include loud chattering and high whistle.
Habitat. Streamside vegetation and wet areas of undergrowth within forest patches (sholas) and densely wooded ravines; also, in much lower numbers, in wattle (*Eucalyptus*) and old pine plantations contiguous with sholas. Has been recorded in gardens. 1000–2200 m.

Food and Feeding. No information; lives in low vegetation and on ground, where presumably forages for small insects and other invertebrates.
Breeding. Mar–Jul, mainly Apr–May, but juvenile with unossified skull in Jan. Few nests found, much moss used in construction. Other details evidently as for *M. major*.
Movements. Sedentary. Some possible altitudinal movement suspected.
Status and Conservation. VULNERABLE. Conservation status was assessed as Vulnerable when species treated as conspecific with *M. major*. In recent review, 17 localities mapped, of which only eight known to involve post-1980 records. In 4-month field study during Jan–May 2001, 23 sites visited and species seen at eight of these; total of 214 sightings, most in sholas. Locally common within highly restricted range, mist-netting surveys at Kodaikanal (in Palni Hills) suggesting that it is the third most frequent passerine in the study area; much scarcer, however, in other apparently suitable areas.
Bibliography. Ali & Ripley (1987b), Ali & Whistler (1935–1937), Collar *et al.* (2001), Ferguson & Bourdillon (1903–904), Gaston & Zacharias (1996), Grimmett *et al.* (1998), Rasmussen & Anderton (2005), Robertson & Jackson (1992), Stattersfield & Capper (2000), Zacharias & Gaston (1999).

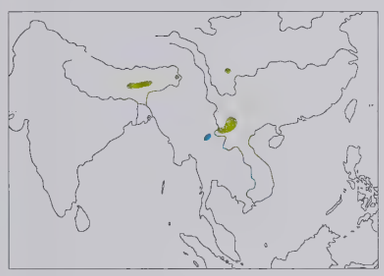
Genus *CINCLIDIUM* Blyth, 1842

287. **Long-tailed Blue Robin**

Cinclidium frontale

French: Notodèle à front bleu **German**: Blauschmätzer **Spanish**: Ruiseñor Frentiazul
Other common names: Blue-fronted Robin

Taxonomy. *Cinclidium frontale* Blyth, 1842, Sikkim, India.
Has been placed in genus *Callene*. Two subspecies recognized.
Subspecies and Distribution.
C. f. frontale Blyth, 1842 – E Nepal, Sikkim and Bhutan.
C. f. orientale (Delacour & Jabouille, 1930) – NE India (E Assam), SC China (SW Sichuan) and N Indochina.



Descriptive notes. 18–20 cm; 25–26 g. Male nominate race is blackish-indigo, with shiny bluish forehead and shoulder, long graduated tail, white patch on underwing primary coverts, narrow whitish scaling on lower belly to vent; black bill (smaller than that of *Myiomela leucura*), long greyish legs. Female is dusky olive-brown, paler below, with whitish throat and belly, white-tipped vent. Juvenile is dark brown, with buff throat streaks and belly tips. Race *orientale* male is darker than nominate, female perhaps paler. VOICE. Song a series of short clear melodious phrases, "tuuii-be-tue... tuu-buudy-doo...". Calls include harsh buzzy "zschwick" in alarm, sharp shrill "shraak" and faint "tch-tch-tch-tch-tch".
Habitat. Dark, densely vegetated gulleys in primary montane broadleaf evergreen forest and bamboo, 1850–2200 m in Himalayas, locally to 3000 m, but down to 800 m in NE India. One seen in spinach crop in Mar in NW Bengal.
Food and Feeding. No information; keeps to low parts of vegetation, clambering among bamboo, and presumably feeds there and on ground on small insects.
Breeding. No information.
Movements. Largely sedentary, some displacement to lower areas in winter.
Status and Conservation. Not globally threatened. Relatively uncommon, and less common than *Myiomela leucura*; degree to which rarity reflects elusiveness unclear, but consensus of assessments suggests that it is, at best, scarce. Very local and scarce in Himalayas; considered extremely rare in China, where recorded in Dafending Giant Panda Reserve. Status in SE Asia uncertain, where the few records may involve non-breeding visitors; rare and poorly known in Indochina in 1930s, and only one confirmed record from N Laos, recorded in extreme NW Vietnam (W Tonkin); only two definite records from Thailand.
Bibliography. Ali & Ripley (1987b), Bishop (1999), Cheng Tsohsin (1987), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inskipp & Inskipp (1993), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Redman (1992), Robson (2000), Thewlis *et al.* (1998).

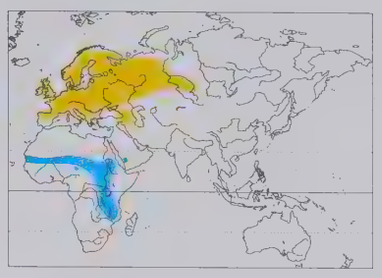
Genus *SAXICOLA* Bechstein, 1802

288. **Whinchat**

Saxicola rubetra

French: Tarier des prés **German**: Braunkehlchen **Spanish**: Tarabilla Norteña
Other common names: Meadow/Grass Chat

Taxonomy. *Motacilla Rubetra* Linnaeus, 1758, Sweden.
Monotypic.
Distribution. Europe E to W Siberia, NW & E Asia Minor, Caucasus and NW Iran; non-breeding Africa.
Descriptive notes. 12–14 cm; 13–26 g. Breeding male has buff-streaked blackish face and crown, with prominent white supercilium, narrow white line from chin to neck side, buff mantle to rump with blackish streaks and spots, blackish wings with buff edgings and white alula, short black tail with white outer bases; rufous-ochre below, shading to white on belly; bill and legs black. Non-breeding male buffier on head, with dark stippling on breast. Female is like male but less distinctly marked, with buffy supercilium and brown face, less white in wing and tail. Juvenile is like female,



with dark mottling and scaling on breast and flanks. VOICE. Song, by male only (often at night in spring; rarely in winter quarters), a series of loud, fast and abrupt short phrases (1–1·5 seconds long), each a buoyant jumble of scratchy rattles, hoarse rasps, clear whistling and (often excellent) snatches of mimicry; in courtship song becomes softer "ziwüziwü", and in male–male confrontations a rapid scratchy rattling. Calls include whistled "fiu" or "djü" for alarm-contact, harsh "tec tec" in stronger warning, and a combination of both, e.g. "hüü-tuc-tuc", in alarm near nest.
Habitat. Breeds in wet meadows, pastures, bogs, upland grassland, bracken-covered hillsides, heath, dry or wet open scrub and fringes of reedbeds, general requirement being for scattered shrubs, bushes, trees or man-made perches for songposts and foraging vantages, and low herb cover and bare ground in which to forage (shrubs and herb layer also needed for nesting). Precise factors in ecological separation from widely sympatric *S. torquatus* in W Palearctic not quantified, but tends to occupy wetter, grassier, more open terrain with less woody-stemmed vegetation; yet also more flexible, occurring in Finland and Russia in glades, clearings and burns inside forest, and sometimes perching high on dead tree or flagpole. In Poland, favours abandoned cropfields with well-developed layer of dried perennials (*Tanacetum vulgare*, *Artemisia vulgaris*, *Solidago*) from previous year; probability of occupation was 50% in fields of c. 1·8 ha, rising to 100% in fields larger than 13 ha, with density of territories negatively correlated with size of field, and single males inhabiting smallest fields. Reaches 500 m in Britain, 1800 m (rarely 2200 m) in Switzerland, 2230 m in Armenia. In parts of range, some evidence that Great Grey Shrike (*Lanius excubitor*) inhibits settlement of otherwise suitable habitat. In African winter quarters occupies moist open areas with low perches; open or lightly bushed grassland, grassy marsh (avoided in Ivory Coast), forest edge and clearings, degraded savanna, gardens, fallow and harvested fields, bare hilltops; home ranges 0·4 ha and contain 3–12 bare patches of ground used for foraging from low perch. In Sierra Leone occasionally in small mangroves; in Uganda in tall grassland up to 2300 m.
Food and Feeding. Mainly invertebrates, supplemented in autumn by fruit or seeds. Animal food includes adult and larval beetles of at least twelve families, adult and larval lepidopterans of at least three families, flies of at least eight families, sawflies, ants and bees, mayflies, dragonflies, grasshoppers, earwigs, bugs, caddis flies, spiders, woodlice, centipedes, millipedes, snails and earthworms. In three small samples of stomachs from Russia and Ukraine, spring, summer and autumn, beetles and ants predominated by number, with following data from Sept: 28% beetles, 25% ants, 17% bugs, 3% grasshoppers, 8% unidentified insects, and 19% Solanaceae seeds. In other samples beetles sometimes exclusively taken, while only other reported plant food is blackberry (*Rubus fruticosus*), taken in autumn prior to migration. Young at five Russian nests fed mainly with mid-sized prey, initially soft-bodied animals such as small spiders and sawfly larvae. Of 709 prey items brought to large nestlings in Poland, 25% were adult and 16% larval lepidopterans and sawflies, 15% craneflies, 13% grasshoppers, 10% spiders, 6% flies, 11% unidentified insects, and less than 5% snails, Odonata, beetles and wasps. In Switzerland, elevational influence of proportions of animal food fed to nestlings revealed by study of 15 nests at 900–1000 m and five nests at 1400–1500 m, respectively yielding 27% and 60% hymenopterans, 27% and 2% beetles, 21% and 12% flies, 14% and 18% lepidopterans, 3% and 4% grasshoppers, 2% and 0% bugs, 3% and 2% snails, 2% and 2% spiders, 1% and 0% earthworms, but with complete avoidance of abundant moths *Odetia atrata*, scorpionflies, staphylinid and chrysomelid beetles and dungflies. Forages from perch, taking prey from ground, less frequently from vegetation or in flight; aerial sallying may be common in winter quarters, where tall grass often covers and hides open ground. Sometimes establishes temporary territory on wintering grounds.
Breeding. Mid-Apr to early Aug in NW Europe. Territory less than 1 ha, average 0·43 ha in Netherlands, at least 0·75 ha in W Germany; site-fidelity among adults high (of 54 breeding males, 47% returned to same area after one year, 15% for two years and 4% for three years, and almost half of all these reoccupied same territory). Nest a cup of grass stems, leaves and moss, lined with fine stems and hair, placed in low bush or tussock. Eggs 4–7, pale blue with fine reddish-brown speckling; incubation period 12–13 days; nestling period 12–13 days, although young not capable of flight until 17–19 days; post-fledging dependence 15–18 days. In Britain, hatching success 72% and fledging success 94%, giving 86·5% overall breeding success. Causes of mortality among ringed individuals in NW Europe are domestic predator 10%, human-related (accidental) 24%, human-related (deliberate) 55%, other 11%. Age of first breeding 1 year.
Movements. Migratory, most wintering in tropical Africa; loose aggregations form during migration. Leaves European breeding grounds late Aug to Sept (juveniles generally earlier than adults), those from NW & C Europe moving SW through W France, W Iberia and W Mediterranean, passing through Spain and N Africa late Aug to Nov/Dec (main passage mid-Sept to end Oct) and through N tropics late Sept to mid-Nov; paucity of ringing recoveries in autumn from N Africa suggests that many make single flight across Sahara from S Europe. E populations migrate through Middle East; main passage Israel mid-Sept to mid-Oct, Jordan mid-Sept to early Oct, Bahrain (scarce) Sept–Oct; passage in Africa generally light, suggesting broad-front movement and often in a single step; rapid passage in Eritrea late Aug to mid-Sept. Main arrival in winter quarters Oct–Nov, but in extreme S areas (Zambia, Malawi) only late Oct to Dec; ringing recoveries from Tunisia and Libya and from Togo and Nigeria suggest origin in C Europe; birds on passage in Egypt and Ethiopia and wintering in E & S of African range presumably originate in Russia. Spring departure mainly Feb in Zambia, otherwise mid-Mar to early Apr, and in W Africa mainly early Apr; passage in Senegal mid-Mar to early May, in Ethiopia mid-Apr, but many migrants appear to undertake direct long-haul journey to reach at least N Africa, where passage strong between late Mar and mid-May; main spring passage Israel Apr and first half May, Jordan mid-Apr to early May, UAE second half Mar to end Apr, Bahrain late Mar to mid-May (mostly Apr). Arrival on breeding grounds mid-Apr in S, late Apr or early May in C & NW Europe, but many N parts of range not occupied until late May.
Status and Conservation. Not globally threatened. European population in mid-1990s estimated at 2,441,507–3,044,673 pairs (highest numbers in Belarus, Latvia and Finland), with additional 100,000–1,000,000 pairs in Russia and 500–5000 pairs in Turkey; at that time Spain estimated to hold 15,000–20,000 pairs, although more recently minimum population put at 2775 pairs. By 2000 total European population (including European Russia and Turkey) revised to 5,400,000–10,000,000 pairs, and considered generally stable. Densities in optimal habitat on unimproved farmland, abandoned farmland and high alpine meadows 1 pair/ha (100 pairs/km²), but commonly less, e.g. 0·8 and 0·65 pairs/ha in lower alpine meadows and falling to 0·06–0·12 pairs/ha in S Wales and 0·03–0·04 pairs/ha in SW Scotland. Since 1955, densities in W & C Europe have been declining with agricultural intensification, and populations in Britain, Netherlands, Belgium, Luxembourg and Germany have fallen by 50%, although lessening or levelling c. 1980 owing to reductions in rates

of farming intensification; but only 5–7 pairs left in Belgium in 1998. In some areas (e.g. SW Germany), key issue is date of mowing; and in France intensive farming in Auvergne directly caused loss of 72% of first broods through early harvesting, and 63% of second broods. Rate of deliberate capture in winter quarters of birds ringed in NW Europe remarkably high, and may be a factor in declines. In Africa, common to abundant visitor in guinea savanna and savanna–forest mosaic, less common in soudan belt; frequent to uncommon E of L Victoria and S of c. 3° S; density in N DRCongo 0·8 birds/ha.

Bibliography. Andersson (1981), Andrews (1995), Anon. (2004e), Ash (1980), Bannerman (1953), Barlow *et al.* (1997), Bastian, A. & Bastian (1994), Bastian, H.V. (1992, 1993), Bastian, H.V. & Bastian (1993), Baumgart *et al.* (1995), Beaman & Madge (1998), Benson (1946a), Benson & Benson (1977), Benson *et al.* (1971), Borrow & Demey (2001), Branciforti & Muller (2003), Britton (1980), Bueno (1991), Bundy (1976), Callion (2002b), Cave & MacDonald (1955), Chapin (1953), Cheke & Walsh (1996), Colston & Curry-Lindahl (1986), Coppee (1998), Cramp (1988), Curry & Sayer (1979), Dejaifve (1994), Dementiev *et al.* (1968), Draulans & van Vessem (1982), Duckworth (1994), Dunn (1994), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Fuller & Glue (1977), Gallagher & Woodcock (1980), Gatter (1997), Glutz von Blotzheim & Bauer (1988), Goodman *et al.* (1989), Gore (1990), Grimes (1987), Groebbels (1950), Hagemeijer & Blair (1997), Hirschfeld (1995), Hollom *et al.* (1988), Horstkotte (1962), Hüe & Étchécopar (1970), Illera (2003a), Irwin (1981), Isenmann & Moali (2000), Jensen & Kirkeby (1980), Kasparek (1992), Keith *et al.* (1992), Labhardt (1988a, 1988b), Ledant (1986), Ledant *et al.* (1981), Lennerstedt (1964), Leroy (2003), Lewis & Pomeroy (1989), Maclean (1993), Moreau (1961), Morel & Morel (1990), Nightingale & Hill (1993), Nikolaus (1987), Oppermann (1990, 1999), Orlowski (2004), Parker (1990), Paz (1987), Pearson (1972), Portenko & Stübs (1971), Porter *et al.* (1996), Rasmussen & Anderton (2005), Rebstock & Maulbetsch (1988, 1993), Richardson (1990), Roselaar (1995), Sacher (1993), Schmidl (1982), Schmitz (2000), Schwager & Güttinger (1984), Shirihai (1996), Sinclair & Ryan (2003), Skerrett *et al.* (2001), Smith (1966), Steinfatt (1937), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Urquhart (2002), Vaurie (1955b), Wozniak (1997), Zimmerman *et al.* (1996), Zink (1980).

289. Stoliczka's Bushchat

Saxicola macrorhynchus

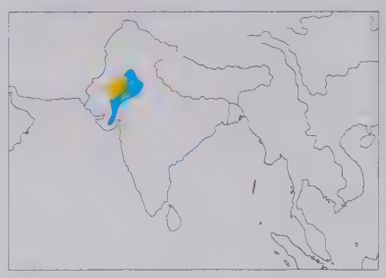
French: Tarier de Stoliczka **German**: Wüstenbraunkehlchen **Spanish**: Tarabilla de Stoliczka
Other common names: White-browed Bushchat, Stoliczka's Whinchat

Taxonomy. *Pratincola macrorhyncha* Stoliczka, 1872, near Rápúr, Wagur District and near Bhúj, Kutch, India.
Monotypic.

Distribution. Thar Desert of Rajasthan, in W India.

Descriptive notes. 17 cm. Male is blackish-brown from crown to upper rump, with whitish supercilium, black face, white band on primary coverts and scapulars, white lower rump and outer bases of blackish tail; white below, with buff-stained breast and flanks; in fresh plumage black areas buffer, broad dark malar, resembles winter male *S. rubetra* but much paler below, and rump plain rufous-tinged buff; bill and legs black. Female is like fresh-plumaged male, but paler-faced and paler-backed, with no white in wings or tail. Juvenile is like female, but darker above and dark-dappled on breast. Voice. Song a low musical "twitch-chhe chee chee"; subdued song in late winter classed as subsong. Calls include soft "chit-chit" and soft deep "prupp prupp".

Habitat. Dry sandy semi-desert and desert plains with low herb layer and shrubs and very scattered bushes, and with bare ground over 50–75% of substrate; shrubs identified in habitat included *Capparis decidua* as dominant, with *Crotolaria burhia*, *Aerva persica*, *A. pseudotomentosa* and *Cassia italica*, and this biotope shared with *Oenanthe deserti*. In Pakistan (probably extinct), reported as favouring plains consisting of hard sandy soil, small sand dunes and broken ground sparsely vegetated with small desert plants; also reported from arid subtropical thorn-scrub and, anomalously but apparently reliably, one area of reedbeds and tall grass produced by canal seepage. In winter, habitat in Haryana (India) typified by short clumps of coarse grass within areas of very short grass or bare sandy substrate, and with a few thorn trees, individuals holding feeding territories of c. 0·2 ha.



Food and Feeding. Mainly insects, especially beetles, ants (including *Camponotus*) and flying insects. Stomachs contained beetles (including carabids), larvae and green vegetable matter. Forages from low open perch such as bushtop or grass stem, also telegraph wires, flying to ground to take food item or sallying in air; unlike many chats, including congeners, often remains on ground, hopping, for several minutes at a time, rather than returning to perch. When actively feeding, average time lapse between aerial sallies 17 seconds; this type of foraging commonest in middle of day and in evening, when flying insects most abundant. In colder conditions, most foraging is terrestrial.

Breeding. Juveniles recorded in Aug and Sept; recent evidence suggests that breeding may occur Mar–Jun, before monsoon flooding, or at start of Jun, coinciding with start of monsoon (in areas where rains weakest). No other information.

Movements. Poorly understood, and evidence conflicting. Most records are from winter period (Nov–Mar) and in W Rajasthan, and pairs may move to deserts of N & W Rajasthan to breed, or into climatically less harsh areas to NE; non-breeding visitor to Gujarat, and recently found in Haryana in late winter. Pattern of movement may be dictated by weather, and hence different from year to year, but seems likely to be local and short-distance. Old records from Afghanistan may reflect a more obviously irruptive or dispersive behaviour when population levels were higher.

Status and Conservation. VULNERABLE. CMS Appendix II. Global population placed in range 2500–10,000 mature individuals, and considered declining. In recent review, 46 localities mapped, of which only 16 known to involve post-1980 records. In 1993–1994, four intensive surveys located c. 86 birds in W Rajasthan, including 25 over 45-km stretch on one day, suggesting that the species may remain very locally common. Nevertheless, historical evidence strongly indicates that it has undergone a chronic and considerable decline in numbers and range; until 2001, all 21 localities making up N half of known range involved pre-1950 records, and the species is apparently extinct in Pakistan (12 historical localities) and Afghanistan (two historical localities). Principal threat is increasing encroachment and agricultural intensification, primarily through development of irrigation schemes in semi-arid areas: area of irrigated land in Sind (Pakistan) rose from 4% c. 1850 to almost 100% by 1970, resulting in loss of huge expanses of scrubby desert, and similar pattern exists in India, where construction of the Rajasthan Canal expected to compound the problem. Introduction of modern farming techniques, coupled with high levels of overgrazing by livestock, is also responsible for seriously reducing habitat. Presence in Desert and Keoladeo Ghana National Parks and Ranthambore Sanctuary, in Rajasthan, and Velavadar National Park, in Gujarat, only partly reassuring, as the species is apparently migratory. Some strictly protected areas will be necessary to safeguard core populations when these have been identified.

Bibliography. Ali & Ripley (1987b), Collar *et al.* (2001), Dharmakumarsinhji (1955), Grimmett *et al.* (1998), Harvey (2002), Hüe & Étchécopar (1970), Hume (1877b, 1878c), Rahmani (1993, 1995, 1996), Rasmussen & Anderton (2005), Roberts (1992), Roy (1948–1949), Stattersfield & Capper (2000), Stoliczka (1872), Ticehurst (1926–1927), Urquhart (2002), Whistler (1922a).

PLATE 77 ➤

PLATE 77



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292

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ssp *torquatus*

ssp *sibilla*

ssp *axillaris*

ssp *albofasciatus*

ssp *rubicola*

ssp *variegatus*

ssp *maurus*

ssp *przewalskii*

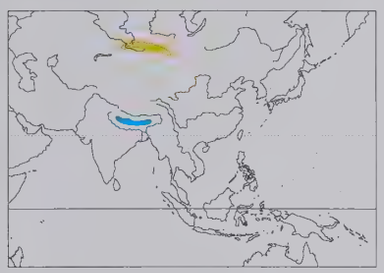
variants

290. Hodgson's Bushchat

Saxicola insignis

French: Tarier de Hodgson **German**: Mattenschmätzer **Spanish**: Tarabilla de Hodgson
Other common names: White-throated Bushchat

Taxonomy. *Saxicola insignis* J. E. Gray & G. R. Gray, 1847, Nepal.
Monotypic.
Distribution. E Kazakhstan, extreme S Russia (Altay) and W Mongolia; non-breeding mainly N India and Nepal.



Descriptive notes. 17 cm. Large stonechat. Male has black head down to cheek and ear-coverts, black back, wings and tail, white chin to hindneck, white rump, large double wing patches, bright chestnut breast patch, white lower underparts; in fresh plumage similar basic pattern but much buffier above, with orange-buff rump, and orange-buff below from lower throat to flank sides and rump; bill and legs black. Female is blackish-brown above, with buffy supercilium, whitish throat and neck side, whitish wing patches, orange-buff breast to flanks and rump, in fresh plumage buffier with dark diamond pattern above, plain buff below and on throat. Juvenile apparently undescribed. VOICE. Song apparently undocumented. Calls include metallic "teck-teck".
Habitat. Breeds in wet alpine and subalpine meadows and scattered montane scrub, hilly semi-desert plateaux with sparse grass cover, scattered shrubs and boulders and rocky outcrops, at 2100–3100 m; presence of water-bearing gulleys and ravines perhaps crucial. In one area, perched on rocks and on tops of shrub willow (*Salix arbuscola*) and birch (*Betula exilis*). Winters in wet and dry grasslands, especially open short-grass plains, reedbeds and tamarisk clumps along watercourses, also sugar-cane fields, in open terrain below 250 m, with optimum habitat apparently a mosaic of disturbed (burned or grazed) and undisturbed areas; newly formed *Saccharum spontaneum* grassland appears also to be favoured. On migration recorded to 4500 m.
Food and Feeding. Terrestrial insects, including tenebrionid beetles, and various flying species, including moths; also their larvae. No information from summer quarters. In winter in Nepal, typically perches on stems 3–5 m high, and defends small but constant foraging territory. Forages in fairly typical manner, dropping to ground from perch, occasionally sallying to take insects in flight; noted as spending rather more time on ground (periods of 30 seconds being normal). Will sometimes follow large mammals such as swamp deer (*Cervus duvauceli*) and human beings, apparently alert for flushed insects.
Breeding. Jun–Jul; possibly double-brooded, nests with fresh eggs seen at same time as newly fledged young (but former could be replacements). Appears to be semi-social, with small aggregations of pairs and small individual territories; in one case only 300 m between nests, and in another pairs with young only a few tens of metres apart. Nest a bulky thick-walled cup, wider at base than at top, made of dry grass, lined with wool, feathers and dry moss, placed in earth wall or rock crevice in shallow ravine or gulley in shelter of overhanging grassy turf. Eggs 4–5; incubation by female; both parents tend young.
Movements. Migratory; winters at foot of C & E Himalayas. Present in winter quarters Oct–Apr (latest 6th May). Records from China in Apr–May, Aug and Oct; distribution of these somewhat to E of known summer and winter quarters, suggesting arched migration route through Qinghai and Ningxia (one record Yunnan), rather than more directly through Xinjiang and Tibet; in spring, valleys of R Yalung and R Yangtze appear to be favoured routes. Recorded Feb–Apr in NE India (Assam), where individuals hold feeding territories before moving on; one spring record in Bhutan. Great preponderance of males in known winter quarters and, indeed, on migration in China (of c. 50 birds at one site, only one was female) raises possibility that females occupy a different non-breeding range.
Status and Conservation. VULNERABLE. CMS Appendix II. Global population in range 2500–10,000 mature individuals, and considered declining; a worse-case scenario places global total at below 1000 birds. In recent review, 47 localities mapped, of which only eleven known to involve post-1980 records (although breeding-ground records, of which there are 18, are largely undated but probably recent). Apparently unreported from E Kazakhstan since 1930s. Population in S Russia adjacent to Mongolia border discovered in 1970s, not more than four pairs, possibly now extinct. Fairly large population found in Khangai Mts, in Mongolia, in 1929, and smaller numbers in Mongolian Altay range in 1979; evidence from Khovd province suggests that the species is potentially widespread there. Regular wintering population in India may be as low as 100; may be found to be present in unsurveyed areas in Assam, but species is scarce and irregular in Kaziranga and Manas National Parks. Once considered common in winter in Nepal, but studies in 1998 led to estimation of just 110 wintering birds, majority in Sukla Phanta Wildlife Reserve. Major threat is apparently rapid and extensive loss and degradation of winter grasslands owing to drainage, conversion to farmland, overgrazing, grass-harvesting, inappropriate grassland management and heavy flooding, the last caused partly by deforestation in catchment areas. Wintering individuals regularly occur in several protected areas, including (in addition to the above-mentioned) Corbett National Park, in India, and Lumbini Crane Sanctuary, Kosi Tappu Wildlife Reserve and Royal Chitwan National Park, in Nepal. Surveys of the species' breeding areas are called for, along with better grassland management in winter quarters.
Bibliography. Ali & Ripley (1987b), Baral (1998), Baral *et al.* (1996), Cheng Tsohsin (1987), Collar *et al.* (2001), Dementiev *et al.* (1968), Grimmett *et al.* (1998), Hume (1880), Inglis (1951–1969), Inskipp & Inskipp (1991), Kishchinskiy *et al.* (1982), Kozlova (1932–1933), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Narayan & Rosalind (1997), Neufeldt & Vietinghoff-Scheel (1982), Panov (1976), Ponomareva & Vinokurov (1984), Rasmussen & Anderton (2005), Schäfer (1938), Stattersfield & Capper (2000), Urquhart (2002), Vaurie (1972).

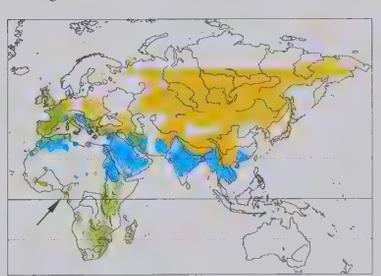
291. Common Stonechat

Saxicola torquatus

French: Tarier pâtre **German**: Schwarzkehlchen **Spanish**: Tarabilla Común

Other common names: Collared Stonechat, Collared Bush Chat; European Stonechat (*hibernans*, *rubicola*); African Stonechat (Afrotropical races); Ethiopian Stonechat (*albofasciatus*); Siberian Stonechat (*maurus*)

Taxonomy. (*Motacilla*) *torquata* Linnaeus, 1766, Cape of Good Hope, South Africa.
Has been considered conspecific with *S. dacotiae*, but morphological differences sufficient to warrant treatment as two separate species; has also been treated as conspecific with *S. tectes* and *S. leucurus*. Recently proposed that races form three distinct species, European *S. rubicola* (including race *hibernans*), Siberian *S. maurus* (including *variegatus*, *armenicus*, *indicus*, *przewalskii* and *stejnegeri*) and African *S. torquatus* (remaining races); extent to which these groups satisfy any criteria for species recognition, however, is unclear, and variation within groups is considerable. Alternatively, further splitting could be argued for, e.g. in the case of rather distinct and apparently parapatrically abutting forms *indicus* and *przewalskii*. Variation also exists within races, and several taxa may be unworthy of recognition while others may deserve reinstatement. Birds on Sicily included in *rubicola*, but most closely resemble *maurus* (hence a challenge to the splitting of latter), and have been named *archimedes*. Races *adamauae* (N & W Cameroon) and *pallidigula* (Cameroon Mountain and Bioko I) are treated as synonyms of *salax*, and *altivagus* is included in *promiscuus*. Racial affiliation of population recently found breeding in NW Thailand unknown. Twenty-four subspecies recognized.
Subspecies and Distribution.
S. t. hibernans (Hartert, 1910) – Ireland, Britain, W France and W Iberian coast.
S. t. rubicola (Linnaeus, 1766) – W, C & S Europe, NW Africa, and Turkey E to W Caucasus area; non-breeding also N Africa E to Middle East.
S. t. variegatus (S. G. Gmelin, 1774) – E Caucasus area E to lower R Ural and S to NW Iran; non-breeding NE Africa.
S. t. armenicus Stegmann, 1935 – SE Turkey, Transcaucasia and SW Iran; non-breeding also SW Asia and NE Africa.
S. t. maurus (Pallas, 1773) – E Finland and N & E European Russia E to Mongolia, E Tien Shan and Pakistan; non-breeding SW & S Asia.
S. t. stejnegeri (Parrot, 1908) – E Siberia E to Anadyrland, S to E Mongolia, NE China, Korea and Japan; non-breeding E & SE Asia (S to Malay Peninsula).
S. t. indicus (Blyth, 1847) – NW & C Himalayas; non-breeding Pakistan and C India.
S. t. przewalskii (Pleske, 1889) – Tibetan Plateau E to C China, S to NE Myanmar and Indochina; non-breeding N & NE India E to SE China and SE Asia.
S. t. moptanus Bates, 1932 – Senegal Delta and S Mali (inner Niger Delta).
S. t. nebularum Bates, 1930 – Sierra Leone E to W Ivory Coast.
S. t. jebelmarrae Lynes, 1920 – E Chad and W Sudan (Darfur).
S. t. salax (J. Verreaux & E. Verreaux, 1851) – E Nigeria S to NW Angola, including Bioko I (Fernando Póo).
S. t. felix Bates, 1936 – SW Saudi Arabia and W Yemen.
S. t. albofasciatus Rüppell, 1845 – SE Sudan, Ethiopian Highlands and NE Uganda.
S. t. axillaris (Shelley, 1885) – E DRCongo E to Kenya and N & W Tanzania.
S. t. stonei Bowen, 1932 – SW Tanzania S to S & E Angola, NE Namibia, Botswana and N South Africa.
S. t. promiscuus Hartert, 1922 – S Tanzania S to E Zimbabwe and W Mozambique.
S. t. torquatus (Linnaeus, 1766) – South Africa (Northern Province S to SW Western Cape) and W Swaziland.
S. t. oreobates Clancey, 1956 – Lesotho Highlands.
S. t. clanceyi Latimer, 1961 – coastal Western Cape.
S. t. voeltzkowi Grote, 1926 – Grand Comoro (Njazidja), in Comoro Is.
S. t. sibilla (Linnaeus, 1766) – Madagascar (except N massif and C area).
S. t. tsaratananae Milon, 1951 – Tsaratanana Massif, in N Madagascar.
S. t. ankaratrae Salomonsen, 1934 – Ankaratra Massif and adjacent C part of W savannas, in C Madagascar.



Descriptive notes. c. 12·5 cm; 13–17 g. Male nominate race has black hood linking down nape to black back (variable brown tips) and wings, with broad white lateral neck patch (sometimes extending narrowly down flank), large white wing patch, white rump and uppertail-coverts; breast and flanks rufous-chestnut, belly to undertail-coverts paler to white; in fresh plumage, browner above, white collar reduced, underparts more extensively (but paler) rufous-chestnut; bill and legs black. Female is buff-streaked dark brown above, with indistinct pale supercilium, vague pale neck patch (often absent), smaller white wing patch, white uppertail-coverts, grey-brown throat, paler rufous-orange breast and flanks shading to whitish on belly to vent; in fresh plumage similar, but with buff edging above, throat paler. Juvenile is dark brown above with buff streaking and supercilium, buffish rump, small white wing patch, buffy below, with dark streaking on breast and flanks. Race *rubicola* has basic pattern of nominate, but vestigial (mostly dark-streaked) white rump, much smaller white wing patch, rather smaller white neck patch, slightly paler (orange-rufous) red below; *hibernans* is marginally darker than previous, with neck patch smaller, rump with less white; *variegatus* has reduced red on breast, white (buff in female) inner two-thirds of outer tail; *armenicus* is large, with rather more red on breast than nominate; *maurus* has white rump, more extensive white on neck and wing patch than previous races, red more restricted to breast centre; *indicus* is similar to last but marginally smaller, with less white on rump; *stejnegeri* is also similar, but rather less white on rump; *przewalskii* is largest, black of throat extending to upper breast, breast richer chestnut than in other Asian races; *felix* has central breast to upper belly orange-chestnut; *albofasciatus* is like nominate but with black, instead of red, on breast; *jebelmarrae* is slightly paler red than nominate; *moptanus* has small bib-like pale red breast patch; *nebularum* is darker red than nominate; *promiscuus* has black of hood extending to upper breast, red restricted to tiny adjacent area on upper breast; *axillaris* is very like previous, but sometimes with black partly extending over red; *salax* is also very similar, but with marginally more and paler red; *clanceyi* has red on breast reaching only to tips of primary coverts; *stonei* is like last, but red paler and with buffish below; *oreobates* resembles last, but darker red and darker buff; *sibilla* has hood extending to upper breast, with small adjacent area below dark bright chestnut; *ankaratrae* is similar to last but larger;

On following pages: 292. Fuerteventura Stonechat (*Saxicola dacotiae*); 293. Reunion Stonechat (*Saxicola tectes*); 294. White-tailed Stonechat (*Saxicola leucurus*).

tsaratananae is also similar, but lower breast blackish, with only tips chestnut; *voeltzkowi* is very like nominate, but red slightly darker. Voice. Song, by male only, a series of phrases each consisting of short gabbled jingling warble, shriller and plainer than that of *S. rubetra* (and with less mimicry, and less rattling and rasping), combining sweet thin whistles and dry trills, but richer and more varied when given in short bouncing display-flight. Calls include high upslurred "whit" in warning, harsh "trac" in self-advertisement on territory, these two often combined as "whit trac-trac" in greater alarm; also brief hoarse rattling "krrrr" in male–male interactions, drawn-out "whiiiii" in courtship and other social contexts, quiet "sisisisisi" by soliciting female, and "chee-chee" in high male aggression.

Habitat. Variety of essentially open, usually rather barren landscapes; in E third of range occupies taller habitat than elsewhere. In Europe open scrubby country where bushes and shrubs of different height, and/or low man-made structures such as stone walls, fence lines, telephone wires and field posts, sit within or adjacent to flat or rolling terrain with uneven herb-rich substrate: alpine moorland, heathland, grassy hillsides, dry plains, bush-studded pastures, woodland edge, sandy forest clearings, field margins and fallows, wide shrubby riverbeds, open garrigue with *Cistus*, unkempt marshy areas, swamp fringes, roadsides and railway margins, vineyards; sea-level to 500 m, but to 800 m in C Europe and, exceptionally, 1850 m in Italian Alps. In Britain prefers rough coastal grassy areas with patches of gorse (*Ulex*), heather (*Calluna* or *Erica*) and bracken (*Pteridium*); in Belgium often along margins of railtracks and canals. Siberian races *maurus* and *stejnegeri* prefer moist meadows with plentiful grass, tall herbage, shrubby marshes and dry pinewoods on hillsides, reaching 3000 m, locally 4000 m. In high Himalayas and Tibet, race *przewalskii* occupies stony barren ground and alpine meadows with scattered rhododenron, cotoneaster, willow, *Caragana*, *Rosa* and juniper bushes. In India, breeds at 700–3000 m; in winter in open country, fallow land, high grass, reedy wetland margins, cultivated terraces, pastures and scrubby hillsides, mangroves and sea-holly patches along tidal creeks. Winter visitors (*stejnegeri*) in Malay Peninsula occupy buffalo pasture, paddyfields, tin-tailings and marshes in lowlands. In NW Africa breeds in macchia, thorn and cactus hedges, scrubby roadsides with telephone lines, farmland and fallowland with scrub cover (*Ziziphus lotus*, *Chamaerops humilis*), scrubby plains and open bushy hillsides (e.g. with *Euphorbia*), grassy woodland clearings and, in drier areas, vegetated fringes of waterbodies, from sea-level to at least 2000 m; winter visitors from Palearctic use coastal scrub, bushy hillsides and wadis and desert oases across N Africa. Mainly montane in sub-Saharan Africa, typically at 1800–3000 m in S Sudan and Ethiopia, 1500–3000 m in Kenya and Uganda, and 1000–2000 m farther S, but races *moptanus* and *clanceyi* occupy lowlands, former in floodplain, latter in coastal dunes. In Madagascar found in remote and isolated patches of slash-and-burn agriculture within rainforest; also (race *sibilla*) in montane scrub and most stunted sclerophyllous montane forest at Zahamena. At 500–2360 m on Grand Comoro.

Food and Feeding. Almost entirely invertebrates, mainly small or medium-sized insects and their larvae; occasionally small vertebrates, seeds and fruit. Animal food in W Palearctic includes adult and larval beetles of at least eight families, adult and larval lepidopterans, adult and larval flies, ants, sawflies, grasshoppers, bugs, lacewings, earwigs, damselflies, spiders, woodlice, sandhoppers, centipedes, snails, small earthworms, small fish and lizards; plant food includes seeds and blackberries (*Rubus*). Commonest prey item in Germany, based on 1758 faecal samples from adults and nestlings Mar–Oct, was beetles (43% adult, 37% nestling), followed by flies (21%, 13%), larvae of lepidopterans, craneflies and sawflies (8%, 19%), with bulk of remainder hymenopterans (of which two-thirds ants), adult moths and butterflies, and spiders. In various studies in China, stomachs held insects, mainly coleopterans, orthopterans and lepidopterans (including adult and larval small white butterflies *Pieris rapae*), also spiders, some plant seeds. In autumn and winter in Spain, 60 stomachs had high component of animal matter (88% by volume), mainly ants and beetles, mean prey size 6·65 mm in males, 6·55 mm in females); among fruits, olives (*Olea europaea*) most important for males, Solanaceae for females. Food brought to nestlings tends to involve more soft-bodied animals, depending on stage of nestling development. Of 1557 items brought to nestlings in Ireland, 81% comprised beetles, sawflies, ichneumons, bees, wasps, ants, terrestrial larvae (moth, sawfly, beetle), spiders and harvestmen. Of 121 nestling faeces in S England, 49% contained weevils (Curculionidae), 68% other beetles, 42% caterpillars and/or sawfly larvae, 39% moths and butterflies,15% hoverflies (Syrphidae), 46% other flies, 40% shieldbugs (Pentatomidae), 11% other bugs, 35% parasitic hymenopterans (e.g. ichneumons), 18% bees and wasps, 8% ants, 15% earthworms and 6% spiders (large broods given more hoverflies and fewer moths). Nestling diet in Kenya included small moths and their larvae, bush-cricket and grasshopper nymphs, glow-worms, small weevils, melolonthid beetles, termites, a butterfly, lacewing, small millipede and spider. Stomachs of 30 birds from throughout year in South Africa (Free State) held (in order of numerical importance) beetles, hymenopterans (mostly worker ants), termites, orthopterans, caterpillars, spiders and sun-spiders (Solifugae), seeds, myriapods and flies. Small lizards and woodlice also seen fed to young. Hunts mainly from low exposed perch in typical perch-and-pounce method, flying down to take prey on ground, often returning to same perch (in one study this used in 80% of observations); occasionally also sallies for aerial prey (9%), hover-gleans (6%), and flutter-pursues over some distance (5%). Relative proportions of foraging methods change with season; in Britain, uses exclusively perch-and-pounce in spring. In winter season, often accompanied by Dartford Warbler (*Sylvia undata*), with result that foraging efficiency drops by half, necessitating change of perch. Territories often maintained all year; pair territories commonly held in winter, but studies in Israel indicate that such pairs established by migrants highly unstable (frequent partner changes) and dissolve before or at spring departure.

Breeding. Mar to mid-Aug (mainly Apr to mid-Jul) in NW Europe, end Apr to late Jul from E Europe across Asia to Japan, but from mid-May in N Russia; Apr–Aug in Himalayas; Feb–Jun in Morocco, Mar in Senegal, Apr in Sierra Leone, Jan in Nigeria and Mar in Cameroon; Dec–Mar on Bioko; Aug–Sept in S DRCongo; Apr–May in Sudan and Ethiopia; Feb–Mar in Uganda, Jan–Jun (mainly Mar–May) in Kenya, Sept–Feb in N Tanzania and Aug–Nov in S Tanzania, Malawi and Zambia; Jul–Dec (mainly Aug–Nov) in Zimbabwe, Aug–Dec in South Africa and Sept–Dec in Lesotho; 2–4 broods in Europe, but single-brooded in sub-Saharan Africa. Male very occasionally pairs with two females, and a female once mated with four males in succession. Territory size in Swiss flower strips 0·3–0·8 ha and on coastal cliffs in Britain 0·3–1 ha, but larger in most areas, e.g. 0·8–4 ha on lowland heaths in Britain and 1–4·8 ha on uncultivated farmland strips in Netherlands; nests usually at least 150 m apart. Nest a loose deep cup of rootlets, grass, leaves and plant stems, lined with finer rootlets and sometimes hair, wool and feathers, placed on ground or in low bank, well hidden at base of tuft of herbage or in bottom of or under small bush (95% British nests below 30 cm); in Himalayas a pad of grass, hair and wool placed in hole in earth bank or under stone, often in pile of stones marking field boundaries. Eggs normally 4–6 (2–5 in sub-Saharan Africa, sometimes 7 in W Palearctic), bluish-green, variably spotted and freckled with reddish-brown; incubation period 14–15 days; nestling period 13–16 days; post-fledging dependence 3–4 months in Africa, 8–14 days in Europe in cases of first broods (and as little as 4–5 days between fledging and initiation of next brood). Nests in Palearctic parasitized by Common Cuckoo (*Cuculus canorus*). In Europe (Jersey), of 332 eggs in 61 clutches, 81% hatched, and 79% of hatchlings fledged, giving overall success 64%; for 122 eggs in W England corresponding figures 93%, 97% and 91%, and for 475 eggs in S England 81%, 73% and 59%. Of 97 eggs in 39 clutches in Kenya, 70% hatched and 58% produced fledged young; only five nests failed to produce fledged young and, probably related to this, change of mate (commonly associated with breeding failure) occurred in only seven of 34 pairs over 18 months. Causes of mortality among birds ringed in NW Europe are domestic predator 13%, human-related (accidental) 29%, human-related (deliberate) 34%, other 24%. Age of first breeding 1 year. Oldest ringed individual 6 years.

Movements. Sedentary, altitudinal migrant, partial migrant and migrant. W of line from Britain to Italy, also Balkans and C Turkey, populations sedentary or partial migrants, but Irish birds fully migratory and all other European breeders move S (passage in Spain from Sept, but mostly in Nov) and winter across N Africa in large numbers, with particularly strong representation near Algerian coast; many *rubicola*, *armenicus* and *variegatus* occupy N Africa chiefly Oct–Mar. In Tunisia most breeders appear to disperse into desert in winter. Numbers of juveniles wintering in Spain falls over time while numbers of adults stay constant, suggesting that juveniles move farther S. Those wintering commonly in C & E Mediterranean presumably originate in SE Europe and Turkey, and populations in Ukraine and W Caucasus may also move to E Mediterranean and Middle East. Race *variegatus* migrates through E Transcaucasia Sept and Mar and via Iraq and Arabia, recorded Eritrea mid-Sept to end Mar; *armenicus* winters across Iraq and Arabia into NE Africa. In Israel, *rubicola* a very common passage migrant, with peaks in Nov and Mar; *maurus*, *variegatus* and *armenicus* much rarer, but with essentially same dates; over winters with good rainfall numbers fairly constant, but with poor rainfall unpaired juveniles (high proportion of total) move out. In Jordan present mainly early Nov to mid-Mar. In UAE, *rubicola* fairly common winter visitor Nov to early Mar, with "*maurus* group" on irregular passage Sept and Apr, and similar pattern Bahrain. Scarce winter visitor in E Saudi Arabia late Aug to Feb (mainly from Oct), presumed *maurus*/*stejnegeri*, but passage of apparent *armenicus*/*variegatus* in Mar. Race *indicus* extensively penetrates Indian Subcontinent, reaching extreme S areas of winter range Oct–Feb, moving N and upslope over Mar–Apr. Race *przewalskii* apparently resident in much of lowland range, including SW China, although possibly a partial migrant in some regions, and in high W of range on Tibetan Plateau fully migratory, departing mid-Oct to E Himalayan foothills and returning mid-Apr. Race *stejnegeri* leaves Russian breeding grounds second half Aug but Korean Peninsula not until early Oct (return there late Mar), with passage in Japan late Sept and Oct (return mid-Apr to early May), wintering N India and Myanmar E to S China; main autumn passage at Beidaihe (NE China) mid-Aug to mid-Oct, occupying coastal SE China, Taiwan and Hainan mostly mid-Oct to end Mar or early Apr; stragglers reach Singapore, N Borneo and Sumatra. In tropical Africa appears to be sedentary, or vertical migrant (some breeding at 1000–2000 m in Malawi descend to 450 m), or short-distance migrant; birds breeding in Lesotho descend lower in winter but some disperse as far as E Zimbabwe; those from E South Africa move into S Mozambique; and in Sierra Leone more pairs noted at 1370 m on Mt Bintimani in Apr than in Nov, suggesting upward spring movement.

Status and Conservation. Not globally threatened. European population in mid-1990s estimated at 1,131,865–2,142,344 pairs, with additional 10,000–100,000 pairs in Russia and 10,000–100,000 pairs in Turkey; at that time Spain estimated to hold 300,000–700,000 pairs, although more recently a minimum of 283,798 pairs calculated. By 2000 total European population (including European Russia and Turkey) revised to 2,000,000–4,600,000 pairs, and considered increasing. In optimal habitat densities reach 1·5–2·5 pairs/ha (150–250 pairs/km², e.g. 179 pairs/km² on waste ground, Netherlands), but normally considerably lower, e.g. 33 pairs/km² in Spain (Asturias), 31·5 pairs/km² on coastal cliffs in Britain, 8–12 pairs/km² in Rheinland grassland in Germany, and only 2·8–9·6 pairs/km² on inland heathland in Britain. Since 1950s, breeding habitats in Europe have been reduced by agricultural intensification and withdrawal of grazing from littoral heaths, leading to severe population declines in Britain, Ireland, Netherlands and Germany, partly offset by increases in Carpathian basin in response to recent transition from cropfields to pastures. Conservation in Europe dependent on wide-scale measures to preserve habitat through promotion of non-intensive farming practices such as retaining scattered trees, bushes and hedges in fields, prohibition of afforestation schemes on moorland and heath, and retention of strips of old grass (mown every 3–4 years only) in intensively managed areas. In canton of Geneva, in Switzerland, strips of wild flowers established to conserve Grey Partridge (*Perdix perdix*) have greatly benefited present species. Outside Europe, status generally strong. Probably benefits from forest clearance in Africa and Madagascar. Scarce resident in N Tunisia. Very common in highlands of Itombwe Mts, in E DRCongo; common in E Africa. Common breeding species in Korean Peninsula and in N & C Japan. Fairly common resident from Myanmar E to N Vietnam, and fairly common to very common in winter throughout SE Asia.

Bibliography. Agatho (1960–1961), Ali (1977, 1996), Ali & Ripley (1987b), Ali *et al.* (1996), Andrews (1995), Anon. (2000a, 2004e), Austin (1948), Austin & Kuroda (1953), Barthel (1992), Bates & Lowther (1952), Baumgart *et al.* (1995), Beaman & Madge (1998), Benson (1960), Benson & Benson (1977), Benson, Brooke *et al.* (1971), Benson, Colebrook-Robjent & Williams (1977), Bijlsma (1978), Bonde (1993), Borrow & Demey (2001), Brazil (1991), Britton (1980), Brown & Britton (1980), Bueno (1991), Bundy (1976), Bundy *et al.* (1989), Caldwell & Caldwell (1931), Callion (2002a), Canoine & Gwinner (2002), Canoine *et al.* (2002), Carey *et al.* (2001), Cave & MacDonald (1955), Chapin (1953), Cheng Tsohsin (1964, 1987), Christy & Clarke (1994), Clancey (1961, 1980, 1996), Corso (2001), Courtenay-Latimer (1961), Cramp (1988), Cummins & O'Halloran (2002, 2003), Dean (2000), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dharmakumarsinhji (1955), Dittami & Gwinner (1985), Duckworth, Davidson & Timmins (1999), Eisentraut (1973), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Flinks (1994, 1999), Flinks & Pfeifer (1984, 1987a, 1987b, 1988, 1993), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Freitag (1943), Fujimaki *et al.* (1994), Fuller & Glue (1977), Gallagher & Woodcock (1980), Garland & Melville (1981), Gatter (1997), Ginn *et al.* (1989), Glenister (1971), Glutz von Blotzheim & Bauer (1988), Goodman, Meininger *et al.* (1989), Goodman, Pidgeon *et al.* (1997), Gore & Won Pyongoh (1971), Grant & Mackworth-Praed (1940a, 1946/47), Greig-Smith (1979b, 1980, 1982a, 1982b, 1982c, 1982d, 1983, 1984, 1985), Greig-Smith & Quicke (1983), Grimmett *et al.* (1998), Groebbels (1950), Gwinner & Neuzer (1985, 1995), Gwinner & Scheuerlein (1998, 1999), Gwinner, Dittami & Gwinner (1983), Gwinner, König & Haley (1995), Gwinner, Rödl & Schwabl (1994), Hagemeijer & Blair (1997), Harpum (1978), von Hecke (1965), Helm & Gwinner (1999, 2001), Herklots (1967), Hezekia (1987a), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Iida & Tanaka (1990), Illera (2003c), Inskipp & Inskipp (1991), Irwin (1981), Isenmann & Moali (2000), Jarry & Larigauderie (1971), Jennings (1995), Jeyarajasingam & Pearson (1999), Johnson (1961, 1971a, 1971b), Keith *et al.* (1992), Kinoshita (1997), Klaassen (1995), Koen (1988), König (1994), König & Gwinner (1995), König *et al.* (2002), Kopij (2003), Lardelli (1986), Ledant *et al.* (1981), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), Lewis & Pomeroy (1989), Louette (1981a, 1988, 2004), Lugrin (1999), MacKinnon & Phillipps (1993, 2000), Maclean (1993), Martens & Eck (1995), Martínez-Cabello *et al.* (1991), Medway & Wells (1976), Meyer de Schauensee (1984), Mildenberger (1950), Milon (1950), Milon *et al.* (1973), Morel & Morel (1990), Moreno (1984b), Morris & Hawkins (1998), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Parker (1999), Parrinder & Parrinder (1945), Paz (1987), Penry (1994), Pérez del Val (1996), Pfeifer (2000), Piechocki *et al.* (1982), Porter *et al.* (1996), Prigogine (1971), Rand (1936), Rasmussen & Anderton (2005), Reusch (2001), Richardson (1990), Roberts (1992), Robertson (1977), Robson (2000), Rödl (1994, 1999), Rödl & Flinks (1996), Roselaar (1995), Roy (1948–1949), Scheuerlein & Gwinner (2002), Scheuerlein *et al.* (2001), Schwager & Güttinger (1984), Schweizer (2003), Shirihai (1996), Sinclair & Ryan (2003), Smythies (1986, 1999), van Someren (1956), Sowerby (1943), Starck *et al.* (1995), Tarboton *et al.* (1987), Thévenot *et al.* (2003), Thompson & Evans (1991), Thomsen & Jacobsen (1979), Tomek (2002), Tomialojc (1994c), Urquhart (2002), Wikelski *et al.* (2003), Williams (2000), Wilson (1987), Wink *et al.* (2002), Wittmann *et al.* (1995), Zamora *et al.* (1992), Zheng Guangmei & Zhang Cizu (2002), Zimmerman *et al.* (2003).

292. Fuerteventura Stonechat

Saxicola dacotiae

French: Tarier des Canaries **German**: Kanarenschmätzer **Spanish**: Tarabilla Canaria
Other common names: Canary Islands Stonechat/Chat, Meade-Waldo's Chat

Taxonomy. *Pratincola dacotiae* Meade-Waldo, 1889, Fuerteventura, Mauritanice Dacos, Canary Islands.
Has been treated as a race of *S. torquatus*, from which evidently derived, but level of morphological distinctiveness sufficient to warrant full species status. Individual variability high; named race *murielae*, based on specimens collected in Jun 1913 on Montaña Clara and Alegranza (both off N Lanzarote), appears to fall within range of variation of Fuerteventura population. Monotypic.
Distribution. Fuerteventura, in E Canary Is.



Descriptive notes. 11–12·5 cm. Male has blackish head and face with narrow white supercilium, broader white half-collar extending to white chin, greyish rump, remaining upperparts as *S. torquatus*, small area of rufous-orange on breast, shading to almost all-white underparts; in fresh plumage browner above, with less clear-cut or less extensive white, rump pale greyish-brown, more diffuse and paler rufous-orange below; bill and legs black. Female is blackish-streaked dark brown above, with greyish rump, buffy supercilium often rather weak, underparts creamy-buff; in fresh plumage paler and greyer above, buffier below, with yellowish-brown rump. Juvenile resembles fresh-plumaged female, with buff streaking above, black stippling on breast. Voice. Song, by male, very similar to that of *S. torquatus*, a scratchy "bik-bizee-bizeeu" and variants; in song flight switching to combination of mellow lark-like "liu" and loud rasping "screeiz", "liu-liu-liu screeiz". Calls include thin high "seit" or "sueet" in contact-alarm, harsh "chup" in greater anxiety, and combination of the two when nest at risk; in extreme anxiety a quiet rasping.
Habitat. Rocky hillsides with shrubby vegetation cover, typically of aulaga (*Launaea arborescens*), saltwort (*Salsola vermiculata*) and box-thorn (*Lycium intricatum*), also the succulent spurge *Euphorbia obtusifolia*, tobacco (*Nicotiana glauca*) and ragwort (*Senecio kleinia*); also fringes of vegetated *malpaís* (lava flows), dry and flowing *barrancos* (watercourses) fringed with tamarisk (*Tamarix*) and other plants, cultivated areas, old fields and gardens. Spends all foraging time on stony fields and *barrancos*, avoiding lava and sandy fields; slopes with higher levels of shrub coverage are best predictors of occurrence at landscape scale, while at micro-habitat scale slopes with large boulders selected and those covered with small stones avoided. Thus, in 1985, vegetation covered 18% of ground in occupied habitats but only 10–15% of ground in unoccupied control areas.
Food and Feeding. Invertebrates, including caterpillars, ants, ichneumon flies, flies, centipedes, beetles and spiders. Food brought to nestlings includes grasshoppers, adult lepidopterans and flies. Forages in typical perch-and-pounce method, flying from low perch (bush, wall, rock, even rooftop) to ground; also sallies in air after flying insects, and hops and runs over ground in pursuit of prey.
Breeding. Linked to timing and extent of winter rains, sometimes as early as Jan but mainly mid-Feb to late Mar, with dependent young as late as late May; double-brooding rare, perhaps only in wet winters/springs. Some evidence for co-operative breeding, with extra male or female helping at nest and in escorting of fledged young. Nest a firm cup of plant stems and roots, incorporating much *Salsola*, lined with goat hair, placed on (usually sloping) ground among stones and rocks, in cactus thicket, under shrub (*L. intricatum*) or bushy grass clump, or low down (below 0·5 m) in wall or side of *barranco*, often sheltered by overhanging stone or bush. Eggs 2–5, usually 4, pale blue-green with fine reddish-brown speckling or mottling; incubation period 13–15 days; nestling period 16–18 days; post-fledging dependence unreported, but in one case second-brood eggs hatched only 23 days after previous brood fledged. Of 12 broods in 1979, mean size 1·8 young; of 47 broods in 1986, mean 2·3.
Movements. Apparently sedentary. Old (1913) reports of individuals from islets of Alegranza and Montaña Clara (N of Lanzarote), if genuine, may involve dispersal from Fuerteventura following population build-up after series of summers with high breeding success; it is known that numbers were low and areas of Fuerteventura unoccupied in 1902–1904, but that species was at very high density by 1914.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Madeira and the Canary Islands EBA. On basis of evidence in the literature and results from expedition in 1979, population judged to be 50–150 pairs in 1985, but in that year a detailed survey resulted in estimate of 650–850 pairs, and subsequent observations suggested that even this may have been unduly cautious; latest global population estimate revised to 1300 pairs, but considered in decline. Possible that population fluctuates according to degree of vegetation cover, so that several years of drought may depress numbers, while successive years of good rain inflate them. Continuing desertification through water extraction for increasing human population, grazing by domestic livestock, and various often extensive construction works (for tourist industry) now judged to be having negative impact locally. Future management should aim to protect large patches of stony field and *barranco* habitats, with slopes having at least 50% of shrub cover and large boulders; rigorous studies needed to ascertain maximum level of goat grazing for maintaining these optimal habitats. Four introduced mammals possibly also have adverse impact, into which research is needed: domestic cats may restrict numbers near villages, while rats (*Rattus rattus*), vagrant hedgehogs (*Erinaceus algirus*) and North African ground squirrels (*Atlantoxerus getulus*) may despoil nests. Categorized as "Endangered" on Spanish national list. View that a breeding population existed on Alegranza and/or Montaña Clara (N of Lanzarote) until 1913 disputable, and considered unproven.
Bibliography. Anon. (2004e), Bannerman (1914, 1919–1920, 1922, 1963), Beaman & Madge (1998), Bibby & Hill (1987), Collar & Stuart (1985), Collins (1984), Cramp (1988), Étchécopar & Hüe (1964), Illera (2001, 2003b), Keith *et al.* (1992), Löhrl (1987), Meade-Waldo (1889a, 1889b, 1893), Müller (1999), Phillips (1986), Polatzek (1908–1909), Shirt (1983), Stattersfield & Capper (2000), von Thanner (1905, 1908, 1910), Urquhart (2002).

293. Reunion Stonechat

Saxicola tectes

French: Tarier de la Réunion **German**: Réunionschmätzer **Spanish**: Tarabilla de Reunión

Taxonomy. (*Muscicapa*) *tectes* J. F. Gmelin, 1789, *in insula* Bourbon = Reunion Island.
Often treated as a race of *S. torquatus*. Monotypic.
Distribution. Reunion I.



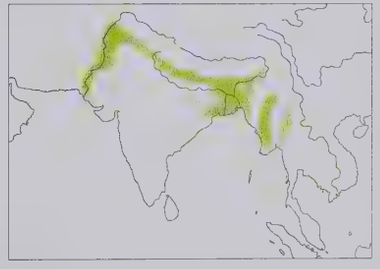
Descriptive notes. 12·5 cm; 11–14 g. Highly variable, most closely resembling *S. dacotiae* in all plumages. Male may have all-black head (no white supercilium), and shows much variation in amount of rufous-orange on breast. Even during breeding, male can closely resemble female. Female is darker above than female *S. dacotiae*, with more obvious buff supercilium, slightly darker below. Juvenile is more heavily mottled below. Voice. A "loud and distinctive" song, either from perch or during vertical flight a few metres above ground. Call a vigorous, repeated series of grinding, metallic notes, "tek, tek".
Habitat. Range of habitats with open understorey, from scrub to woodland. Commonest in tamarind and mixed evergreen forest with open meadows and clearings; also common in closed-canopy forest, any kind of secondary vegetation and *Philippia* heath, becoming less so as heath gives way to grassland at higher altitudes, and scarce around the Volcan. Also scarcer in *Cryptomeria*, introduced gorse scrub, and very scarce in cloudforest on E of island; occasionally occurs in gardens. Above 800–900 m in N and NE of island, from 300 m in S; commonest above 1200 m.
Food and Feeding. Almost exclusively small invertebrates, including caterpillars and other larvae. Stomachs of two nestlings contained butterflies and caterpillars, beetles and their larvae, flies, spiders, seeds and plant fibres. Hawks flying or terrestrial insects from rock, low branch, or heath bush. Prey usually taken from ground, but also from foliage or rocks; sometimes gleans leaves. May also hop along ground in search of prey.
Breeding. Mid-Oct to late Jan. Nest made of mosses, leaves, stems and animal hair, placed either on ground, in tuft of vegetation or on vegetated bank, or 1–2 m above ground on low bough or in crevice within trunk. Eggs 2–4 (usually 2–3), pale blue-green or, rarely, cream, with fine brown spots; incubation period probably 14 days; nestling period probably 13–15 days. Of 11 nests, at least six produced fledged young.
Movements. Occasionally moves to lower altitudes (0–130 m) outside breeding season; also recorded up to 3069 m (Piton des Neiges), where unlikely to breed.
Status and Conservation. Not globally threatened. Restricted-range species: present in Réunion EBA. Common, and tolerant of degraded or overgrazed country; commonest bird in tamarind plantations. Population size estimated at 180,000 in 1983, and "well over a hundred thousand pairs" in 1987. Nesting density in representative habitat at Plaine des Chicots nearly 2/ha.
Bibliography. Barré (1983), Barré & Barau (1982), Barré *et al.* (1996), Berlioz (1946), Cheke (1975, 1987b), Cheke & Jones (1987), Milon (1951a), Stattersfield *et al.* (1998), Urquhart (2002).

294. White-tailed Stonechat

Saxicola leucurus

French: Tarier à queue blanche **Spanish**: Tarabilla Coliblanca
German: Weißschwanz-Schwarzkehlchen
Other common names: White-tailed Bush Chat, Black Stonechat

Taxonomy. *Pratincola leucura* Blyth, 1847, upper Sind, Pakistan.
Has been treated as conspecific with *S. torquatus*, and particularly similar to race *indicus* of latter; further study required. Monotypic.
Distribution. Pakistan and N India E to Bangladesh and Myanmar.



Descriptive notes. 12–14 cm. Both sexes very like equivalent sexes of *S. torquatus* (race *indicus*), but smaller. Male has white inner webs on all rectrices apart from central pair, breast patch darker and less extensive. Female is paler, with whitish throat, buffy edges of wing-coverts, buffy inner webs of rectrices. Juvenile has tail like adult's, but otherwise is virtually identical to juvenile *S. torquatus*. Voice. Apparently not differentiated from that of *S. torquatus*. Song, sometimes in short flight during descent phase, a brief, repetitive and lark-like series of rather similar phrases, each phrase comprising rapid squeaky scratchy notes that fall and rise several times, usually ending on high slurred note. Calls include short "peep-chaa" in alarm, hard dry "kek-kek-kek" in warning, and a "pseep".
Habitat. Tall grass and reeds near large rivers, and apparently confined to areas liable to seasonal inundation. In Pakistan dependent on areas of extensive *Saccharum spontaneum* elephant grass and *Typha* reedbeds. In Myanmar typically also in *Saccharum* grass, also crops such as maize, peas, tomatoes and tobacco grown on riverine banks and islands.
Food and Feeding. Insects, taken in typical manner in flights to ground from stems of tall grass; also makes aerial sallies, e.g. for swarming culicids and chironomid midges.
Breeding. Mar–May, before summer floods; Feb–Mar in Myanmar; possibly single-brooded, owing to monsoon flooding. Nest a small neat cup of grass, moss and leaves, usually lined with hair or fur, concealed on ground in tangled mass of grass or roots (especially tamarisk) close to water; one was at end of tunnel in heap of straw. Eggs 3–5, pale greyish-blue with pale reddish spots. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Locally common throughout range. Four nests within area of 1 km², but presumably capable of higher density in appropriate habitat. In Pakistan populations have greatly diminished following habitat loss due to agricultural improvements and flood control, but species still survives in adequate numbers along main tributaries of R Punjab and throughout R Indus riverain tracts.
Bibliography. Ali (1996), Ali & Ripley (1987b), Baral (2004), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Rasmussen & Anderton (2005), Roberts (1992, 1996), Robson (2000), Roy (1948–1949), Smythies (1986), Thompson *et al.* (1993).



PLATE 78

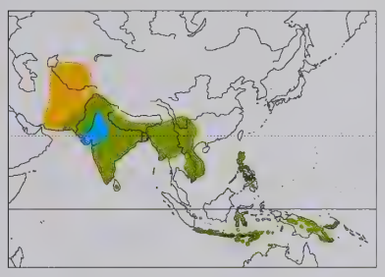
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295. Pied Bushchat

Saxicola caprata

French: Tarier pie **German**: Mohrenschwarzkehlchen **Spanish**: Tarabilla Pía
Other common names: Pied Chat; Black Bushchat (*aethiops*)

Taxonomy. *Motacilla Caprata* Linnaeus, 1766, Luzon, Philippines.
It has recently been suggested that distinctiveness of female plumages of various insular populations of races *fruticola* and *pyrrhonotus* may warrant naming of additional races, but differences appear slight and possibly due to individual variation or age factors. Sixteen subspecies currently recognized.
Subspecies and Distribution.
S. c. rossorum (Hartert, 1910) – NE Iran SC Kazakhstan S to Afghanistan; non-breeding SW Asia (vagrant Arabia, Israel).
S. c. bicolor Sykes, 1832 – SE Iran, Pakistan and N India; non-breeding C India.
S. c. burmanicus Stuart Baker, 1922 – C & SE India E to Myanmar and S China (S Sichuan, Yunnan), S to Thailand and Indochina.
S. c. nilgiriensis Whistler, 1940 – SW India.
S. c. atratus (Blyth, 1851) – Sri Lanka.
S. c. caprata (Linnaeus, 1766) – Luzon and Mindoro, in N Philippines.
S. c. randi Parkes, 1960 – C Philippines (Panay, Negros, Cebu, Bohol, Siquijor).
S. c. anderseni Salomonsen, 1953 – Leyte and Mindanao, in E & S Philippines.
S. c. fruticola Horsfield, 1821 – Java E to Flores and Alor.
S. c. francki Rensch, 1931 – Sumba I.
S. c. pyrrhonotus (Vieillot, 1818) – E Lesser Sundas (Wetar, Kisar, Timor, Savu, Roti).
S. c. albonotatus (Stresemann, 1912) – Sulawesi (except N peninsula) and Salayer I.
S. c. cognatus Mayr, 1944 – Babar I.
S. c. belensis Rand, 1940 – WC New Guinea.
S. c. aethiops (P. L. Sclater, 1880) – N New Guinea and Bismarck Archipelago.
S. c. wahgiensis Mayr & Gilliard, 1951 – EC & E New Guinea.



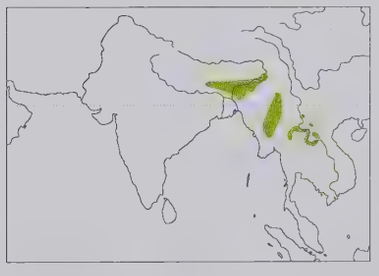
Descriptive notes. 13–14 cm; 14–26 g. Male nominate race is glossy black, with long white wing-covert patch, white rump, white belly centre to vent; in fresh plumage lightly scaled buff; bill and legs black. Female is grey-brown above, with dark brown wings and tail, unstreaked rufous rump, paler below, with dark brown streaking; in fresh plumage paler and streakier above, with buff edges of wing-coverts. Juvenile is like female, but with strong buff spots and streaks above, scaling on breast and flanks, two rufous wingbars; male has partial white wing patch. Race *rossorum* male has white below extending forwards to mid-breast, female with more white below and no streaks; *bicolor* is larger and male less glossy than nominate, with white below extending up to lower belly; *burmanicus* is like nominate, but male with slightly more white below, female darker above; *nilgiriensis* male has smaller wing patch, female dark and heavily streaked; *atratus* is larger and longer-billed than nominate, male matt black and with some white ventrally, female like last; *randi* is like nominate, but with white tips on axillaries, female darker than nominate, with white throat and more heavily streaked underparts; *fruticola* male resembles previous, female is colder and often greyer below with more extensive streaking (populations on different islands vary in shading), whitish vent and tail-coverts; *anderseni* male is like nominate, female paler with greyish-white throat; *pyrrhonotus* male has white axillary tips, female is rufous-brown overall and unstreaked below (apparently variable from Timor to Kisar and to Savu); *francki* is similar to last, but female more grey-brown; *albonotatus* male has black fringes on white wing patch, female has dark-fringed white wing patch, dark-streaked whitish-grey underparts, white underwing-coverts; *cognatus* male has white axillary tips, female is dark brown overall with darker streaking, white rump and vent; *aethiops* male is glossier black, with dark-fringed wing patch, female white on rump and vent, with smaller wing patch; *belensis* is very like previous but larger, female darker, more weakly marked, no white wing patch; *wahgiensis* is doubtfully distinct from last but smaller, female paler, especially below. Voice. Song, from perch, occasionally in parachuting flight with slow wingbeats (white axillaries and rump fluffed out), a series of very short, hesitantly started but attractive whistled phrases (sometimes with harsh ending), each repeated several times before changing to another, recalling song of *Saxicoloides fulicatus* or weak, high version of *Turdus merula*, "hiu-hiu-hiu u'wee'wipee'chiu" or "chip chepee-cheweechu" ("it's a wonderful day!"); each phrase lasts c. 1 second, with interval of 5–10 seconds, although on Sumba (race *francki*) each phrase 5·5 seconds long. Calls include plaintive "hweet" or "seeye" and insistent scolding "tsak-tsak" or "chek-chek", the two often combined, also scolding sharp "chuh" and a clear whistled "hew" or sharp downslurred clipped "spleeu, spleeu".
Habitat. Open terrain with some low to mid-height vegetation (singing from trees as high as 20 m, New Guinea), scrubby open grassy country and hillsides, willow plantations, riverbeds with scant bushes, anthropogenic grassland, grassy steppe, dwarf palms, savanna, scrub jungle, rushes beside jheels, moist ground with thickets near reedbeds, tamarisk (*Tamarix*) and tall grass clumps along rivers, *Agave* hedges, abandoned pastures and terraces, paddocks, road cuts, often near cultivation and villages. In Pakistan favours rather treeless fields and patches of waste ground with clumps of *Saccharum* grass, but occurs in juniper forest up to 2400 m and subtropical pine *Pinus roxburghii* in Azad Kashmir. From sea-level to 2400 m in Himalayas, only above 1200 m in Sri Lanka; to 1600 m in Thailand; 0–400 m in N Philippines (Sierra Madre); mainly at 600–1100 m in Sulawesi; 1200–2400 m on Lombok, lowlands to 800 m on Sumbawa, to 950 m on Sumba, to 1600 m on Flores and to 2000 m on Timor; in New Guinea mainly at sea-level and again at 1200–2400 m. Prime requirements for territory in New Guinea judged to be presence of bare stony ground, and sparse tree cover but with some singing perches available.
Food and Feeding. Small insects and their larvae, including beetles, caterpillars, moths, midges and ants, also earthworms; once seen with berry in bill. Small caterpillars seen brought to nestlings. Forages in typical stonechat fashion, flying from perch (e.g. tall grass or top of low bush) to ground to take prey; occasionally sallying in air, in New Guinea this apparently commonest method, at least in late afternoon when flying insects numerous. Once seen to take worms and other invertebrates in wake of rootling domestic pig. Female vagrant held territory 0·07 ha (35 × 20 m).
Breeding. Apr–Jun in Afghanistan and C Asia, Mar–May and Jul–Aug in Pakistan, Feb–May in India and Apr–Jun in Sri Lanka; Mar–May in Myanmar; Mar–Jun in Philippines; Dec in Sulawesi; Apr–Dec in Java; nest-building and food-carrying Nov and fledglings Dec–Feb on Timor, and nest Oct on adjacent Roti; Jul–Nov (mainly Oct–Nov) on Flores; mainly Aug–Jan in New Guinea, also Jun (Port Moresby area), and Mar–Nov in highland provinces; Sept-Jan in E New Britain; double-brooded probably throughout range, one record of three broods. Nest a pad of coarse soft grass, roots and leaves, lined with fine roots, vegetable down, hair or wool, placed in hole in ground or bank, in hollow of bamboo, shelter of grass tussock, deep hoofprint of cow, or even under roof or in drainpipe; nest reused for subsequent broods. Eggs 3–5 (mainly 2–3 in Philippines, Java and New Guinea, 2–4 in Sri Lanka), pale bluish-white to greenish-white with reddish-brown to earth-brown speckles and blotches, sometimes plain; incubation period 13–14 days; nestling period 13–15 days; post-fledging dependence c. 30 days. Frequent brood parasitism by Common Cuckoo (*Cuculus canorus*) in Pakistan and Myanmar. Breeding success, New Guinea, from egg to fledging 40%, with 58% hatching success and 70% nestling success; nests frequently robbed by *Calotes versicolor* lizards.
Movements. Largely migratory in W of range; resident in E. Populations from Transcaspia, E Iran and Afghanistan move S & E, autumn movement in Afghanistan Sept–Oct; winter mainly along coast and hinterland of SE Iran to NW Pakistan; spring passage in Turkmenistan early Apr, reaching upland Tadjikistan early May. On Indus Plains, in Pakistan, local winter movements and considerable summer immigration into warm dry mountain areas, arriving Mar, departing Sept; cold-weather immigrant into NW India, where arrives Sept and departs Mar. Apparently at least partly an elevational migrant in Myanmar, wintering in plains and breeding in hills.
Status and Conservation. Not globally threatened. Common at low elevations, Afghanistan, and in many parts of Central Asia. Common in Indian Subcontinent, locally abundant in N; common in grassy areas in hills, Sri Lanka. Common in many parts of Myanmar, and common in Thailand. Locally common in Philippines. Fairly common in Java and Bali and in C Sulawesi, and locally throughout Lesser Sundas, and sometimes very common, e.g. on Lembata. In New Guinea, fairly common in N coastal lowlands and common in secondary grassland in mid-mountains, and in Eastern Highlands; expanding range in New Guinea with clearance of forest and development of roads, airfields, quarries, gravel pits and drainage systems. Locally common in E New Britain (Bismarck Archipelago).
Bibliography. Ali (1996), Ali & Ripley (1987b), Bates & Lowther (1952), Beaman & Madge (1998), Beehler *et al.* (1986), Bell & Swainson (1985), Cheng Tsohsin (1987), Coates (1990), Coates & Bishop (1997), Colston & Gallagher (1984), Cramp (1988), Danielsen *et al.* (1994), Deignan (1945), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dharmakumarsinhji (1955), Diamond (1972), Dickinson *et al.* (1991), Duckworth, Davidson & Timmins (1999), Finch (1985), Flint *et al.* (1984), Grimmett *et al.* (1998), Hadden (1975), Harrison (1999), Henry (1998b), Hoffmann (1998), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Kennedy *et al.* (2000), Legge (1983), Lekagul & Round (1991), MacKinnon (1988), MacKinnon & Phillipps (1993, 2000), Martens & Eck (1995), Mayr & Rand (1937), Meyer de Schauensee (1984), Noske (2003), Paludan (1959), Porter *et al.* (1996), Rand (1942), Rand & Gilliard (1967), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Roy (1948–1949), Smythies (1986, 1999), Stresemann & Heinrich (1940), Thonglongya (1966), Verheijen (1964), Watling (1983a), White & Bruce (1986), Yosef & Rydberg-Hedaen (2002).

296. Jerdon's Bushchat

Saxicola jerdoni

French: Tarier de Jerdon **German**: Jerdonschmätzer **Spanish**: Tarabilla de Jerdon

Taxonomy. *Oreicola jerdoni* Blyth, 1867, Purnia, Bihar, India.
Monotypic.
Distribution. Locally NE India, Bangladesh, Myanmar, N Thailand and N Indochina.



Descriptive notes. 15 cm. Male is glossy blue-black from head, including ear-coverts, to tail; white below, in fresh plumage tinged buffy; bill and legs black. Female is rufous-brown above, with dark brown wings and tail, rufous-edged wing-coverts and secondaries, rufous-chestnut rump; white on throat, becoming buffy on breast and tinged rufous on flanks. Juvenile is like female, but with buffy-rufous streaks above, more stone-white below, with brown-stippled breast. Voice. Song a series of sweet, clear, thin mellow warbled phrases, recalling a *Sylvia* warbler but without any harsh or churring notes, and often ending with rapidly trilled flourish. Calls include loud high nasal downslurred whistle, "heeeew"; short, plaintive, rather high whistled rasp, "chirr" or "chit-churr", in alarm; and high dry rapid ticking.
Habitat. Tall grassland in lowlands, plains and hills, cleared land with rocks and tall herbs, rice fields, scrub-dominated seasonally inundated riverine islands; generally to 700 m, but reaching 1500 m in Laos. Typically in high *Saccharum* elephant grass and mid-height *Imperata* thatch-grass areas in Myanmar and Laos; in Laos, also partial to patches of *yezi* or wild briar (*Rosa bracteata*) on sandy riverine islands.
Food and Feeding. Insects. Forages in typical stonechat fashion, perching on grass stem or other prominent low perch and flying to ground to take prey.
Breeding. Feb–May in India; May in Myanmar; singing males in Mar and breeding-condition female May in Laos. Nest a stout compact cup of rootlets and fibres, lined with fine grass and feathers, placed on ground in thick grass among roots or in hole in bank. Eggs 2–4, rarely 2, normally 4, deep turquoise-blue, occasionally with speckling. No other information.
Movements. Generally sedentary. Some local movement in SE Asia; population at Nam Sang–Mekong river confluence, in Laos, must disperse, as area is inundated in rainy season. Rare visitor in Nepal.
Status and Conservation. Not globally threatened. Very sparse in most of range, of which Laos appears to be centre. Formerly common in appropriate habitat in NE India, but very few recent records, probably reflecting extensive modification of habitat. Only a handful of records from Nepal and Bangladesh. Always considered rare in Myanmar, although locally common in a few areas associated with broad river valleys and at L Inle. Rare in Thailand, where found only in N but reported sightings from C & S; very few records from Vietnam (E Tonkin). In Laos at least formerly common in N (Tranninh), and dense population of 100–200 pairs exists on 6 km² of sedimentary deposits at confluence of R Nam Sang with R Mekong (3–6 ha/pair), and is probably secure owing to area being

On following page: 297. Grey Bushchat (*Saxicola ferreus*); 298. White-bellied Bushchat (*Saxicola gutturalis*); 299. Buff-streaked Chat (*Campicoloides bifasciatus*).

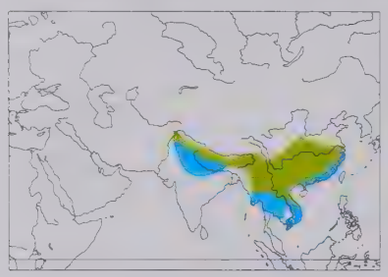
seasonally flooded; moreover, the species' occurrence in various areas of secondary grassland generated by prolonged cultivation and over-burning suggests that it is at little risk in the country.
Bibliography. Ali (1996), Ali & Ripley (1987b), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Duckworth (1997), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Roy (1948–1949), Smythies (1986), Thewlis *et al.* (1998).

297. **Grey Bushchat**

Saxicola ferreus

French: Tarier gris **German**: Grauschmätzer **Spanish**: Tarabilla Gris
Other common names: Dark-grey/Iron-grey Bushchat

Taxonomy. *Saxicola ferrea* J. E. Gray and G. R. Gray, 1847, Nepal.
Difference in egg pattern between races adduced as evidence for taxonomic reassessment of species, but split seems unlikely. Racial variation largely clinal, plumage becoming darker from W to E. Two subspecies recognized.
Subspecies and Distribution.
S. f. ferreus J. E. Gray & G. R. Gray, 1847 – Himalayas E to Myanmar, N Thailand and C Vietnam; non-breeding N India, S Myanmar E to S Indochina.
S. f. haringtoni (Hartert, 1910) – C & S China; non-breeding S China and Indochina.



Descriptive notes. 14–15 cm; 14–16 g. Male nominate race is like male *S. jerdoni*, but with long white supercilium, grey-fringed back, rump and scapulars, small white wing patch, white outer-tail feathers, grey-washed breast; in fresh plumage, crown to rump mid-grey with vague dark streaks, face blackish, wing-feather edges grey. Female has crown to rump and scapulars rufous-brown, rufous-buff wing edgings, rufous-chestnut rump and outer tail, buffy supercilium and throat, blackish-brown face, buff underparts tinged rufous on flanks. Juvenile is very like juvenile *S. jerdoni*, but has short buffy supercilium and wingbar. Race *haringtoni* male is darker on breast and flanks, less pure grey above, female darker overall. Voice. Song, from often high exposed perch (e.g. in pine), a short, variable, pleasant but feeble canary-like trill, e.g. "titheratu-chak-lew-titatit" or "sisiri-swirrr", ending abruptly on rising inflection. Calls include characteristic soft "zizz" sound in warning (birds then described as "geezing"); clear "hew" or "tyoup"; harsher "bzech"; sharp "tak-tak-tak-tak" and, in greater alarm, "zee-chunk" (probably versions of foregoing calls).
Habitat. Open scrubby and bush-covered hillsides, glades, grassy knolls by trees, edges of pine and broadleaf evergreen forest, nearly treeless terraced agricultural land, gardens, weed-covered fields, low hedgerows, bamboo jungle along mule roads. In Himalayas breeds at 1500–3300 m, wintering in similar habitat, also parks and gardens, from lowlands to 2400 m; breeds above 1600 m in NW Thailand.
Food and Feeding. Chiefly insects, including beetles and grasshoppers, also spiders and small molluscs; occasionally seeds. Feeding habits typical of genus, flying down from conspicuous perch to take prey on ground, but also sallies in air. Commonly perches in trees, as well as on lower features. Territorial in winter.
Breeding. Mar–Jul; probably double-brooded. Nest a modest compact cup made of grasses, moss and fine roots, lined with fibrous material, hair, feathers, pine needles and rootlets, usually placed on ground or in hole in bank or wall or amid roots or ferns. Eggs 4–6, pale bluish to greenish-blue with faint reddish freckles (reportedly unmarked in race *haringtoni*). Often parasitized by Common Cuckoo (*Cuculus canorus*). No other information.
Movements. Resident, subject to altitudinal and short-distance winter movements, in much of range. Straggles down to foothills and adjacent plains in Pakistan, and moves into Mandalay district of Myanmar; local movements in Thailand E to N Vietnam. Elsewhere more migratory. Race *haringtoni* winters into S China (scarce in Hong Kong, mainly from early Oct to late Feb) and SE Asia, straggling to Japan and Taiwan; in E China, autumn passage in lowland Fujian mid-Oct, common in winter until Apr. In Vietnam, recorded as appearing "in large groups" in winter in 1960s.
Status and Conservation. Not globally threatened. Common in greatly restricted range in Pakistan and common through much of Himalayas. Pairs every few hundred metres in agricultural terraces in Nepal (highest density encountered there). Fairly common in C & S China; once thought rare in S China, but now known to be rather common. Common in higher hills in Myanmar; local in NW Thailand. Generally common in non-breeding range in SE Asia.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Deignan (1945), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Grimmett *et al.* (1998), Herklots (1967), Inskipp & Inskipp (1991), Lee Woo-Shin *et al.* (2000), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Roy (1948–1949), Saha & Datta (1979), Smythies (1986), Vaurie (1955b, 1972), Wildash (1968), Zheng Guangmei & Zhang Cizu (2002).

298. **White-bellied Bushchat**

Saxicola gutturalis

French: Tarier à gorge blanche **German**: Timorschmätzer **Spanish**: Tarabilla de Timor
Other common names: White-bellied Chat, Timor Bushchat

Taxonomy. *Oenanthe gutturalis* Vieillot, 1818, New Holland; error = Timor.
Possibly closest to *S. ferreus*, but behaviour and ecology suggest that it may merit separate generic placement. Two subspecies recognized.
Subspecies and Distribution.
S. g. gutturalis (Vieillot, 1818) – Timor, and probably Roti I.
S. g. luctuosus Bonaparte, 1850 – Semau I, off SW Timor.
Descriptive notes. 15·5–17 cm. Male is like male *S. jerdoni*, but with large white wing patch and white bases of outer tail, sometimes also short white supercilium over ear-coverts. Female is like female *S. ferreus*, but face less dark, wings with buffy fringes, underparts all creamy-buff. Juvenile apparently undescribed. Race *luctuosus* male has less white in wing and tail than nominate. Voice. Song, by male from dense canopy of tall trees, a series of clear sweet unhurried phrases, each consisting of 4–5 fairly high whistled notes, the first long and upslurred, next 3–4 deliberate and alternating up and down scale, the whole lasting c. 2·1 seconds with intervals of 6–14 seconds. Calls include subdued "tchk-tchk" from female.



Habitat. Monsoon forest and scrubby savanna, up to 1200 m. Found even in very small remnant pockets of woodland, but largely excluded from savanna and open scrub by *S. caprata*.
Food and Feeding. Insects. Forages by gleaning and sallying in canopy and sometimes in tall understorey shrubbery; very similar in posture and movements to a *Myiagra* flycatcher.
Breeding. Oct–Nov, with immatures Jan–Feb but also May–Jun. Nest in one instance 5·5 m up inside dead hollow branch (0·7 m long) of 15-m *Eucalyptus*. Two fledglings seen elsewhere suggest that clutch size may be only 2 eggs. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Restricted-range species: present in Timor and Wetar EBA. Locally common. Forest loss, at least in West Timor, has been extensive, especially in lower-lying areas, and total population may not be large.
Bibliography. Coates & Bishop (1997), Johnson & Stattersfield (1990), Johnstone & Jepson (1996), Noske (2003), Stattersfield & Capper (2000), Strange (2001), White & Bruce (1986).

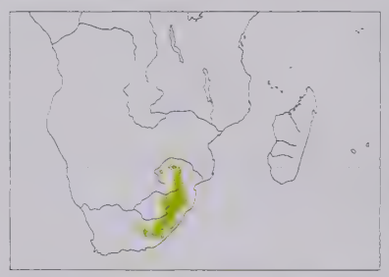
Genus *CAMPICOLOIDES* Roberts, 1922

299. **Buff-streaked Chat**

Campicoloides bifasciatus

French: Tarier bifascié **German**: Fahlschulterschmätzer **Spanish**: Tarabilla Sudafricana
Other common names: Buff-browed Chat

Taxonomy. *Saxicola bifasciata* Temminck, 1829, eastern Cape Province, South Africa.
Suggested as being a relict of a uniquely African radiation, with no extant close relatives. Affinities to *Saxicola* and *Oenanthe* evident, and has been treated in both, but plumage, size, nest position, egg colour and song behaviour distinctive; placement in its own monotypic genus currently considered the most appropriate treatment. Monotypic.
Distribution. South Africa (C & S Northern Province S to KwaZulu-Natal and Eastern Cape), W Swaziland and Lesotho.



Descriptive notes. 16–17 cm; 33–37 g. Male has broad buff-white line from over bill along supercilium and down rear ear-coverts to scapulars; crown to nape dark brown, streaked paler, becoming brown-mottled on mantle; rump and uppertail-coverts variable (age-related), white to light orange-buff; blackish wings and tail; face to neck side and breast black, lower breast and belly rich tawny-buff, fading paler to undertail-coverts; bill and legs black. Female is dark brown from crown to back and on face, with darker wings and tail, buffy-orange rump, dull buff supercilium, dull orange-buff throat to vent and edges of wing-coverts and secondaries. Juvenile is dark brown above, spotted and streaked rufous-buff, with buff-orange rump, dull buff-orange with dark scaling below, becoming plain yellowish-buff on belly to vent; first-year male buffier below than adult (may breed in this plumage). Voice. Song, by both sexes at all seasons (quieter when not breeding), a series of short phrases, each 2–6 seconds long with 2–10 seconds' pause, each consisting of one or more "chack" notes followed by several whistled, trilled or harsh notes, "klitick tweeoo, trrpeetoo (pause), klitick tritri tweeooo, tritritri" etc.; sometimes adds mimicry of other birds. Calls include same "chack" notes and a squeaky whistle, "wiiit", often combined as "wiit-chack". Countersings in response to human whistling.
Habitat. Rocky areas within sour grasslands: outcrops, boulder-strewn hillsides, ridges and escarpments, often with scattered bushes, trees and aloes. Seldom away from rocky ground, areas of which may be smaller than 1 ha; some disperse at least temporarily to roadsides, fallows and cattle kraals outside breeding season. Commonest at 1500–1700 m; in places down to sea-level and up to 2000 m.
Food and Feeding. Mainly insects, notably grasshoppers and termites; also nectar. In montane grassland, grasshoppers were main food in Apr, but almost exclusively alate termites as they emerged after rain; otherwise beetles, spiders and ants (especially winged males) taken. Stomachs of seven birds from Free State (South Africa) held, by number, 50% hymenopterans (mostly worker ants), 25% seeds, 9% beetles, 5% lepidopterans, 5% cicadas, 4% soldier termites and 2% plant parts. Nestlings seen fed with grasshoppers, caterpillars and other insects. Fat and maize-meal mix taken at birdtables. Keeps watch from vantage on rock or low bush or tree, and commonly uses four foraging techniques: sallying after flying prey (70% of attempts); sallying to ground after terrestrial prey (15%); bound-and-grab on flat substrates such as flat rocks and short grass; sally-gleaning upwards to pick prey from vegetation. May defend territory all year.
Breeding. Sept–Dec (peak Oct in KwaZulu-Natal), occasionally to Feb; probably often double-brooded. Nest a large untidy cup of dry grasses, lined with animal hair, rootlets and grass, set on bulky base of grass and roots on sloping ground in shelter of rock, or in crevice in rock or wall, or sometimes exposed from above; site sometimes reused. Eggs 2–4, usually 3, creamy-white or buff, sometimes tinged bluish, with fine lilac and reddish-brown freckling. Some suggestion of helpers at nest. No other information.
Movements. Sedentary, but some birds wander outside breeding season, and birds at highest elevations may descend lower in winter, perhaps leap-frogging resident populations at intermediate altitudes.
Status and Conservation. Not globally threatened. Generally frequent to common, but localized. Vulnerable to commercial afforestation of moist grasslands. Appears to have suffered some local extinctions, notably from Magaliesberg Range, suggesting that it may be sensitive also to subtler disturbance. Monitoring of its status recommended.
Bibliography. Clancey (1990), Harrison *et al.* (1997), Keith *et al.* (1992), Kopij (2003), Maclean (1993), Sinclair (1984), Sinclair & Ryan (2003), Tarboton (2001), Tarboton *et al.* (1987), Tye (1988a, 1989a), Vincent (1947).

PLATE 79 ➤



PLATE 79

inches 3
cm 8

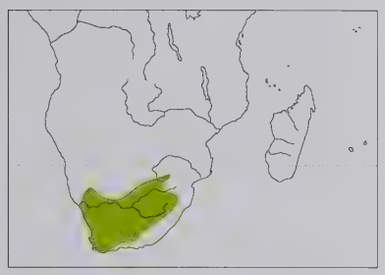
Genus *CERCOMELA* Bonaparte, 1856

300. **Sickle-winged Chat**

Cercomela sinuata

French: Traquet aile-en-faux **German**: Veldschmätzer **Spanish**: Colinegro Sudafricano
Other common names: Sicklewing Chat

Taxonomy. *Lusc.(inia) sinuata* Sundevall, 1858, Saldanha Bay, Western Cape, South Africa.
Three subspecies recognized.
Subspecies and Distribution.
C. s. ensifera Clancey, 1958 – S Namibia and W & C South Africa (E to SW Northern Province).
C. s. hypernephela Clancey, 1956 – Lesotho.
C. s. sinuata (Sundevall, 1858) – Western Cape and N & W Eastern Cape (South Africa).



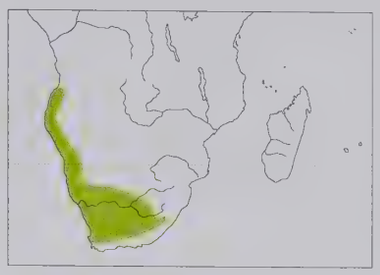
Descriptive notes. 15 cm; 17–20 g. Nominate race is grey-tinged brown above, with buff-white eyering and indistinct paler supercilium (invisible in field), darker eyestripe; darker wings edged rufous-buff, pale rufous rump (upper edge vague) and tail, latter with blackish-brown central feathers and broad terminal band (upper edge of band angled upwards from sides to central apex); paler below, especially on chin and towards vent; tip of outermost primary sickle-shaped; bill and legs black. Sexes similar. Juvenile is like adult, but heavily spotted buff above, mottled dark greyish below. Race *ensifera* is like nominate, but paler and warmer; *hypernephela* is darker and greyer than previous. Voice. Relatively silent, but usual call a quiet, rather high "chak-chak"; has warbled song.
Habitat. Karoo (especially on escarpments, and E grassy Karoo), drier fynbos, shrubby semi-desert, cropfields (especially wheat) and pastures, montane grasslands and alpine slopes. Mainly above 2250 m in Lesotho and KwaZulu-Natal alpine belt, where it replaces *C. familiaris* at high altitudes.
Food and Feeding. Insects and berries. Stomachs of 34 birds from throughout year in Free State (South Africa) held, by number, 50% berries, 24% hymenopterans (mostly winged ants), 9% (mostly winged) termites, 8% orthopterans, 7% beetles, and 2% combining caterpillars, flies and spiders. Forages from low perch such as fence or rock outcrop, dropping onto ground to catch prey.
Breeding. Aug–Mar (peak Oct–Nov in W South Africa) and Nov–Jan in Lesotho and adjacent C South Africa. Nest a bulky cup with base of coarse grass, moss and twigs, lined with dry grass, animal hair, wool and plant down (one built entirely of reddish down from *Protea* flowers), placed on open ground under tuft of herbage or, less often, in shelter of stone or clod of earth, or in crevice in rock or wall; usually well concealed and accessible only through narrow opening. Eggs 2–3, rarely 4 (mean of eight clutches 2·5), pale blue-green, sometimes with light rusty speckling. No other information.
Movements. Sedentary. Race *hypernephela* to some degree makes altitudinal migration to lower levels, moving from Lesotho to KwaZulu-Natal, in severe winters; reportedly vacates Katse Basin (2000–3100 m) in winter.
Status and Conservation. Not globally threatened. Locally common; one of commonest birds of alpine belt above 2900 m in Lesotho. Densities 28 birds/km² in summer and 10 birds/km² in winter in Lesotho highlands. In agricultural habitats, roughly twice as common on ploughed land as in pasture; and twice as common in cereal fields as on ploughed land. May have benefited from overgrazing.
Bibliography. Bonde (1993), Brown & Barnes (1984), Harrison *et al.* (1997), Hockey *et al.* (1989), Keith *et al.* (1992), Kopij (2003), Maclean (1993), Sinclair (1984), Sinclair & Ryan (2003), Tarboton (2001), Uys (1974, 1985), Vincent (1947), Winterbottom (1968a).

301. **Karoo Chat**

Cercomela schlegelii

French: Traquet du Karroo **German**: Bleichschmätzer **Spanish**: Colinegro del Karroo
Other common names: Grey-rumped/Schlegel's Chat

Taxonomy. *Erithacus schlegelii* Wahlberg, 1855, Damaraland, Namibia.
Four subspecies recognized.
Subspecies and Distribution.
C. s. benguellensis (W. L. Sclater, 1928) – SW Angola and NW Namibia.
C. s. schlegelii (Wahlberg, 1855) – coastal Namibia.
C. s. namaquensis (W. L. Sclater, 1928) – S Namibia and NW South Africa (Northern Cape).
C. s. pollux (Hartlaub, 1866) – W & C South Africa (Western Cape E to W Free State).
Descriptive notes. 15–18 cm; 33 g. Nominate race is pale grey from head to upper rump and scapulars, shading to whitish on lower rump and uppertail-coverts; very indistinct paler supercilium; blackish-brown wings and tail, latter with progressively more complete white outer vanes of feathers from second pair outwards, outer feathers fully white; whitish below, washed very pale grey on throat to breast; tip of outermost primary sickle-shaped; bill and legs black. Sexes similar. Juvenile is like adult, but spotted buff above, mottled dark below. Race *benguellensis* is slightly smaller and darker than nominate, ear-coverts tinged brownish; *namaquensis* is slightly larger than nominate and slightly darker than previous; *pollux* is largest and darkest. Voice. Vocalizations include rattling "tirr-tit-tat", "tirr-tit-tat-tut" or "zip-zip-zik-zik-chirp", probably representing song; "chak-chak" or "trrat-trrat" presumably calls.
Habitat. Scrubby and bushy plateaux, stony hillsides, and plains of the Karoo and Namib, especially the succulent-dominated W Karoo. In N of range preference for high ground with scrubby



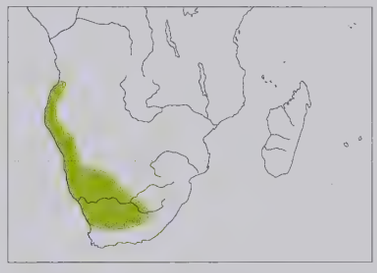
vegetation stronger; usually in more vegetated habitat than *C. tractrac*. Sometimes on outskirts of towns. On semi-arid coastal plain in Angola, from sea-level to c. 540 m.
Food and Feeding. Insects and seeds. Forages on ground, among stones, bushes or grass tufts, sallying down from low perch on bush, rock or fence wire to capture prey. May search fresh aardvark diggings for termites in early mornings.
Breeding. Aug–Mar (peak Sept–Nov, in Western Cape Oct–Dec) in South Africa, season perhaps varying with rainfall. Nest a wide cup of twigs on base of twigs and dry plant stems, lined with dry grass, animal hair and vegetable down, placed in relatively open position under rock, bush (e.g. *Pteronia pallens*, *Galenia fructicosa*) or tuft of grass; nest often reused. Eggs 2–4 (mean of ten clutches 2·6), pale greenish-blue, heavily freckled with rusty-red; incubation and nestling periods c. 15 days.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common in gravel plains of Iona National Park, in Angola; sparse to frequent in Namibia. Common in South Africa, and considered the commonest bird species in succulent karoo, with 190 birds in 850 ha of karroid broken veld (22 birds/km²); occurs at higher density in heavily grazed areas.
Bibliography. Dean (2000), Dean *et al.* (1994), Ginn *et al.* (1989), Harrison *et al.* (1997), Hockey *et al.* (1989), Keith *et al.* (1992), MacDonald (1957), Maclean (1993), Sinclair (1984), Sinclair & Ryan (2003), de Swardt (1989), Tarboton (2001), Winterbottom, J.M. (1966, 1968a).

302. **Tractrac Chat**

Cercomela tractrac

French: Traquet tractrac **German**: Oranjeschmätzer **Spanish**: Colinegro Tractrac
Other common names: Layard's Chat

Taxonomy. *Motacilla tractrac* Wilkes, 1817, Auteniquois country = probably Orange River, South Africa.
Five subspecies recognized.
Subspecies and Distribution.
C. t. hoeschi (Niethammer, 1955) – SW Angola and NW Namibia.
C. t. albicans (Wahlberg, 1855) – W Namibia (W Damaraland, N Great Namaqualand).
C. t. barlowi (Roberts, 1937) – C & S Great Namaqualand, in S Namibia.
C. t. nebulosa Clancey, 1962 – SW Namibia.
C. t. tractrac (Wilkes, 1817) – W South Africa (Northern Cape and SW Free State S to Karoo).



Descriptive notes. 14–15 cm; 25 g. Nominate race is brownish to grey-brown above, slightly browner on ear-coverts, with white rump and uppertail-coverts; wings edged brighter; tail white, with blackish centre and tip forming inverted Y-shape; white to pale greyish-white below, flanks washed buff; bill and legs black. Sexes similar. Juvenile is like adult, but buff-spotted dark brown above, rufous-buff wing edges, brown-mottled buffy below. Race *albicans* is much paler, more whitish-looking, than nominate; *barlowi* is intermediate between previous and nominate, off-white below; *nebulosa* is warmer, more buffish-grey, above than last; *hoeschi* is slightly paler than nominate, longer-winged. Voice. Song a discordant, slurred series of jarring chucks, churrs and gurgles. Alarm call a harsh "check", contact a sharp "trac-trac".
Habitat. Open shrubby plains of the Karoo semi-desert and Namib desert, especially gravel plains with scant vegetation; also stubbly grassveld, scattered bushes on coastal sand dunes, and dry watercourses. Prefers flat country over hilly or broken country. On semi-arid coastal plain in Angola, from sea-level to c. 350 m. Associates only rarely with human habitation. In Namibia, found in true desert areas; present among colony of fur seals (*Arctocephalus pusillus*) at Wolf Bay.
Food and Feeding. Insects, including road-killed tenebrionid beetles. Forages from low perch on bush or rock, sallying to ground to take prey; runs fast.
Breeding. Breeding condition Dec in Angola; breeds Aug–Apr, mainly Sept–Oct, in South Africa, but timing varies with rainfall. Nest a neat cup of twigs and dry plant stems on broad base of twigs, lined with soft grass, hair or wool, placed on ground under shrub or boulder, once inside a gnarled desert cabbage (*Welwitschia mirabilis*). Eggs 2–3 (usually 3), greenish-blue, plain or with fine reddish-brown speckles; fledglings seen with parents for at least one month. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Common and widespread in most of range. In Skeleton Coast Park, in Namibia, in appropriate habitat, as many as ten individuals can be in view at once over wide area. Density 13 birds in 850 ha in karroid broken veld (1·5 birds/km²), but rarer in heavily grazed areas. Present in Iona National Park, in Angola.
Bibliography. Dean (2000), Dean *et al.* (1994), Ginn *et al.* (1989), Harrison *et al.* (1997), Keith *et al.* (1992), Maclean (1993), Meinertzhagen (1950), Ryan *et al.* (1984), Shaughnessy & Shaughnessy (1987), Sinclair (1984), Sinclair & Ryan (2003), Tarboton (2001), Traylor (1962), Winterbottom (1968b).

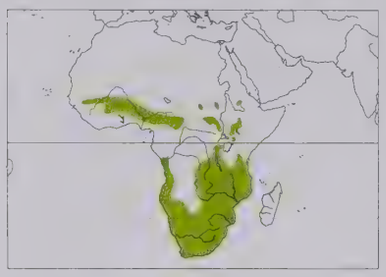
303. **Familiar Chat**

Cercomela familiaris

French: Traquet familier **German**: Rostschwanz **Spanish**: Colinegro Familiar
Other common names: Red-tailed Chat

On following pages: 304. Brown-tailed Chat (*Cercomela scotocerca*); 305. Brown Rockchat (*Cercomela fusca*); 306. Sombre Chat (*Cercomela dubia*); 307. Blackstart (*Cercomela melanura*); 308. Moorland Chat (*Pinarochroa sordida*); 309. White-crowned Wheatear (*Oenanthe leucopyga*); 310. Hooded Wheatear (*Oenanthe monacha*); 311. Hume's Wheatear (*Oenanthe albonigra*); 312. Black Wheatear (*Oenanthe leucura*).

Taxonomy. *Motacilla familiaris* Wilkes, 1817, Table Mountain, south-western Cape Province, South Africa.
May form a superspecies with *C. scotocerca*. Proposed race *modesta* (described from N Malawi) synonymized with *falkensteini*. Seven subspecies recognized.
Subspecies and Distribution.
C. f. falkensteini (Cabanis, 1875) – SE Senegal E to NW Ethiopia, and S Uganda and Tanzania S to Zambezi Valley.
C. f. omoensis (Neumann, 1904) – SE Sudan, SW Ethiopia, NE Uganda and NW Kenya.
C. f. angolensis Lynes, 1926 – SW DR Congo, W Angola and N Namibia.
C. f. galtoni (Strickland, 1853) – E Namibia, W Botswana and N South Africa (N & W Northern Cape).
C. f. hellmayri (Reichenow, 1902) – SE Botswana E to S Mozambique, and E South Africa (Northern Province and N Eastern Cape).
C. f. actuosa Clancey, 1966 – E South Africa (W KwaZulu-Natal S to Drakensberg Mts) and Lesotho.
C. f. familiaris (Wilkes, 1817) – S South Africa (Western Cape and Eastern Cape E to R Great Kei).



Descriptive notes. 14–15 cm; 13–29 g. Nominate race is dull brown to brown-grey above, with distinctive warmer brown ear-coverts, darker wings with buffish-brown edgings, rufous-orange rump and tail, latter with blackish central feathers and broad terminal band; paler below, buffish-grey, paler on throat, becoming more light rufous-tinged buff from belly to undertail-coverts; bill and legs black. Sexes similar. Juvenile is like adult, but spotted buff above, scaled dusky below. Races vary mainly in colour tone of plumage: *falkensteini* is very grey below, without buffy tinge; *omoensis* is darker than previous; *angolensis* is paler on upper body than nominate, with paler rufous in tail; *galtoni* is slightly paler above than nominate; *hellmayri* has slightly paler belly to vent than nominate; *actuosa* is slightly darker than nominate. Voice. Song a quiet, nondescript random series of phrases consisting of soft whistles and subdued chattering, "tswiiip-tswiiip-tswiiip-cher-cher-tswiiip-tswiiip-cher-cher-cher-tswiiip-tswiiip", or "piip-churr-churr, piip-chak-chur, piip-piip…". Calls include shrill whistled "swiiip-swiiip-swiiip", harsh ratchet-like "cher-cher" or "chuck-chuck", or combination of both, latter becoming a rapid high staccato prefaced with high whistles as introduction, "swiii-chukchukchuk, swiii-chuk".
Habitat. Shrubland or light woodland, notably *Brachystegia*, with areas of rocky ground such as erosion gulleys, outcrops, inselbergs, kopjes, scattered boulders, dry streambeds, stony cultivated areas, quarries and buildings. Was found to be common around a village in Zimbabwe but uncommon in surrounding landscape; less associated with habitation in Zambia. In Kenya mainly at 400–1600 m; to at least 2000 m in DRCongo; in Lesotho occurs to 2400 m, above which altitude it is generally replaced by *C. sinuata*. In South Africa, commonest in semi-arid Karoo scrub.
Food and Feeding. Mainly insects, especially beetles, ants and termites; other items recorded include seeds, berries, discarded bread, pet food, roadkill scraps, and reportedly pineseeds, causing damage to pine seedlings. Mulberries (*Morus*) taken from ground and swallowed whole. Stomachs of 14 birds throughout year from Free State (South Africa) held, by number, 40% hymenopterans (mostly winged ants), 35% seeds, 11% beetles, 7% soldier termites, 4% berries, 2% orthopterans, and 1% spiders and sun-spiders. Food brought to nestlings includes harvester termites (*Hodotermes mossambicus*), grasshoppers, caterpillars, a snail, an earthworm and mulberries. Forages by scanning from low perch, e.g. bush, low branch, fence wire, rock, termitarium or wall, and flying down to catch prey, or sometimes hovering to glean. Seen twice to perch on klipspringer (*Oreotragus oreotragus*) and search its ears and body as it lay down, then following it apparently in search of disturbed insects. In Western Cape (South Africa) feeds also in intertidal zone. Tame; flicks wings frequently.
Breeding. Mar in Mali; nest-building Feb in Ivory Coast; Dec in Ghana; Mar–May in Nigeria; Aug and Mar in E Africa; breeding condition Sept–Oct and juv Nov in Angola, and Aug–Dec in DRCongo; Sept–Dec (mainly Oct) in Zambia, Sept–Nov in Malawi, Jul–Jan (peak Sept–Oct) in Zimbabwe, Jul–Jan in S Mozambique, and Jul–Feb (mainly Oct–Nov) in South Africa; sometimes double-brooded. Nest a neat thick cup of plant material, hair and feathers with deep rough base of earth, bark and many transported stones (once 361 stones, 15 7·5-cm nails and 250 miscellaneous items), placed in hole in ground, among roots, in gulley wall, rock face or wall, old nest-chamber of Sociable Weaver (*Philetairus socius*) or martin or swallow (*Hirundo*), in old burrow of White-fronted Bee-eater (*Merops bullockoides*) or Pied Starling (*Spreo bicolor*), in nestbox or discarded tin, among disused machinery, etc.; once in end of a border-post boom (regularly tilted to 45°); one nest with a base made up of 147 stones took 3 days to complete. Eggs 2–4, usually 3, bright greenish-blue with sparse reddish-brown speckling; incubation period 13–15 days; nestling period 13·5–19 days; no direct information on post-fledging dependence, but in cases of second clutch this laid c. 2 weeks after first brood fledges.
Movements. Mainly resident. Possibly present only in Jun–Oct rainy season in N parts of range in W Africa (e.g. Mali); rare vagrant in S Mauritania. Scattered records at high altitudes (to 3000 m in Kenya) near equator in E Africa may suggest local wandering; race *galtoni* may make local winter movements and *hellmayri* thought to be a dry-season visitor (May–Jun) in Lebombo Mts, in S Mozambique.
Status and Conservation. Not globally threatened. Abundance variable throughout range. Common in Kédougou region of Senegal and fairly common in S Mali; local and uncommon in N Ghana, uncommon in Togo and locally common in Nigeria. Frequent to common in Central African Republic, where present in Bamingui-Bangoran National Park. Uncommon to frequent S of 13° N in Sudan; uncommon to locally frequent in Ethiopia. Uncommon to common in NE Uganda and W Kenya; common in NW Mara Game Reserve, in SW Kenya. Present in Serengeti and Lake Manyara National Parks, in Tanzania, and common in S of country. Common up to 1550 m but scarce to 1850 m in Malawi. Local and uncommon in Zambia and sparse to frequent in Zimbabwe; generally common in rest of S African range (South Africa, Botswana, Namibia, Angola), but not in S Mozambique, where restricted to Lebombo Mts.
Bibliography. Bannerman (1953), Benson & Benson (1977), Benson *et al.* (1971), Bonde (1993), Borrow & Demey (2001), Britton (1980), Chapin (1953), Cheke (1982), Cheke & Walsh (1996), Clancey (1962b, 1980, 1996), Day (1987), Dean (2000), Dean & Dean (1987), Hall (1960b), Harrison *et al.* (1997), Hockey *et al.* (1989), Irwin (1981), James (1929), Keith *et al.* (1992), Kopij (2003), Lamarche (1981), Lewis & Pomeroy (1989), Lippens & Wille (1976), Maclean (1993), Morel (1985), Morel & Morel (1990), Nikolaus (1987), Parker (1999), Plowes (1943), Schmidl (1982), Sharland & Wilkinson (1981), Sinclair (1984), Sinclair & Ryan (2003), Skead, C.J. (1995), Skead, D.M. (1966), Skinner (1995), Steyn (1966, 1967, 1968, 1996), Steyn & Hosking (1988), Swynnerton (1908), Tarboton (2001), Tarboton *et al.* (1987), Taylor (1936), Traylor (1962), Vernon (1967), Vincent (1947), Walsh (1987), Webb (1976), Wilkinson & Beecroft (1985), Zimmerman *et al.* (1996).

304. **Brown-tailed Chat**

Cercomela scotocerca

French: Traquet à queue brune **German**: Braunschwanz **Spanish**: Colinegro Pardo
Other common names: (Brown-tailed) Rockchat

Taxonomy. *Saxicola scotocerca* Heuglin, 1869, near Keren, Bogosland, Eritrea.
May form a superspecies with *C. familiaris*. Races *spectatrix* and *validior* have been treated as representing a separate species, but differences appear relatively minor; vocal evidence may help to clarify the situation. Five subspecies recognized.
Subspecies and Distribution.
C. s. furensis Lynes, 1926 – E Chad and W Sudan.
C. s. scotocerca (Heuglin, 1869) – Red Sea hills in NE Sudan and N Eritrea.
C. s. turkana van Someren, 1920 – S Ethiopia, E Uganda and N & NC Kenya.
C. s. spectatrix Clarke, S. R. 1919 – Awash Valley (E Ethiopia) and adjacent N Somalia.
C. s. validior Berlioz & Roche, 1970 – NE Somalia.



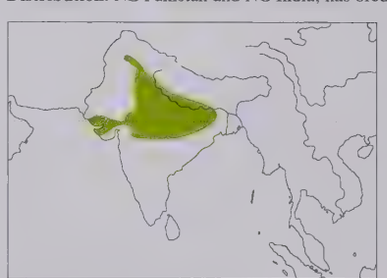
Descriptive notes. 13–14 cm; 16–21 g. Nominate race is nondescript greyish-brown above, with slightly rufescent ear-coverts and rump (not so strong as in *C. familiaris* where sympatric), dark brown wings and tail; throat buffy white, shading to pale brown breast and flanks, greyer belly and whitish vent; eye large, with narrow whitish eyering; bill and legs black. Sexes similar. Juvenile is like adult, but with vague buff tips on crown, wing-coverts and underparts. Race *furensis* is slightly warmer below; *turkana* is slightly darker, rump more rufescent; *spectatrix* is much paler, greyer and larger, with broader paler edgings of wings and tail; *validior* resembles previous, but vent yellowish. Voice. Song a thin, short, rapid liquid chirruping phrase, "seeseesuweet" or "tcheesueet", often introduced by "wip" or "kloo-eet" recalling note of Green Sandpiper (*Tringa ochropus*), and frequently repeated with slight variations at intervals of several seconds. Calls include strong rapid "chuuk-chuuk" or "chukachuk" in alarm, and short sweet trill.
Habitat. Sandstone and boulder-strewn wadis, arid rocky country with scattered shrubs or acacia bushes, bushed grassland; makes more use of bushes than of rocks when perching. Occurs at 400–1200 m in Kenya, 910–1680 m in Eritrea and 1400–1800 m in N Ethiopia; to 2440 m on Jebel Marra, in Sudan.
Food and Feeding. Ants and termites in two stomachs, and seeds in one. Food brought to nestlings in N Ethiopia over 1·5-hour period mostly insects (some with wings removed and including several moth caterpillars), also a lizard 5 cm long.
Breeding. Apr in Eritrea; Mar–Apr in N Ethiopia; nest-building in May in Somalia. Nest like that of *C. melanura*, with foundation of grass, lined with hair, placed in hole (including rodent hole exposed by erosion in gulley) or crevice in rock, with small slope of pebbles outside. Eggs bluish; clutch size uncertain, possibly small, as two nests contained, respectively, 2 and 3 week-old nestlings.
Movements. Presumably sedentary. Present all year in N Ethiopia.
Status and Conservation. Not globally threatened. Race *furensis* locally abundant, with 10–20/ha at Kilingen, in Chad, and common in N Sudan. Nominate race common at 1100–1700 m; up to six territories found in area of 75–100 ha in N Ethiopia. Race *turkana* widespread at 400–1200 m but local and uncommon; present in Samburu National Park and Shaba Game Reserve, in Kenya. Race *spectatrix* fairly common N of 9° N, but *validior* very local S to 7° N.
Bibliography. Archer & Godman (1937–1961), Ash & Miskell (1998), Benson (1946a), Berlioz & Roche (1970), Borrow & Demey (2001), Britton (1980), Cave & MacDonald (1955), Dijksen (1996a, 1996b), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1960), Nikolaus (1987), Salvan (1968), Sclater & Mackworth-Praed (1918), Sinclair & Ryan (2003), Smith (1957), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

305. **Brown Rockchat**

Cercomela fusca

French: Traquet bistré **German**: Braunschmätzer **Spanish**: Colinegro Indio
Other common names: Indian Chat

Taxonomy. *Saxicola fusca* Blyth, 1851, Muttra, Uttar Pradesh, India.
Monotypic.
Distribution. NE Pakistan and NC India; has bred Nepal.



Descriptive notes. 17 cm; 13 g. Plumage is dark brown above, with darker wings and blackish tail, rufous-tinged supercilium and ear-coverts, grading to mid-brown below, with dark grey-brown vent; bill and legs black. Differs from similar female *Saxicoloides fulicatus* in stockier build, stronger bill and shorter legs, squared-off shorter tail held uncocked. Sexes similar. Juvenile has featureless face, paler wings. Voice. Song sweet, warbling and thrush-like, reminiscent of House Bunting (*Emberiza striolata*), with good mimicry. Call a short whistled "chee" in contact, short harsh "tchk-tchk-tchk" in alarm, and sweet mournful downslurred whistle, "pseeu".
Habitat. Low rocky hills, sandstone cliffs, ravines, old forts, quarries, ruins, gardens, rooftops and building lots, sometimes foraging in adjacent fields; generally in lowlands below 1000 m, occasionally reaching 1800 m.
Food and Feeding. Insects, including ants and beetles; spiders. Forages on ground.
Breeding. Feb–Aug, mainly Apr to early Jun; usually two broods, occasionally three. Nest a rough cup of rootlets, grass stems, hair, feathers and fibre, lined with fine fibre and hair, placed in rock cleft, in hole in wall, on narrow masonry ledge, under rafter, on sill, etc., often with pebble or earth rampart; nest reused for second brood. Eggs 3–4, pale blue or turquoise with sparse reddish specks and spots; no information on incubation period; nestling period 14–15 days.

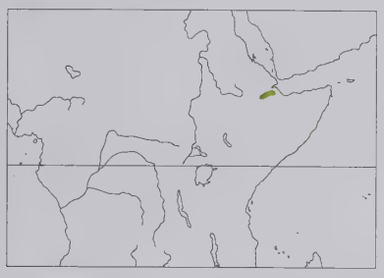
Movements. Largely sedentary; individuals or pairs usually occupy same territory all year. Apparently not present all year in some areas of Gujarat (India), suggesting short-distance movements; in Himalayan foothills present mid-Feb to Oct.
Status and Conservation. Not globally threatened. Locally fairly common; scarce in Nepal. Has adapted to urban areas in much of range.
Bibliography. Ali (1996), Ali & Ripley (1987b), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Matthews (1919), Parsharya (2003), Rasmussen & Anderton (2005), Roberts (1992), White (1919).

306. **Sombre Chat**

Cercomela dubia

French: Traquet sombre **German**: Dunkelschmätzer **Spanish**: Colinegro Sombrío
Other common names: Sombre Rockchat, Sooty Chat

Taxonomy. *Myrmecocichla dubia* Blundell and Lovat, 1899, Fontaly, Ethiopia.
Monotypic.
Distribution. EC Ethiopia.



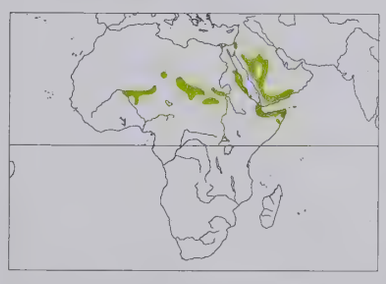
Descriptive notes. 14–15 cm. Large-eyed chat very like *C. melanura* of darkest race *ultima*, but tail dark brown, vent greyish-white or brownish-white or brownish-black; bill stronger. Sexes similar. Juvenile undescribed. Voice. Undocumented.
Habitat. Areas of rock and scrub apparently favoured. In Ethiopia, observed on rocky slopes with grass and scrub at 1250 m and 1560 m on sides and crater of Mt Fantalle. Type specimen was collected in area with rocks and bushes.
Food and Feeding. No information.
Breeding. No information.
Movements. Type specimen collected from a group of 12–15 individuals which were making short flights in one direction across landscape, suggesting migration.
Status and Conservation. Not globally threatened. Data-deficient. Little known, and apparently rare; but equally perhaps locally frequent, and possibly overlooked owing to great similarity to *C. melanura* and *C. scotocerca*. Habitat unlikely to be seriously threatened. In Ethiopia, recorded from a few locations in lower Awash Valley, and at L Beseka and Mt Fantalle, in Awash National Park. Single old record from Xeeleh Mts (Mt Wagar), in N Somalia.
Bibliography. Ash & Miskell (1998), Francis & Shirihai (1999), Keith *et al.* (1992), Ogilvie-Grant (1900), Stattersfield & Capper (2000), Tilahun *et al.* (1996).

307. **Blackstart**

Cercomela melanura

French: Traquet à queue noire **German**: Schwarzschwanz **Spanish**: Colinegro Común
Other common names: Black-tailed Chat/Rockchat, Black-tailed Cercomela

Taxonomy. *Saxicola melanura* Temminck, 1824, Sinai Peninsula, Egypt.
Species often given as *erlangeri*, but that name invalid, as preoccupied. Race *ultima* individually highly variable, possibly not distinct from *airensis*. Six subspecies recognized.
Subspecies and Distribution.
C. m. ultima Bates, 1933 – E Mali and W Niger.
C. m. airensis Hartert, 1921 – N Niger (Aïr) E to C Sudan.
C. m. melanura (Temminck, 1824) – Israel, Jordan and extreme NE Egypt (Sinai) S to NW and interior C & S Arabia.
C. m. neumanni Ripley, 1952 – SW Saudi Arabia, W & S Yemen and SW Oman.
C. m. lypura (Hemprich & Ehrenberg, 1833) – NC & NE Sudan, and SE Egypt S to Eritrea.
C. m. aussae Thesiger & Meynell, 1934 – NE Ethiopia, Djibouti and N Somalia.



Descriptive notes. 14 cm; 13–18 g. Rather long-legged and slender chat. Nominate race is dull pale blue-tinged grey above, forehead and ear-coverts sometimes washed brownish, with darker wings and black alula, black rump to tail; paler greyish-white below, shading to white on belly to vent; bill and legs black. Sexes similar. Juvenile is browner, with pale fringes of wing feathers. Race *neumanni* is slightly darker grey above and below than nominate; *lypura* is pale sandy-grey above, tinged pale brownish below; *aussae* resembles previous, but darker and greyer; *airensis* is grey-brown above, buffish-grey on throat, with cheeks to flanks sandy-brown, shading to cream; *ultima* is darkest, more brown than grey, variable. Voice. Song, by male through most of year (infrequently in autumn), a series of short rapid variable warbling phrases mixing scratchy and whistled notes, "chi kuu chri-ki chiu-teuu" (lasting c. 1 second) or "chree chru chitchu chirri chiwi", etc.; race *neumanni* places stress on first and last syllables in song phrase, whereas nominate unstressed, and songs of *ultima* and *aussae* detectably different. Subsong a protracted jumble of low warbling and wheezy notes. Calls include loud liquid "tyuu-trit" or "chura-lit" for contact, high whistled "fiifii" or "wiii" in alarm, and grating "skirrr" as chick-warning call.
Habitat. Rocky hilly terrain, including dissected subdesert, stony desert with acacia and tamarisk, dry wadis, escarpments, ravines, screes, steep boulder-strewn hillsides, sandstone scarps and sandy dry riverbeds, also stone buildings including houses, huts and walls. Vegetation cover can be negligible, but usually includes sparse acacia and other thorny bushes and scattered shrubs; preference shown for thorny bushes in rocky ravines. Highest densities in Israel in well-vegetated wadis with acacia trees (desert oases) and within settlements.
Food and Feeding. Adult insects (including beetles and ants) and caterpillars reported in Middle East; also berries, including *Lycium shawii*. Food apparently taken to nestlings consisted of caterpillars and winged insects. Forages in perch-and-pounce method, scanning from low perch and flying to ground to take prey; also gleans vegetation, and sallies after flying insects. Sometimes forms loose mixed flock various *Sylvia* warblers. After moving between perches, often slowly fans and flexes tail downwards while half-spreading wings. Not shy.
Breeding. Apr–Jun in Mali and May–Jul in Niger; May in Sudan; Feb–Apr in Ethiopia; May–Jun (probably also Mar–Apr) in Somalia; Mar–Jul in Israel and Arabian Peninsula, although in Oman mid-Feb to Sept; at least 50% of pairs in Israel appear to be double-brooded. Territory (held all year) variably sized, usually 200 m between nests. Nest a shallow cup or pad of grass, hair and leaves, lined with fine grass and hair, placed up to 0·5 m above ground in cleft in rock, hole in bank or wall or gap in road bridge, or under eaves of building or in rock pile; sometimes in old reptile or rodent burrow; rock-cleft nest reportedly with platform of pebbles, not confirmed elsewhere although area around nest entrance often "paved" with stones placed by birds, and one report of entrance reduced in size by pebbles. Eggs 3–4, pale blue with fine to heavy chestnut-brown freckling; incubation period 13–14 days; nestling period 13–15 days.
Movements. Mainly sedentary. Possibly only a summer visitor to Gebel Elba, in SE Egypt, and records in N Egypt may refer to wanderers of nominate race, which breeds Sinai; some altitudinal movement in Israel, descending to lower, more sheltered areas in winter. Rare records in e.g. Nigeria and Gambia (four individuals Feb 1974) suggest some winter dispersal.
Status and Conservation. Not globally threatened. Frequent to common. Density along two wadis found to be c. 1 pair/250 m. Common at Tibesti and S to Largeau, in Chad. Locally common in Sudan from Darfur E to Red Sea, and common in Danakil Desert; fairly common in Forêt du Day and Mabla Mts, in Djibouti. Common N of 7° N in Somalia. Very common resident in desert areas of Israel, with rough estimate of a few tens of thousands of pairs in 1980s; population apparently increasing with increase in cultivated fields, water sources and desert settlements, with which species readily associates. Common along Rift Valley margins in Jordan. Common and widespread in C, W & S Arabian Peninsula. Although records in Nigeria and Gambia (outside known breeding range) interpreted as vagrancy, it is thought possible that they represent local populations at extremely low density.
Bibliography. Andrews (1995), Barlow *et al.* (1997), Barnes (1892), Bates (1934, 1936), Baumgart *et al.* (1995), Beaman & Madge (1998), Blösch (1989), Borrow & Demey (2001), Bundy (1986), Cornwallis & Porter (1982), Cramp (1988), Étchécopar & Hüe (1964), Gallagher & Woodcock (1980), Goodman & Atta (1987), Goodman *et al.* (1989), Guichard (1955), Hardy (1946), Hartley (1952), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Jennings (1995), Keith *et al.* (1992), Leader & Yom-Tov (1998), Ludwig (1999), Mackworth-Praed & Grant (1960), Newby *et al.* (1987), Niethammer (1955b), Nikolaus (1987), Paz (1987), Porter *et al.* (1996), Shirihai (1996), Silsby (1980), Sinclair & Ryan (2003), Smith (1955), Walker (1981), Welch & Welch (1984).

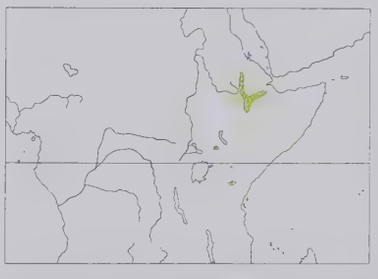
Genus *PINAROCHROA* Sundevall, 1872

308. **Moorland Chat**

Pinarochroa sordida

French: Traquet afroalpin **German**: Almenschmätzer **Spanish**: Colinegro Abisinio
Other common names: Hill/Mountain/Alpine Chat

Taxonomy. *Saxicola sordida* Rüppell, 1837, Simen, Ethiopia.
Close to *Cercomela*, but differs in longer tarsus and shorter tail, and in *Oenanthe*-like tail pattern. Proposed race *rudolfi* (Mt Elgon, in Kenya) synonymized with *ernesti*. Four subspecies recognized.
Subspecies and Distribution.
P. s. sordida (Rüppell, 1837) – Ethiopia.
P. s. ernesti Sharpe, 1900 – E Uganda and C Kenya.
P. s. olimotiensis Elliott, 1945 – Crater Highlands (N Tanzania).
P. s. hypospodia Shelley, 1885 – Mt Kilimanjaro (N Tanzania).



Descriptive notes. 14–15 cm; 18–23 g. Rather dumpy-looking chat. Nominate race is uniform dark grey-brown above, with indistinct pale greyish supercilium, dark brown lores, ear-coverts washed dark brown, dark brown wings edged buff-grey; blackish-brown central rectrices and tail tips creating inverted T-pattern, rest of tail white; buffy grey-brown below; iris dark brown; bill and legs black. Sexes similar. Juvenile is like adult, but with light barring and scaling above and dark-speckled breast. Race *ernesti* is slightly darker above than nominate; *olimotiensis* is like previous above, greyer below; *hypospodia* is darker above than last, with blackish-brown crown, greyer underparts. Voice. Song described as loud metallic piping, or formless, unattractive series of various sparrow-like chirps interspersed with squeaks. Calls include pleasant metallic chirp, "werp-werp", and more sibilant alarm.
Habitat. High rocky alpine moorland and grassland from upper edge of forest (where occasionally race *ernesti* found in forest glades at 2300 m) to 4400 m, mainly above 3400 m and in Ethiopia rarely below 2100 m. Occupies tree heaths above bamboo zone, marshy bamboo–forest openings, low matted grass swards, tussock grass, *Artemisia*-dominated scrub, cultivated fields and vehicular tracks in clearings, and barely vegetated stony slopes. On Mt Kilimanjaro seen almost as high as 5200 m.
Food and Feeding. Invertebrates, including small beetles, their larvae, caterpillars and small snails. Typical chat foraging behaviour, perching low (e.g. on sprig of heath, everlasting flowerhead, stem or rock) and dropping or making short-distance flights to ground to take prey.
Breeding. Feb–Mar, May and Jul in Ethiopia; Jan, Feb, Jun–Sept and Dec in E Africa. Nest a large untidy cup made of grass, lined with plant down, lichen, moss, fur and feathers, placed in cleft of rock, in side of grassy tussock or in split in giant groundsel (*Senecio*). Eggs 3, blue with black and violet spots and streaks. No other information.
Movements. Sedentary, so far as known; some seasonal vertical movements may be expected.
Status and Conservation. Not globally threatened. Common to locally abundant in highlands on both sides of Rift Valley in Ethiopia, but rare below 2100 m. In E Africa common within limited range; scarce at 2300 m, but in Tanzania the commonest bird above 3400 m on Mt Kilimanjaro.
Bibliography. Britton (1980), Keith *et al.* (1992), Lewis & Pomeroy (1989), Mackworth-Praed & Grant (1940c, 1960), Oberholser (1905), Pitman (1956), Pollard (1946), Stevenson & Fanshawe (2002), Zimmerman *et al.* (1996).

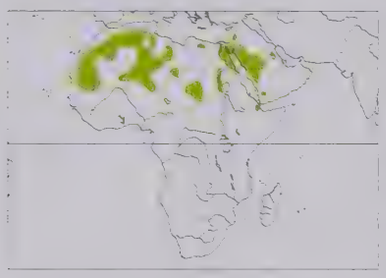
Genus *OENANTHE* Vieillot, 1816

309. White-crowned Wheatear

Oenanthe leucopyga

French: Traquet à tête blanche **German**: Saharasteinschmätzer **Spanish**: Collalba Yebélica
Other common names: (White-crowned) Black Wheatear, White-rumped/White-tailed Wheatear

Taxonomy. *Vitiflora leucopyga* C. L. Brehm, 1855, Kurusku, Upper Egypt.
Geographical variation possibly clinal; some specimens of nominate race along Red Sea coast indistinguishable from *ernesti*. Proposed race *aegra* (W & C Sahara) synonymized with nominate. Two subspecies recognized.
Subspecies and Distribution.
O. l. leucopyga (C. L. Brehm, 1855) – W & C Sahara E to Egypt and Sudan, Eritrea and Djibouti.
O. l. ernesti Meinertzhagen, 1930 – S Israel, S Jordan and NE Egypt (Sinai) S to C & E Arabia and Yemen.



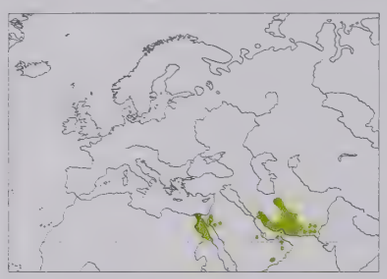
Descriptive notes. 17 cm; 23–39 g. Nominate race is glossy black, with white crown (above eye), vent, rump and tail, latter with black central feathers and sometimes a suggestion of (sub)terminal band; flight feathers blackish; bill and legs black. Sexes similar. Juvenile is duller than adult, with all-black crown; glossier first-year retains black crown, sometimes with some white feathers, e.g. on supercilium. Race *ernesti* is larger and generally more glossy blue than nominate. Voice. Song (mainly by male at dawn and dusk, but female and even young occasionally sing; from perch, occasionally in flight) distinctive, rich and fluty, a series of short phrases (1·5–2 seconds long) with longer pauses (3–9 seconds), each phrase consisting of whistled, slurred or slightly trilled notes, commonly "viet-viet-dreeit-deit", with many variations and types, including distinctive ringing, bell-like "teu-link teu-link"; sometimes with mimicry, but (unlike other wheatears) with few, if any, harsh chacking sounds. Subsong quieter, more continuous and with more chuckling or chacking sounds, often given while loafing; courtship subsong a strangulated mix of squeaks, wheezy whistles, throaty rattles, clicks, creaks, jingling and hissing. Calls include high piercing "sweek" and harsh "jrak" in alarm, the two often interspersed; long quavering "hroo-oo" by male in display; grating buzz; and "juwee" as enticement to young.
Habitat. Breeding range lies almost entirely within driest and hottest areas of Africa and S Middle East, bordered by 30°C July isotherm, with annual precipitation c. 25–30 mm. The only wheatear occupying all mountainous areas across whole of Sahara Desert, from foothills to c. 3000 m. In such areas of scant vegetation, the few bushes are usually less than 1·5 m high. Also found in areas of rock and stone deserts with boulders and deep dry riverbeds, lava fields, wadis, hills, screes, stony slopes, cliffs, ravines and ruins, more locally on outcrops, in gulleys and by steep banks in flat desert; occasionally in sandy desert, and locally in areas with annual rainfall up to 150 mm. Prefers more sheltered, broken terrain with sparser vegetation than that inhabited by *O. monacha* and *O. lugens*. At oases utilizes palm groves, cultivated plots, buildings and cemeteries.
Food and Feeding. Invertebrates, small vertebrates, some fruit. Beetles (including Buprestidae and tenebrionid larvae), crickets, ant-lions, small wasps, aphids, grasshoppers (including adult locusts *Schistocerca gregaria*), caterpillars, butterflies, dung-dwelling insects, and especially ants and flies; also worms, and ticks and other parasites on camels. Locusts and lizards (including Lacertidae and Gekkonidae; tails of latter eaten) targeted in most barren tracts; in Rum Desert, in Jordan, seen to eat scorpions and the poisonous locust *Poekiloceros bufonius*; in Niger, geckos and small viper *Cerastes*. Will also take scraps, such as meat, dates, flour and pomegranate seeds, thrown by Bedouin peoples. Food in E Arabia almost entirely insects, particularly flies, adult and larval lepidopterans, grasshoppers and locusts, beetles and ants, but darkling beetles (Tenebrionidae) and large ants avoided; berries of *Ochrademus baccatus* seen taken. Other plant material recorded includes sumach (*Rhus oxycantha*) and grass seeds. Stomachs of five birds from C Morocco, Nov, all held ants, mixed with beetles and grasshoppers; stomachs from Niger, Jul–Aug, held flies, ants and grass seeds. In two observations young provisioned particularly with larvae, in one year caterpillars of striped hawkmoth (*Hyles lineata*). Forages by scanning from perch and flying to ground to take prey, also by bounding over ground and grabbing it; also digs for larvae with bill, sallies after flying insects, and sometimes hover-plucks berries.
Breeding. Jan–Feb in Mauritania; Jan–May in N Africa and Sudan, apparent peak Mar–Apr in NW; Mar–Jul in C Sahara; end Feb to early Jun in Israel and Feb–Jul in Arabian Peninsula; sometimes two broods, but in Sinai does not breed at all in years of severe drought. Lifelong pair-bond. Sometimes forms loose colonies, e.g. in Morocco, and in Sinai these may be rather compact, with average territory size as small as 0·4 ha; in E Arabia may include up to 4-5 pairs, with territories 4·8–9·1 ha (average 6·7 ha); territory size in Israel 10–50 ha; territory held all year. Nest a loose, sometimes large cup of dried grass, slender twigs and bark, lined with wool, hair, feathers or plant down, placed 0·2–4 m (once 15 m) up in usually deep rock cleft, hole in bank, wall or building, once in base of old nest of Golden Eagle (*Aquila chrysaetos*), and sometimes 1·5 m below ground level in wall of well; pebbles deposited as part-support and pathway to nest, which may be used in successive years. Eggs 3–5, rarely 2–6 (clutch size varying with location and climatic conditions), creamy-white or pale greenish to bluish, with reddish-brown freckles and sometimes pinkish-lilac blotches; incubation period 14–15 days; nestling period 14–16 days; post-fledging dependence c. 3 weeks, sometimes involving brood division; when double-brooded, fledglings may stay on territory and help to feed young of second brood; female sometimes lays second clutch while first brood still in nest, leaving male to feed them. First breeding at 1 year.
Movements. Sedentary; also local migrant. In NW Africa may move S in winter, with local increases in numbers in S Tunisia Sept–Feb; sometimes vacates poorest habitats in dry season. In Israel young may disperse S out of country for winter; some descend to lower elevations during Oct–Mar. In Arabian Peninsula occasionally wanders well away from usual breeding range. Rare vagrant S Europe, Asia Minor and Kuwait; one anomalous record in NW Europe (Britain).
Status and Conservation. Not globally threatened. Nominate race sometimes rather local but generally abundant in suitable habitat; density varies, presumably with habitat quality. In Morocco common in S, and density in one area 0·6 pairs/km²; rare in two regions, Tunisia. Breeding range extended N in Algeria and Tunisia in 1920s and again in 1960s–1970s, possibly in response to increasing desertification. Race *ernesti* locally common to very common; in Egypt, common in oases of Western Desert, along Nile Valley, in Eastern Desert and in Sinai. Putative density 15 pairs/km² in Arabia. Revered by Bedouin tribes. Sometimes becomes rather tame.
Bibliography. Andrews (1995), Arnault (1926), Ash (1980), Bates (1936), Beaman & Madge (1998), Borrow & Demey (2001), Bundy (1976), Bundy *et al.* (1989), Butler (1908), Cramp (1988), Curry & Sayer (1979), Destre (1984), Étchécopar & Hüe (1964), Fischman (1977), Gallagher & Woodcock (1980), Gaston (1970), George (1978), Glutz von Blotzheim & Bauer (1988), Goodman, Meininger, Baha el Din *et al.* (1989), Goodman, Meininger & Mullié (1986), Guichard (1955), Heim de Balsac (1926), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Jennings (1981a, 1995), Keith *et al.* (1992), Ledant *et al.* (1981), Meinertzhagen (1934, 1940, 1954), Newby *et al.* (1987), Nightingale & Hill (1993), Nikolaus (1987), Palfery (1988), Panov (1999), Pasteur (1956), Paz (1987), Porter *et al.* (1996), Shirihai (1996), Sinclair & Ryan (2003), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Tipper & Beale (2002), Tye (1987), Valverde (1957), Vaurie (1949), Vietinghoff-Scheel (1967b, 1984b).

310. Hooded Wheatear

Oenanthe monacha

French: Traquet à capuchon **German**: Kappensteinschmätzer **Spanish**: Collalba Monje
Other common names: Hooded Chat

Taxonomy. *Saxicola monacha* Temminck, 1825, Nubia [= Luxor], Egypt.
Monotypic.
Distribution. E Egypt, S Israel, S Jordan, N, E & SE Arabian Peninsula, Iran and SW Pakistan.



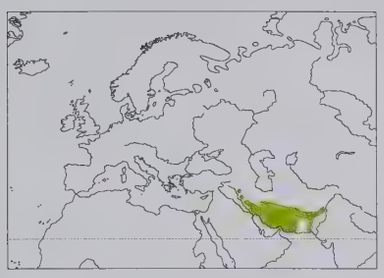
Descriptive notes. 17·5 cm; 18–23 g. A large, slender-looking wheatear with long bill and relatively large head; legs comparatively short. Male is dull black with white crown (through eye) to nape, white lower back to tail, latter with black central feathers and minor black subterminal markings; white mid-breast to vent; bill and legs black. Female is pale sandy-brown, paler below, with mid-grey wings, pale rusty-brown lower back to tail and vent, tail with mid-grey central feathers and hint of subterminal band. Juvenile is like female, but spotted buff above and scaled blackish below; immature male has indistinct blackish breast, white-tipped wing feathers, and vent and tail as female. Voice. Song, by male from perch or in flight, a series of sweet subdued throaty thrush-like warbled phrases each lasting 2 seconds, interspersed with some "stone-clicking" notes. Subsong, heard once, a soft "chuk chuk weez wez". Calls include harsh "zack", rattling "prrup prrup", and "wit wit" in alarm.
Habitat. Desolate desert wadis and ravines, preferably steep-sided, arid open areas on stony or sandy hillsides, wide dry riverbeds with rocks and bushes, quarries and buildings in fields and mountains; often in areas too barren, hot and arid for occupation by other wheatears. On migration in Israel, also saltmarshes and fields. Sea-level to c. 1400 m.
Food and Feeding. Arthropods, including grasshoppers, beetles, dragonflies, butterflies, moths, wasps, bees and ants, larval neuropterans, spiders and ticks. Stomachs of two birds from Iran, Jan and May, held 19 items, of which by number 16% grasshoppers, 16% ants, 42% other hymenopterans, 5% beetles, 5% larval neuropterans, and 5% spiders; of these, 50% smaller than 5 mm, 22% 5–10 mm, 28% 10–20 mm. Forages mainly in air, pursuing flying insects up to 100 m high; flight swift, with sudden steep turns, occasionally complex aerial evolutions. Also scans from perch and drops onto terrestrial prey. Of 16 attacks, 56% were at prey on bare ground and 44% at flying insects. Attracted to goats and camels of Bedouin; visits water troughs to eat large ticks from camels and other livestock, and seen perched on ibex (*Capra ibex*). Territorial in winter.
Breeding. Mar–Apr in Egypt; end Mar to mid-Jun in Israel, and courtship late Apr in Jordan; Mar–Jun in Arabian Peninsula; presumed Apr–Jun in Pakistan. Territory (or, at least, home range) judged as much as 1 km² in Iran, and even several km² in Israel. Nest a small shallow cup of straw and weeds, lined with wool and feathers, placed up to 3 m above ground deep inside wind-fretted hole or fissure in rock over dry riverbed. Eggs 3–5, very pale blue with tiny rust-coloured spots; incubation period 14–15 days; nestling period 14–15 days.
Movements. Sedentary, but some wandering in winter, particularly by females. In Israel, some females wander over large areas and/or migrate S to Sinai, and perhaps return to breeding areas for only quite short part of year. In Egypt records from W of R Nile refer only to wintering birds, Nov–Feb; small numbers also appear in N Sudan in winter. In UAE probably winter visitor and local resident, most records late Aug to mid-Apr; in Bahrain winter immigrants from late Oct to late Mar.
Status and Conservation. Not globally threatened. Moderately common in limited range in Egypt. Scarce and local low-density resident in SE Israel, with total population estimated at 100–200 pairs; similarly low density in Jordan, but populations apparently secure in inaccessible habitat. Estimated 10–50 pairs in UAE. Widespread but scarce in Arabian Peninsula. Very sparse and local resident in S Pakistan.
Bibliography. Ali & Ripley (1987b), Andrews (1995), Aspinall (1996), Beaman & Madge (1998), Bundy & Sharrock (1986), Bundy *et al.* (1989), Cornwallis (1975), Cramp (1988), Étchécopar & Hüe (1964), Gallagher & Woodcock (1980), Goodman *et al.* (1989), Goodwin (1957), Grimmett *et al.* (1998), Hartley (1949), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Jennings (1995), Keith *et al.* (1992), Loskot & Vietinghoff-Scheel (1980c), Nightingale & Hill (1993), Nikolaus (1987), Panov (1999), Paz (1987), Porter *et al.* (1996), Rasmussen & Anderton (2005), Richardson (1990), Roberts (1992), Shirihai (1996), Sinclair & Ryan (2003), Vaurie (1949), Walker (1981), Welch & Welch (1984).

311. Hume's Wheatear

Oenanthe albonigra

French: Traquet de Hume **German**: Schwarzkopf-Steinschmätzer **Spanish**: Collalba de Hume
Other common names: Black-headed Wheatear

Taxonomy. *Saxicola Alboniger* Hume, 1872, stony hills which divide Kelat from Sindh ... and Mekran Coast, Pakistan.
Monotypic.
Distribution. Iraq and SW Iran E to S & E Afghanistan, N & S Pakistan and NE Arabia.
Descriptive notes. 17 cm; 22–28 g. Male is glossy black with white lower back to tail, latter with black central feathers and broad terminal band; flight-feathers black; white breast to vent; bill and legs black. Very like "*picata*" morph of *O. picata*, but larger, bigger-headed, longer bill, wing and tail, more glossy black and purer white, with white extending farther up back, posture usually more



upright. Female is similar to male, but smaller and less glossy. Juvenile is like adult, but browner with dark mottling on hood and back, less clear-cut breastline below. Voice. Song, apparently only by male, a series of short, loud, far-carrying, melodious phrases, "chiroochiri-chirrichiri", or rising "chew-de-dew-twit", or "koooi pi-ri-tlu-ee", or busier, harsher "ki pui tee che-ri-oo chi-chi", with 10–11 phrases per minute, each lasting 1·7 seconds with 4 seconds between phrases. Calls include harsh grating, often rapidly repeated "chack", sharp short whistled "triki-treek" or "trooti-trooti-tree"; quiet "chit-it-it" in alarm.

Habitat. Rocky desert mountainsides, steep valleys and foothill slopes, especially boulders and rubble at foot of barren hills with scanty vegetation, sometimes with scattered shrubs, and even areas of open oak woodland and sparse acacia parkland. Confined to foothills, stony slopes, wadis and ravines of Hajar mountains in UAE. Sea-level to mountains, to 2300 m in S Iran; 1500–3000 m in Ladakh.

Food and Feeding. Invertebrates, small lizards and seeds. In SW Iran, 36 birds had taken mostly beetles (in 89% of stomachs) and ants (in 81%); of total of 1337 items, ants formed 59%; other foods included bees, bugs, termites, lacewings, grasshoppers, flies, scorpions, mites, spiders, lizards up to 7 cm in length, and seeds. In E Iran, summer food mainly large grasshoppers, in autumn sometimes exclusively seeds (mostly of leguminous plants). Forages over open ground, using bound-and-grab method; also uses perch-and-pounce from elevated perch, and sometimes sallies in air. Of 116 feeding events, 45% involved terrestrial dashes, 39% flights to ground, 16% stationary. Defends year-round territory against congeners and similar birds, interspecific boundaries excluding *O. finschii* and and *O. chrysopygia*. In SW Iran, average size of six non-breeding territories in well-watered highlands 5·8 ha; considerably larger in more arid foothills. On wintering grounds both sexes defend individual territories.

Breeding. Jan–Apr in UAE; food-carrying and fledged young Feb–Jul in Oman; at least Mar–May (fledglings from second half Apr and nestlings in N in late May) in S Iran; probably from early Apr in Pakistan; two broods. In Iran, breeding territory in productive highlands as small as 1·1 ha, in barren lowlands 8·5–21 ha. Nest a cup of plant stems and dry leaves cemented to substrate with mud and stones, lined with shredded grasses, wool and feathers, usually with pebble ramp, placed in rocky crevice or deserted building. Eggs 3–4, rarely 5, pale blue, sometimes with reddish freckling. No information on incubation and fledging periods.

Movements. Mainly sedentary; some altitudinal movement and possibly nomadism. Some move outside breeding area in Oct, e.g. to W shores of Persian Gulf, and are present until end Feb. One marked female defended a wintering area in Iran until late Feb, and returned to same territory by end Sept. Some post-breeding dispersal in UAE, with individuals seen well away from usual mountain habitat.

Status and Conservation. Not globally threatened. One of commonest wheatears in Iran, and the most frequent one in mountains of S. Common in UAE, where estimated population 1000–10,000 pairs; common in N Oman. Scarce and local in Pakistan.

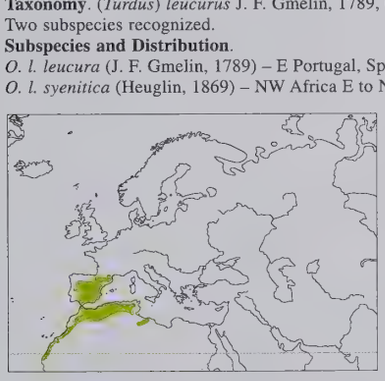
Bibliography. Ali & Ripley (1987b), Aspinall (1996), Beaman & Madge (1998), Cramp (1988), David & Gosselin (2002a), Gallagher & Woodcock (1980), Grimmett *et al.* (1998), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Jennings (1981a, 1995), Loskot & Vietinghoff-Scheel (1980b), Nightingale & Hill (1993), Panov (1999), Porter *et al.* (1996), Rasmussen & Anderton (2005), Richardson (1990, 1999), Roberts (1992).

312. Black Wheatear

Oenanthe leucura

French: Traquet rieur **German**: Trauersteinschmätzer **Spanish**: Collalba Negra

Taxonomy. (*Turdus*) *leucurus* J. F. Gmelin, 1789, Gibraltar.
Two subspecies recognized.
Subspecies and Distribution.
O. l. leucura (J. F. Gmelin, 1789) – E Portugal, Spain and extreme S France.
O. l. syenitica (Heuglin, 1869) – NW Africa E to NW Libya (Jebel Nafusa).



Descriptive notes. 18 cm; 37–44 g. Male nominate race is dull black, with white lowermost underparts (from behind legs), white rump and tail, latter with black central feathers and evenly broad terminal band; flight-feathers dark grey on undersides; bill and legs black. Female is more sooty-brown. Juvenile is like female but duller. Race *syenitica* male is brown-tinged on body and less glossy, female paler than female nominate. Voice. Song a series of brief mellow phrases, each 2–4 seconds long, with pauses of 2–8 seconds, and each consisting of a warble with harsher chacking or grating notes at start and end, recalling *Monticola solitarius*, "chokereu-keu-keke" or "kro zí tero tri rö" or "tlehwee tut fiu tiki-ti pleeooee"; female sometimes sings, but tones harsher and scratchier. Courtship song comprises purring, whinnying and chuckling sounds. Subsong a low, almost continuous warble, given all year. Calls include "chack", quiet "chut" and shrill "zwiir" or "krirr" when disturbed or excited, and loud "pipipipi" in alarm.

Habitat. Steep rocky arid landscapes with rock walls, scattered boulders, bare ground and sparse scrub, avoiding flat terrain: inhabits gorges, ravines, steep-sided wadis, hillsides, screes, scarps, outcrops, sea cliffs, ancient hilltop settlements, ruins and old deserted houses, in wooded, semi-wooded, semi-desert and bare areas. Sea-level to mountains; at higher elevations than *O. leucopyga* in N Africa, reaching 3000 m in Atlas Mts.

Food and Feeding. Invertebrates, small lizards and plant matter. Arthropod food especially beetles (of at least five families) and ants, also grasshoppers, butterflies, moths and their larvae, scale insects, bees, wasps, mantises, flies, and spiders, millipedes, scorpions. Berries and seeds also taken. In one study in SE Spain, ants, grasshoppers and beetles were chief prey (both in number and in weight), with ants predominant at mid-summer and grasshoppers in late summer (when caper berries *Capparis spinosa* also taken); only prey actively preferred (on basis of abundances in samples) were myriapods and curculionid beetles. In another study in SE Spain, chrysomelid beetle *Chrysomela affinis* (7 mm long) was most frequently taken item, with beetles of seven other families, followed by ants and honeybees, and only plant food was wild asparagus berries (*Asparagus acutifolius*). In S France, diet includes beetles (especially the chrysomelid *Timarcha*), grasshoppers (especially *Oedipoda*), lepidopterans and their larvae (latter especially during nestling period), spiders, hymenopterans, mantises, scorpions and berries. Other plant material recorded includes barberry (*Berberis hispanica*), buckthorn (*Rhamnus alpinus*), raspberry (*Rubus idaeus*), olive (*Olea*), brier (*Smilax aspera*) and *Myrtus communis*. Nestlings seen fed on scorpions, lizards, larvae, crepuscular beetles. Forages mainly by scanning from lookout on rock or low perch and flying to ground to take prey, and by bound-and-grab pursuit on ground; also digs at ground with bill, sallies after flying insects, and sally-gleans them from vegetation. Active late into twilight, presumably for crepuscular beetles.

Breeding. Jan–Jun (mainly Mar–May) in NW Africa; nest-building begins mid-Feb (eggs mostly from mid-Mar) in S Spain, and from mid-Apr in N (Pyrenees), with some clutches as late as early Jul; multi-brooded, in S Spain up to five attempts in season and most pairs rear up to three broods, but in S France second broods possible only in years with an early spring (even then no more than 15% of pairs double-brooded). Lifelong pair-bond; of 72 individuals in S Spain, only four changed mates during course of single breeding season. Territories apparently large but overlapping, and boundaries difficult to determine; in study in S Spain territory c. 14 ha, mean distance between seven nests 360 m (minimum 225 m, maximum 660 m). Nest a bulky cup of grass and rootlets, lined with hair and feathers, sited under rock or tussock, or 1·5–3 m (occasionally 8 m) up in hole in rock, wadi bank or wall, including in cave or ruined building, with partial barrier of pebbles placed half under nest and at entrance, accumulated by birds during repeated use of site; in studies, majority of stones carried by the birds weighed between 3 g and 10 g (average 6·8– 7·3 g), but in extreme cases 28 g (two-thirds of bird's own weight); as site often reused in successive years, thousands of stones accumulate at some. Eggs 3–5, white to pale green or pale blue with sparse reddish-brown or deep violet spotting; incubation period 14–15 days, sometimes to 17–18 days; nestling period 15 days, but young not fully fledged when leave nest; post-fledging dependence c. 14 days. Success often poor: of 175 nests in study in S Spain, 18 (10·3%) were deserted, 34 (19·4%) preyed upon and three lost to unknown causes, and failure rate in Spain sometimes at least 60%; ten of 17 nests in S France successful; nest predators mainly snakes (*Coluber hypocrepis*, *Malpolon*), lizards (e.g. *Lacerta lepida*), small mammals e.g. Garden Dormouse (*Eliomys quercinus*), and Common Magpie (*Pica pica*), and nests sited in ruined buildings or man-made caves safer than those in natural cavities; pair may raise up to 13 fledglings in a season, although average (including failed pairs) only 4·7, and in S France mean number per successful nest was 3·5; adults more successful than first-summer birds. First breeding at 1 year.

Movements. Largely or strictly sedentary, but situation variable and perhaps complex. Altitudinal movements occur from highest elevations in Atlas and high parts of Iberia. In Spain, majority of breeders in Malaga appear to move away during Nov–Feb, and considerable passage reported late Oct in Algeciras (S Spain). Records at sites in N Africa not occupied in summer may refer to Iberian birds or to local dispersive populations, or both. Surprisingly wide-ranging vagrancy, e.g. recorded in N & E Europe (Scotland, Norway, Bulgaria) and E to Red Sea coast in Africa, suggesting occasional strong dispersive movements, probably by juveniles.

Status and Conservation. Not globally threatened. Comparatively rare in terms of global numbers. European population in mid-1990s estimated at 4313–15,352 pairs, the great majority in Spain; by 2000 European total considered much the same (4100–16,000 pairs), and trend unknown. Range has greatly contracted and population shrunk to near-zero in S France in long-term process since 18th century, for unknown reasons. General decline in numbers in Iberia also unexplained, although severe winters and afforestation have been suggested as causes, along with disappearance of derelict buildings and man-made caves (preservation of these features deemed essential for the species' survival in Spain); recolonization of areas following burning occurs, however, and controlled burns may be key to creation of appropriate open habitat. Fairly common locally in Spain, where only measure of density is 7 pairs in c. 2·25 km². Uncommon to locally abundant in NW Africa, density reaching 2·6 birds/km² in Morocco; rare in NW Mauritania. Scarce in Tunisia, but common at Jebel Nafusa, in Libya.

Bibliography. Anon. (2004e), Baha el Din (1984), Beaman & Madge (1998), Blondel (1962), Borrow & Demey (2001), Bundy (1976), Cramp (1988), Étchécopar & Hüe (1964), Ferguson-Lees (1960), Glutz von Blotzheim & Bauer (1988), Hagemeijer & Blair (1997), Hódar (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Keith *et al.* (1992), König (1966), Ledant *et al.* (1981), Møller (1992), Møller *et al.* (1995), Moreno *et al.* (1994), Neff (1996), Panov (1999), Perrin de Brichambaut (1989), Prodon (1985), Ramírez & Soler (2003), Real (2000), Richardson (1965), Soler (1994), Soler, Martín-Vivaldi *et al.* (1999), Soler, Moreno *et al.* (1995), Soler, Soler *et al.* (1996), Soler, Zúñiga & Camacho (1983), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Valverde (1957), Vaurie (1955b), Vietinghoff-Scheel (1967a, 1984a), Whitaker (1905).



PLATE 80

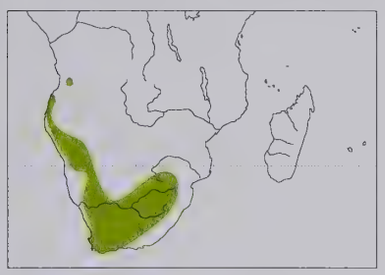
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313. Mountain Wheatear

Oenanthe monticola

French: Traquet montagnard **German**: Bergsteinschmätzer **Spanish**: Collalba Montana
Other common names: Mountain Chat

Taxonomy. *Oenanthe monticola* Vieillot, 1818, Namaqualand, south-west Africa.
Proposed race *griseiceps* (from E Northern Cape, in South Africa) synonymized with nominate. Four subspecies recognized.
Subspecies and Distribution.
O. m. nigricauda Traylor, 1961 – S Cuanza Sul and Huambo, in W Angola.
O. m. albipileata (Bocage, 1867) – coastal SW Angola S from Benguela.
O. m. atmorii (Tristram, 1869) – W Namibia.
O. m. monticola Vieillot, 1818 – S Namibia, South Africa (E to C Northern Province and W KwaZulu-Natal), W Swaziland and Lesotho.



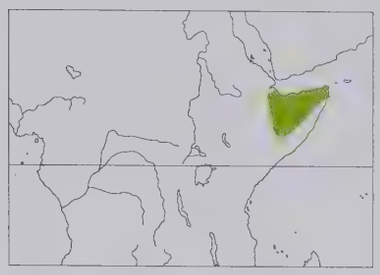
Descriptive notes. 17–20 cm; 31–35 g. Male dimorphic, but with colour variations within both morphs. Male nominate race black morph is black, including bill and legs, except for white shoulder patch, rump and tail, latter with black central feathers and terminal band; individuals may have, in various combinations, darkish grey or bluish-grey crown, narrow white supercilium, white or white-mottled belly to vent, and no black terminal tailband. Grey morph is darkish grey or bluish-grey, except for whitish belly to vent, white shoulder patch, blackish wings, and tail pattern as black morph; in worn plumage shows fine black streaking. Female is brownish-black, with tail as male; in worn plumage appears dark brown, mottled black. Juvenile is like female, with less white in tail. Race *atmorii* is smaller than nominate, black-crowned black-morph male often with white supercilium, grey-crowned black-morph male whitish-grey on crown, grey-morph male whitish-grey; *albipileata* is like previous but smaller, female paler, sandy-brown below, with much white on belly; *nigricauda* male is like black-morph nominate (variable, especially in crown colour, but extent of variation unclear), but black tail has dark grey fringes where nominate tail white. Voice. Song, usually in twilight (sometimes 2–3 hours before sunrise, and all night in moonlight), from perch but occasionally in flight, louder and more musical than those of most wheatears, a series of phrases mostly short (1–2 seconds, occasionally 7 seconds) with pauses of 1–8 seconds, each phrase consisting of a jumble of whistles and trills, with considerable mimicry; female also sings, but incorporating more harsh notes, notably a twanging "cherr". Alarm call "chit-chit".
Habitat. Dry hilly landscapes with rocky ground and usually scrub and grass, including open boulder-strewn grassland, escarpments, outcrops and kopjes in grassveld and Karoo semi-desert, eroded pan and riverbed edges, quarries and old mines in sloping bushy terrain, and sometimes level rocky ground. Often around farm buildings, especially where dry-stone walls present; rarely, surburbia. In Namibia occurs in arid coastal zone, and in Angola from sea-level to c. 2250 m (Mt Moco); in KwaZulu-Natal mostly above 1200 m and in Lesotho below 2500 m. Occupies sandstone slopes in Lesotho, but reportedly shuns sandstone areas in Namibia.
Food and Feeding. Mainly arthropods, including grasshoppers, ants and spiders, with cutworms and other larvae, grasshoppers, crickets, spiders, small beetles and a butterfly seen fed to nestlings. Also plant material. Stomachs of 27 birds from throughout year in Free State (South Africa) held, by number, 52% seeds, 37% hymenopterans (almost all worker ants), 8% beetles, 2% berries and 1% caterpillars, orthopterans and centipedes. One individual caught moths at a light at night, and visited a *Cactoblastis* moth-rearing shed to catch insects at times when these liberated. Will take food scraps such as bread, suet, porridge and grated coconut near human settlements. Forages by bound-and-grab manoeuvres on ground; also scans from perch to drop onto terrestrial prey, and sallies after flying insects.
Breeding. Recorded in most months of year, with distinct peaks in Sept–Nov in winter-rainfall regions of Cape, Nov in Northern Province, Jan–Feb in Namibia, and Dec–Jan in Lesotho; in breeding condition Sept in Angola; in arid regions timing opportunistic in response to rain; usually 2–3 broods, occasionally possibly four. Nest, built over 5–14 days, a rough bulky cup of dry grass, bark, flowerheads and moss, lined with fibres and hair, often with base of small stones, twigs, earth and cobweb, placed under rock on slope, in hole in rock, gulley bank, wall or man-made structure, including road embankment, roof beam, drainpipe or nestbox; old nest of *Cercomela familiaris* occasionally used. Eggs 2–4 (mean 2·8), pale blue to greenish-blue with lilac and pinkish-rufous speckling; incubation period 13–14 days; nestling period 16–17 days; post-fledging dependence not established, but period between fledging and initiation of new clutch 12 days. Occasionally parasitized by Diederik Cuckoo (*Chrysococcyx caprius*) in Namibia.
Movements. Resident, but probably local nomadic movements in drier areas.
Status and Conservation. Not globally threatened. Considered common in much of range. In South Africa, may have benefited from spread of erosion gulleys caused by overgrazing in Eastern Cape.
Bibliography. Bonde (1993), Brown (1993), Butler *et al.* (1883), Davies (1910), Day (1987), Dean (2000), Ginn *et al.* (1989), Harrison *et al.* (1997), Hoesch & Niethammer (1940), Keith *et al.* (1992), Kemp *et al.* (1972), Kopij (2003), Maclean (1993), Plowes (1948), Rowan (1983), Sinclair (1984), Sinclair & Ryan (2003), Steyn (1996), Tarboton (2001), Tarboton *et al.* (1987), Taylor (1946), Traylor (1961), Vincent (1947).

314. Somali Wheatear

Oenanthe phillipsi

French: Traquet de Somalie **German**: Somalisteinschmätzer **Spanish**: Collalba Somalí
Other common names: Phillips's Wheatear

Taxonomy. *Saxicola phillipsi* Shelley, 1885, mountains near Berbera, Somalia.
Has in the past been treated as race of *O. oenanthe*. Monotypic.
Distribution. N & E Somalia and SE Ethiopia.



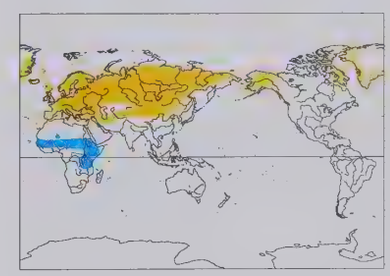
Descriptive notes. 14 cm. Male is bluish-grey from crown to back and scapulars, with narrow white line from above bill to behind ear-coverts, white line between scapulars and black wings, black face and underparts to mid-belly, clearly demarcated from whitish lower belly to vent; white lower back to tail, latter with black central and outer feathers and broad, jagged-edged terminal band with very narrow white tips; in fresh plumage (in second half of year) black of breast tinged grey, sometimes (presumably first-autumn birds) breast entirely grey; bill and legs black. Female is similar to male but duller, has black on cheek and ear-coverts, rest of face and down to breast dark blue-grey, lacks white line on scapular edges. Juvenile is as adult but browner above, with buffy wing fringes, grey-buff breast with mid-brown scaling. Voice. Song unknown. Calls include sharp metallic click, repeated low long whistle, and double buzz accompanied by wing-flicking.
Habitat. Open stony ground, semi-desert, light bush, grassland and burnt-grass areas; mainly at 600–1200 m in N Somalia but down to 190 m in S.
Food and Feeding. Insects, including grasshoppers, beetles, ants, mantises and larvae. Forages by scanning from perch and flying down to terrestrial prey.
Breeding. Apr–Jun. Nest made of grass and hair, placed on ground under bush, rock or fallen branch. Eggs 3–4, turquoise-blue with reddish-brown freckles. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Locally common.
Bibliography. Archer & Godman (1937–1961), Ash & Miskell (1983, 1998), Hall & Moreau (1970), Keith *et al.* (1992), Mackworth-Praed & Grant (1960), Miskell (1991), Sinclair & Ryan (2003), Tye (1986b).

315. Northern Wheatear

Oenanthe oenanthe

French: Traquet motteux **German**: Steinschmätzer **Spanish**: Collalba Gris
Other common names: Wheatear; Black-throated/Seebohm's Wheatear (*seebohmi*)

Taxonomy. *Motacilla oenanthe* Linnaeus, 1758, Sweden.
Has in the past been considered conspecific with *O. phillipsi*. Race *seebohmi* has been suggested as possibly representing a separate species. Birds in Iceland, Jan Mayen and Faeroes included in race *leucorhoa*, but intermediate between that and nominate. Proposed races *nivea* (S Spain and Balearic Is) and *virago* (islands of E & S Aegean, in SE Europe) regarded as synonyms of *libanotica*. Four subspecies recognized.
Subspecies and Distribution.
O. o. leucorhoa (J. F. Gmelin, 1789) – NE Canada, Greenland, Iceland, Jan Mayen and Faeroe Is; non-breeding W Africa (mainly Senegal and Sierra Leone E to Mali).
O. o. oenanthe (Linnaeus, 1758) – N & C Europe and N Asia (S to N Kazakhstan and L Baikal) E to E Siberia and NW North America (Alaska, NW Canada); non-breeding N & C Africa.
O. o. libanotica (Hemprich & Ehrenberg, 1833) – S Europe, Asia Minor, Levant, Transcaucasia, N Iran, Turkmenistan, N Afghanistan, Tien Shan, Mongolia, S Transbaikalia and N China (Xinjiang E to Shanxi); non-breeding N Afrotropics and Mesopotamia.
O. o. seebohmi (Dixon, 1882) – NW Africa; non-breeding W Africa (mainly SW Mauritania and Senegal).



Descriptive notes. 14·5–15·5 cm; 18–33 g (pre-migration *leucorhoa* up to 41 g). Breeding male nominate race is pale grey from crown to back, with black wings, white rump and tail, latter with black central feathers and evenly broad terminal band; white forehead and supercilium, narrow black mask (bill through eye to ear-coverts) bordered below by white line, shading to yellowish-buff on chin to breast, and to white again below; bill and legs black. Non-breeding male has crown to back buffy-brown, ear-coverts stained brown, wing feathers boldly edged golden-buff, and underparts extensively yellowish-buff. Breeding female is like breeding male, but crown to back pale brownish-grey, muted contrasts in face pattern, wings grey-brown. Non-breeding female and first-winter variable, generally pale buff-brown above, wing feathers heavily edged buff and white, buff preocular and white postocular supercilium, rufous-tinged brownish ear-coverts shading to whitish-buff from chin to vent. Juvenile is as first-winter, but speckled buff above, scaled brown below. Race *leucorhoa* is larger than nominate, richer buff below, with broader black band at end of tail; *libanotica* is paler and longer-billed, with narrower terminal tailband; *seebohmi* resembles previous, but black of mask extends to chin, throat and neck side, also black (not pale) underwing-coverts, female upperparts variable from brown to grey, and chin to throat and neck side mottled buff and black or as black as male. Voice. Song, by male (also in winter quarters, usually subsong), from perch or in flight at 15–30 m, a series of short vigorous chattered phrases of 1–1·5 seconds, separated by pauses of 4–8 seconds, each phrase compressing together "chack" notes, trills, whistles, squeaks and often excellent mimicry, in three parts, first part 1–2 notes, second a brief medley, third usually quieter version of first part, thus e.g. "zi zi chakrridl-ridl ii ii"; occasionally more continuous, with fewer pauses; song of race *seebohmi* slower, lower, richer. Courtship song like normal (territorial) song but quieter and more musical, usually by male to female, "eu twirra, zeewirru, zeeu widdlu yu". Quiet subsong a rambling warble, often rapid, between partners and sometimes by juvenile; loud subsong harsher and scratchier as well as louder, used in aggressive contexts and in winter quarters for territorial defence, often in hottest part of day. Calls include throaty "chack" or "tuc" in low-intensity self-advertisement and aggression; repeated "tset-tset" as higher-intensity version of preceding, near nest or young; sibilant "wiit" alarm and warning, sometimes in combination ("wiit-tac"), and a buzz in confrontations; vibrant "bree" by pair-members when

On following pages: 316. Mourning Wheatear (*Oenanthe lugens*); 317. Finsch's Wheatear (*Oenanthe finschii*); 318. Variable Wheatear (*Oenanthe picata*); 319. Pied Wheatear (*Oenanthe pleschanka*); 320. Cyprus Wheatear (*Oenanthe cypriaca*).

together, also as prefix to song in song flight; rattling "tetetetete" as stimulus to partner, often in aggressive contexts; quiet "prrt" by female at nest.
Habitat. Breeds in open ground mixing bare rocky areas (foraging perches, nesting substrate) and short herb layer (foraging areas), from sea-level to mountain tops (latter mainly in S of range), and from very hot summer climates to often very cold ones. Habitats include open stony estuarine plains with sparse clumps of vegetation, sand dunes, shingle stretches, clifftops, coastal islands, heavily grazed heathland and downland, moors, meadows, walled fields, stone-studded bogs, open submontane shrubland, rocky alpine meadows, streamside bluffs, lowland and montane tundra above tree-line; to 3000 m in Europe and Iran, 3500 m in Russian Altai. In study in NW France, optimal breeding habitat contained most uneven topography; in SE Spain, nesting micro-habitat (1 m radius of nest) differed significantly from territorial habitat in helping to conceal nests from predators. In Siberia, Alaska and NW Canada, nominate race occupies extremely inhospitable dry stony hilltops and rock fields adjacent to tundra. In Mongolia found on rocky hillocks in steppes, in Gobi in rocky foothills and higher rocky valleys, preferring combination of grassy and rocky areas (between *O. isabellina* in steppes and *O. pleschanka* in pure rocky areas). Race *leucorhoa* in Greenland seems to prefer warmer, drier interior over cool coast, nesting in moraines, dry riverbeds, ravines, low rolling heathland with large rocks, and mixed dense shrub and open rocky areas. NW African race *seebohmi* breeds on bare stony plateaux, upland meadows, mountain tops and slopes with low sparse scrub, generally above 1500 m. On passage found in wide range of open habitats, e.g. subdesert, oases, wadis, fields, grasslands, rubbish dumps, littoral scrub. In African winter quarters, migrants occupy short-grass acacia steppe, degraded savanna, open fields, barren rocky hills, wadis, and burnt ground.
Food and Feeding. Arthropods, mainly insects (predominantly beetles and ants, latter especially in hotter areas) taken on ground, supplemented by other invertebrates; also berries. Animal food includes adult and larval beetles of at least twelve families, adult and larval lepidopterans of at least six families, adult and larval flies of at least four families, hymenopterans (sawflies, ichneumons, ants, bees and wasps), grasshoppers, crickets, bugs, earwigs, caddis flies, dragonflies, neuropterans, springtails (Collembola), spiders, centipedes, woodlice, small snails and earthworms. Plant food, taken mainly in late summer and early autumn, includes blackberry (*Rubus fruticosus*), rowan (*Sorbus aucuparia*), redcurrant (*Ribes rubrum*), elderberry (*Sambucus nigra*), bilberry (*Vaccinium uliginosum*) and crowberry (*Empetrum nigrum*). In 193 faecal samples from E England, beetles and ants most prevalent, followed by grasshoppers, while direct observation suggested spiders, bees, mites and woodlice as other frequent items. Adult insects in 25 stomachs from Moldova were, by number, 70% beetles, 25% ants and 5% grasshoppers; 23 stomachs from Ukraine held 44% hymenopterans, 36% beetles, 7% adult and mostly larval lepidopterans, 7% other insects, 4% spiders and 2% centipedes; 14 stomachs from Armenia, in summer period, held ants, beetles, wasps, grasshoppers, cicadas, spiders, bugs and seeds. Stomachs of eight birds from Iran, Mar–Aug, held 55% ants, 16% beetles, and very small numbers of other insects, spiders, molluscs and seeds (92% of items less than 1 cm). In Kazakhstan, 80% dry weight of material from 98 stomachs consisted of grasshoppers, ants and beetles (Carabidae, Tenebrionidae and Curculionidae); of 14 stomachs from Russia, all contained beetles, 36% hymenopterans, 29% lepidopterans, 14% orthopterans, 14% bugs, 14% flies and 14% unidentified fruit. In high Arctic (Chukchi Peninsula) twelve stomachs held 36% beetle adults, 18% spiders, 15% caterpillars, 13% beetle larvae, 7% bees and wasps, 3% flies, 1% butterflies and moths and 7% unidentifiable insects. In Greenland, summer insect diet supplemented by crowberries (*Empetrum*), bilberries (*Vaccinium*) and juniper (*Juniperus*), and in Alaska by grass seeds and saxifrage fruits (*Saxifraga*). Young commonly fed soft-bodied prey, larvae of lepidopterans and tipulids often important, and items often larger and less varied than those eaten by adults: nestlings in UK fed with beetles, grasshoppers, crickets and spiders, also small earthworms; in C Sweden, caterpillars and spiders main food for chicks up to 8 days old, proportion of spiders and flies increasing for older nestlings; in Slovakia, relative abundance of food brought to nestlings was 28% butterflies and moths, 22% beetles, 14% bees and wasps, 12% grasshoppers and crickets, 11% flies, 5% spiders, 4% plant lice, 2% cicadas and leafhoppers, 2% millipedes, worms, snails and scorpionflies. In Tien Shan range, Russia, adult and larval insects made up 88% of items numerically (grasshoppers 37% of total, beetles 18%, flies 16%, lepidopterans 10%, hymenopterans 6%, bugs 1%), spiders 11%, woodlice and molluscs 1%. Winter diet in Africa includes termites, ants, bees, beetles, millipedes, small snails, seeds and berries; attraction to burnt areas may reflect preference for ants and termites, which are little affected by fire but more obvious on bare blackened ground. Forages on open ground by bounding pursuit to grab prey ("hop-and-peck"), also "scoops" slow low-flying insects in short run, sometimes jumping to catch them if slightly higher (above c. 5 cm); digs in loose soil for concealed prey. Also flies to ground from perch to take prey ("perch-and-pounce"), sallies after flying insects, and occasionally hover-hunts and sally-gleans. Choice of technique related to local habitat structure, e.g. perch-and-pounce commonly used in dense grass, where active pursuit difficult. Perches on rocks, scanning for movement of prey. Outside breeding season holds individual territory of c. 2–4 ha, defended against other wheatear species.
Breeding. Apr–Jun (from May in High Atlas) in NW Africa; early May to Jun in C & S Europe, early/mid-Apr to end Jul or early Aug in NW Europe, late May and Jun in Iceland, and early or mid-May to early Jul in Scandinavia; Jun–Jul in E Siberia and May–Aug in Mongolia; mid-May to early Aug in North America; single-brooded in Arctic, two broods in many S areas of range, possibly also Mongolia. Monogamous; occasionally polygynous, this usually more frequent in second broods and occurring between neighbours. Generally territory size in N & W Europe 1–2 ha, depending on various factors, including local population size (e.g. on Skokholm, off W Wales, 26 pairs each with 1·9 ha in 1950 and 38 pairs with 1·3 ha in 1951), but considerably larger in alpine and arctic contexts, e.g. 8·7 ha in montane C Europe and 12–16 ha in Greenland; average inter-nest distance 66 m on Skokholm (in 1951), 240 m in Tuva (Russia), 800 m on Baffin I (Canada). Nest an unlined cup of leaves, stems, moss, lichen, feathers and hair bedded on a cradle and foundation of dried stems and grasses, placed in well-sheltered rock cavity, narrow crevice, rodent burrow, hole in wall or under stones; in NW Africa under rock or bush, in wall, cairn, cleft or stack of old plant material. Eggs 4–8 (5–8 Alaska, 4–6 NW Africa), pale blue to whitish, sometimes with a few red-brown flecks; incubation period 11–15 days, mainly 12–14 days; nestling period 15–17 days; post-fledging dependence 12–13 days. Brood parasitism by Common Cuckoo (*Cuculus canorus*) occurs. Of 1519 eggs laid in S Britain during 1948–1977, 83% hatched and 73% of hatchlings fledged; of 98 nests in E England, 28% preyed on, probably mostly by stoats (*Mustela ermina*), and in one year 53 pairs produced average 4·5 fledged young per pair; in NW France, birds in primary habitat fledged 6·3 young per pair per year, as against 4·3 in secondary and 3·1 in tertiary habitat. In another study old (2+ years) males shown to have higher breeding success than yearling males because their nests are less likely to be predated, they produce more fledglings from successful broods, are more likely to renest after complete failure, arrive and breed earlier than yearlings, and are more likely to breed in habitats with a permanently short field layer: nest-predation risk is significantly lower and fledgling production among successful breeders higher in territories with permanently short as compared to steadily growing field layer, latter habitat being mainly occupied by yearling males (data on process of habitat occupation suggest that yearlings poorer than older males at identifying territories with a permanently short field layer). Age of first breeding 1 year. Causes of mortality among individuals ringed in NW Europe are natural predator 8%, human-related (accidental) 20%, human-related (deliberate) 58%, other 14%. Oldest recorded bird 7 years.
Movements. Migrant, with remarkable capacity for long-distance travel, and possibly geographically widest record of vagrancy of any passerine (Mexico, West Indies, Seychelles, Borneo, Philippines); mainly nocturnal but also by day. Entire population winters in Africa. Race *leucorhoa* leaves breeding areas mid-Aug to early Oct, migrates through Britain, distance of flight across N Atlantic 2400 km and may last 30 hours; some Canadian nesters may cross Atlantic from extreme E Newfoundland to Azores and thence to W Africa; rapid onward movement SSW from N Britain through France and Spain, so that passage in N Africa also mainly Sept–Oct. Returns Mar and early Apr through N Africa and Iberia, arriving Iceland and Greenland late Apr and May, but not until mid-Jun in extreme N breeding areas. Some evidence that breeders in Greenland and NE Canada may migrate direct to and from N Spain. Nominate race and *libanotica* cross Mediterranean on broad front, S passage in Spain and N Africa considerably strung out from Aug to Nov/Dec but with peak Sept–Oct, and N passage equally extensive, Jan–May, with peak Mar–Apr, often with rapid progress N (species noted as one of earliest spring migrants in NW Europe). Owing to extended nature of these movements, same passage dates apply to arrival and departure times in Africa from Sahel across to Ethiopia, and even in equatorial regions dates very similar: in Rwanda, Uganda, Kenya and Tanzania arrives mid-Sept (peak Oct) and departs Mar to mid-Apr (Feb–Mar in Tanzania); in DRCongo, Zambia, Malawi and Zimbabwe main arrival Oct, departure Mar. Some local winter movements may be related to rainfall: in Serengeti first appears in recently rained-on areas, and subsequent distribution may vary with rainfall patterns. Autumn passage in UAE mid-Sept to late Nov, in Bahrain mainly Oct, in E Saudi Arabia Aug–Nov, in Israel chiefly late Aug to early Oct. In far E of breeding range, peak autumn passage of nominate race in second half Aug in Alaska (some remain to Oct), also in NE Siberia, with passage through C Russia late Sept to early Oct, reaching winter quarters in same months; nothing known about differences in schedules, directions and patterns of migration of longitudinally disparate populations extending from Urals E to Alaska, but presence of autumn migrants in N & W Pakistan in Sept–Oct and Apr tends to suggest that some make direct sea crossing over W Indian Ocean (vagrants in Seychelles mostly Dec–Mar, sometimes as early as Oct, presumably refer to this phenomenon, and perhaps originate from far E breeding populations). Males undertake spring migration 1–2 weeks earlier than females. Arrivals in NW Europe mainly mid-Mar to early Apr, middle to late Apr in C Scandinavia, with passage through Middle East late Feb to mid-May, and first arrivals Iran and S Kazakhstan late Mar, Transbaikalia mid-Apr, E Siberia and Alaska late May or early Jun. Race *seebohmi* in NW Africa leaves Atlas early Sept to late Oct, moving SW to W Africa, returning early Mar to early Apr; some merely descend lower and travel only short distance. Vagrants recorded throughout much of Old World, S to South Africa, Indian Ocean islands, Borneo and Philippines; also in America, S to California and Gulf coast of USA.
Status and Conservation. Not globally threatened. Generally common throughout range; fairly common in N & NW China. Total wintering in Africa, thus representing global population, put at 124,000,000 individuals in 1960s. European population in mid-1990s estimated at 2,569,616–3,771,693 pairs (great majority in Norway), with additional 1,000,000–10,000,000 pairs in Russia and 50,000–500,000 pairs in Turkey. By 2000 total European population (including European Russia and Turkey) revised to 4,600,000–13,000,000 pairs, but considered in decline. In optimal habitat may reach density of 35 pairs/km², although particularly in uplands typically much lower. Has declined in many W & C European countries owing to habitat change through agricultural intensification and urbanization, and reduction in sheep-farming in some countries has reduced amount of short-grass habitat much favoured by species; droughts in Sahel winter quarters in 1972 and 1983 likely to have taken a further toll of global population. Formerly trapped for food in volume in Europe, and still taken in large numbers in parts of Mediterranean Basin and N Africa, as reflected by high proportion of recoveries of birds ringed in NW Europe. In contrast, race *leucorhoa* extending range in Canada along W coast of Hudson's Bay and in NE Labrador. Race *seebohmi* common but local breeder in Morocco; at least 50,000 individuals of this race winter in SW Mauritania alone (and density of 2 birds/km² suggests at least 150,000 birds in 77,000 km² S of 18°02'N in the country), but becomes uncommon to rare in winter farther S (Senegal and Mali). Otherwise, the species is common to abundant in winter in Sahel zone in N Senegal, with as many as 40 birds/km² (Senegal and Gambia main wintering area for *leucorhoa*), or even, when tree density very low, 1 bird/ha (100/km²) in N Nigeria; common to abundant elsewhere in wintering quarters, but becoming uncommon rare in S (N Zimbabwe).
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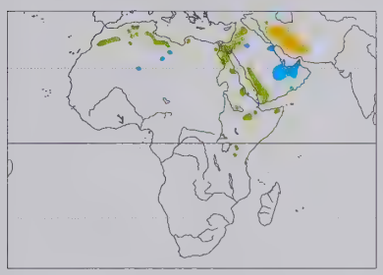
316. **Mourning Wheatear**

Oenanthe lugens

French: Traquet deuil **German**: Schwarzrücken-Steinschmätzer **Spanish**: Collalba Núbica

Other common names: Mourning Wheatear ("nominate group"); Arabian/South Arabian Wheatear ("*lugentoides* group"); Abyssinian Black Wheatear ("*lugubris* group"); Schalow's/East African Wheatear (*schalowi*)

Taxonomy. *Saxicola lugens* M. H. K. Lichtenstein, 1823, Nubia [= Deram].
Has been treated as conspecific with *O. finschii*. Taxonomy complex. Races fall into four basic groups, each of which could possibly be treated as a separate species: "nominate group" (also including *halophila* and *persica*); "*lugentoides* group" (with *boscaweni*); "*lugubris* group" (with *vauriei*); and single-taxon "*schalowi* group". Differences between nearest-neighbour groups, however, are weak, even though total variation is high, and situation further complicated by presence of morphs within certain races (e.g. black morph of nominate, adapted to living on black-basalt shield of S Syria and N Jordan); consequently, new arrangements can overlap, e.g. the "*lugentoides* group" has been treated both as a species on its own and as a member of a separate species that includes the "*lugubris* group" and *schalowi*. Pending extensive sampling of vocal, behavioural and ecological evidence, all groups are considered better retained within one polytypic species. Eight subspecies recognized.
Subspecies and Distribution.
O. l. halophila (Tristram, 1859) – N Africa E to W Egypt (W of R Nile).
O. l. lugens (M. H. K. Lichtenstein, 1823) – Syria, Israel, Jordan and NW Arabia S to E Egypt and NE Sudan.
O. l. persica (Seebohm, 1881) – NC, WC & SW Iran; non-breeding Arabia and NE Africa.
O. l. lugentoides (Seebohm, 1881) – SW Saudi Arabia and W Yemen.
O. l. boscaweni Bates, 1937 – NW Yemen and S Oman.
O. l. lugubris (Rüppell, 1837) – Highlands of Eritrea and N & C Ethiopia.
O. l. vauriei Meinertzhagen, 1949 – NE Somalia.
O. l. schalowi (Fischer & Reichenow, 1884) – S Kenya and NE Tanzania.

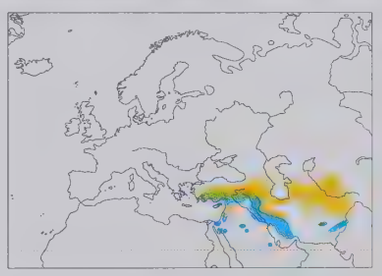


Descriptive notes. 14–16 cm; 19–25 g. Breeding male nominate race has white crown (through eye) to nape, black face, throat and neck side continuous with black wings and upper back, white lower back to tail, latter with black central feathers and terminal band; in flight, extensive whitish panel on upperwing (broad white bases of inner webs of flight-feathers); underparts white, with rusty-buff vent; black bill and legs. Non-breeding male has brownish-stained crown, and sandy margins above and on throat. Black morph (in basalt desert of S Syria and N Jordan) almost entirely matt black except for white vent. Sexes similar, female slightly duller on mantle and throat. Juvenile is sandy-buff, streaked brown above and creamy-buff below, with blackish ear-coverts, faint grey scaling on breast; first-year in spring resembles dull adult, with pale-fringed brownish wings. Race *halophila* male is like nominate but vent only tinged buff, greyish open upperwing, female variable, c. 35% resemble male, c. 42% like dark-throated female *O. finschii* but darker-winged, and remainder intermediate between those two; *persica* is like nominate, but crown usually brownish-grey with white supercilium, broader terminal tailband, darker orange-buff vent, female generally slightly duller than male; *lugentoides* male is more thickset than nominate, black of throat extending to upper breast, black of back extending farther up on nape and down on rump, vent orange-buff, smaller panel in open upperwing, a few dark crown streaks; *boscaweni* is like previous, but no dark streaks on white crown, more extensive white rump; *lugubris* has crown dirty brown, streaked black, breast and flanks black (area variable), white of rump and tail replaced by orange-buff, no white in wing (black morph has all underparts black); *vauriei* male is similar to previous, but base colour of crown to hindneck pale greyish-buff, small white panel in open wing; *schalowi* is also similar, but slightly brown-tinged dorsally, rump and tail more rufous-tinged, belly always white, female browner, rather heavily streaked on breast and upper belly. VOICE. Song (by both sexes, male more commonly; sometimes in flight) a loud sweet warbling series of phrases each 5 seconds long,with pauses of 3–4 seconds, each repeated several times before changing content, and each consisting of whistles, squeaks, churrs, twangs and "chack" notes; in winter often more continuous and subdued, but energetic in Jul–Oct. In territorial disputes can become continuous, with much mimicry. Subsong, commonly in Oct–Feb but also in territorial disputes, a low short, sweet but thin reedy warbling. Calls include soft sharp "chut, chut", louder "chzak-chzak" in alarm, sometimes with interspersed high "seek", scolding "shrrr" and high piping when under attack from congener.
Habitat. Boulder-strewn, sloping, broken desert country, often with caves for shelter: limestone escarpments, rocky slopes, valleys and plains, screes, cliffs, ravines, gorges, desolate dry wadis, shingle ridges, flat pebble plains at base of stony hills, sometimes in villages, in lowlands and mountains (in Tunisia keeps to stony mountains, avoids coastal plains); in Ethiopia on moors and ploughed fields, 1200–4000 m; in SW Iran breeding at 1700–2700 m. Race *lugentoides* inhabits areas of flattish ground and rocky hillsides with sparse low vegetation but often with bushes and acacia and other trees, including thick juniper scrub near cultivation, 1000–2500 m; of 145 individuals Jul–Sept, only two on flat habitats, majority on rocky or stony hillsides more than 30 m high. In winter, found in lower but hilly areas, always with broken ground providing shade and shelter.
Food and Feeding. Mainly ants in Africa; also beetles, grasshoppers, butterflies and other insects. Stomachs of eleven birds from SW Iran, Mar–Nov, held 422 items of which 85% by number were ants, 5% beetles, 3% other hymenopterans, and 7% a mix of grasshoppers, termites, bugs, flies, spiders and plant material; of 316 items measured, 95% were less than 1 cm long. Other food recorded outside Africa includes ant-lions, bees, wasps, caterpillars, sun-spiders, and specifically wild olive (*Olea chrysophylla*) and red berries from a juniper-like bush. Nestlings in Israel fed with caterpillars, termites, locusts, beetles, flies, larvae, woodlice, scorpions and berries; in Yemen large white larvae, a small black beetle and small red berries taken to nestlings. Forages by bound-and-grab terrestrial manoeuvres, by sallying in air after flying insects, and by flying down onto prey from low perch. Individual winter feeding territories sometimes as little as 1·5 ha, larger in more barren terrain.
Breeding. Mar-Jul in NW Africa; Feb–Jun in Egypt; Mar–Aug in Ethiopia; Oct–Jul in Kenya, with possible peak Mar; mid-Mar to end Jun in Israel; Apr–May in Jordan; extended season in S Arabian Peninsula, nestlings Mar–Jul, nest Sept, fledglings Jan; newly fledged young in Oman mid-Apr to mid-Jul; mostly double-brooded, probably also in Oman and reportedly in Egypt, but not in Iran. Territory size in Israel c. 10–25 ha, average for eleven pairs in Negev mountains 16·5 ha. Nest a loose flat cup of dry grass, stems and roots, lined with rootlets, hair or wool, placed in hole deep in rock, cliff, bank or wall, or under rock, including rodent hole; often with rampart and/or base of small stones or pottery chips underneath and at entrance. Eggs 3–6, but only 1–3 in E Africa, pale grey-blue to dull greenish-blue, spotted with reddish-brown and violet; incubation period 13–14 days; nestling period 14–16 days; if second brood attempted, young males from first brood may help to feed nestlings, while young females disperse from territory.
Movements. Majority sedentary in Syria, Israel, Jordan and SW Arabia; black morph of nominate entirely sedentary. Some movement of N African populations in winter into interior plains bordering or within Sahara, most movements probably less than 50 km, some reaching Aïr and Ahaggar massifs in Jan–Feb; males more likely to remain near breeding areas. Origin of birds wintering in Sudan unclear (records cover early Nov to mid-Feb); could be N African or Asian breeders. Makes short-distance movements from breeding areas in dry wadis in mountains between R Nile and Red Sea to wintering areas on spurs and shingle ridges where wadis open towards Nile. Period of winter dispersal in Israel mainly Sept–Feb. In Bahrain and UAE scarce winter visitor mid-Oct to mid-Mar, but widespread in substantial numbers E Saudi Arabia Oct–Mar (consisting of black-and-white "male" types, but with influx in Feb–Mar of grey-and-white birds); these migrants include population in SW Iran, which is entirely migratory, leaving breeding grounds from early Sept and returning from mid-Feb. Some individuals of race *lugentoides* may move into C Saudi Arabia in winter.
Status and Conservation. Not globally threatened. Generally locally common to abundant in N Africa, including Egypt mainly E of R Nile. Rather scarce in Morocco and Tunisia. Frequent to common in three isolated populations in NE & E Africa (races *vauriei*, *lugubris* and *schalowi*). Common resident in Israel, where population in Negev and Judean Deserts estimated at a few thousand pairs. Race *lugentoides* common in SW Arabian Peninsula.
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317. Finsch's Wheatear
Oenanthe finschii

French: Traquet de Finsch **German**: Felsensteinschmätzer **Spanish**: Collalba de Finsch
Other common names: White-backed Wheatear

Taxonomy. *Saxicola Finschii* Heuglin, 1869, Syria.
Has been treated as conspecific with *O. lugens*; interface of race *barnesi* and race *persica* of latter worthy of analysis. Two subspecies recognized.
Subspecies and Distribution.
O. f. finschii (Heuglin, 1869) – Asia Minor and Levant (including extreme N Israel) E to W & SW Iran; non-breeding also coastal E Mediterranean, N Egypt and Middle East.
O. f. barnesi (Oates, 1890) – E Turkey, NE & E Iran and W Turkmenistan E to SC Kazakhstan, E Afghanistan and W Pakistan; non-breeding also Mesopotamia and SW Asia.



Descriptive notes. 14 cm; 22–32 g. Rather stocky and large-headed. Breeding male nominate race is white from crown (sometimes stained buff-grey) to tail, latter with black central feathers and relatively narrow black terminal band (with white tips when fresh); black face and throat connecting to black wings, flight-feathers with silvery-grey inner webs (distinctive in flight); underparts white; bill and legs black. Non-breeding male similar, but crown to back tipped greyish-yellow, wings edged buff, throat hoary and underparts tinged buff. Breeding female resembles non-breeding male, looking grizzled around face and chin, with pale brownish-grey from crown to back. Non-breeding female brownish-grey on crown to back, either with relatively pale grey-brown on wing and extending to throat and breast, with buffy-tinged ear-coverts, whitish submoustachial and throat streaks, whitish belly to vent, or with blackish wing, blackish face and throat with whitish submoustachial and throat-streaks, whitish underparts (differences perhaps age-related). Juvenile is like pale-throated non-breeding female, but with broader buff fringes on wings; first-year male may have lower back black (unlike *O. lugens*, black not extending to mantle). Race *barnesi* is longer-winged and larger-billed than nominate, in fresh plumage male has head stained sandy-yellow and deeper cream-buff vent, female buffier above (in worn plumage in spring, both sexes identical to nominate). VOICE. Song, by both sexes (mostly by male, often in descending zigzag display-flight), a series of phrases recalling a *Galerida* lark, each consisting of highly varied mix of clear whistles, rich warbling (including "ctsi-tsi-tsi-tseeooee") and scratchy, grating sounds, and (relatively rarely) mimicry; when delivered in flight becomes longer and less structured, described as a high squeaky "zee-widdy-widdy-widdy-widdy-tweee". Subsong given in winter, a subdued rambling version of full song, resembling that of *Erithacus rubecula*. Calls include "chack" or "zek" in mild agitation, a descending "seep" in alarm, commonly combined as "seep chek seep chek chek", etc.
Habitat. Breeds in rocky sloping country, and particularly limestone canyons and ravines, in and at bases of foothills and low mountains in sparsely vegetated scrubby semi-desert, dry boulder-strewn slopes with outcrops and clefts, screes, talus mounds, empty gulleys and ravines, desert edge and adjacent dry fields; generally to 800 m, but reaching 2200 m in Iran. In Armenia favours stony mountain slopes and rocky steppe dominated by *Artemisia*, *Euphorbia*, *Atraphaxis*, *Astragalus* and *Acantholimon*; in Iran, all breeding territories included flat or gently sloping land with areas of bare ground and boulder rubble, and with patches of low-growing steppe plants. In winter prefers more open plains areas; in Israel, occupies bushy hilly areas and rocky slopes and hillsides, filling niche occupied by breeding *O. hispanica*; in Iran, occupies sub-steppe and steppe, and deforested parts of xerophilous forest zone, sea-level to 1900 m.
Food and Feeding. Invertebrates, especially ants and beetles, also seeds and other vegetable material. Stomachs of 31 birds from SW Iran, Jun–Jul and (mainly) Nov–Feb, held 2160 items, of which 88% were ants; ants present in 90% of stomachs, beetles in 61%; other items included grasshoppers, crickets, bugs, termites, lacewings, insect larvae, spiders, woodlice, seeds and other plant material. Four stomachs from Tadjikistan held beetles, flies and hymenopterans; elsewhere in C Asia ants, beetles, grasshoppers, caterpillars and occasional vertebrates (presumably small lizards) recorded, and evidently diet varies with local and seasonal availability. Food brought to nestlings includes adult and larval beetles, caterpillars and grasshoppers. Forages by scanning from perch atop small shrub or rock and flying down to take terrestrial prey (perch-and-pounce), and by bound-and-grab

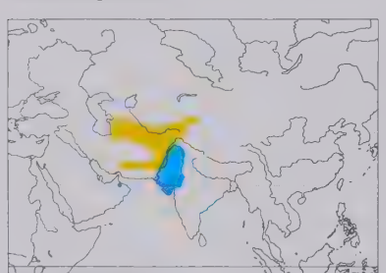
manoeuvres on ground; 97% of prey caught by these methods in Iran. Occasionally sallies after flying insects. Wintering male in E Saudi Arabia, in sparsely vegetated desert, used perch-and-pounce from shrubs and stones, restlessly pursuing prey; but on bare stony desert used bound-and-grab method, pausing and then hopping rapidly. In SW Iran forages throughout day in winter; at other times of year feeds mainly in morning and evening. Individual territories held on passage and in winter; winter territories 3–6 ha in Iran, where may occupy same area in successive years.
Breeding. From Apr in W of range, to Jul in Armenia; May–Jun in Caucasus and C Asia, but reportedly as early as mid-Feb in SC Asia (but not before early Apr in N); May in Pakistan; two broods, sometimes three in SC Asia (but perhaps only occasionally double-brooded in N). Territory fairly large, in one area average 2·9 ha with diameter 100–230 m, but density usually low and boundaries not contiguous. Nest a shallow cup of twigs and plant stems, lined with grass and hair, placed in shallow ground depression among rocks, under heap of stones, sometimes to 80 cm down rodent burrow (almost exclusively so in sandy deserts in NE of range); usually stones placed in nest entrance and tunnel; site sometimes used repeatedly over the years, and large piles of stones then accumulate. Eggs 4–6 (second clutches larger than first), slightly pinkish-tinged white with tiny reddish speckles; incubation period 12–13 days; nestling period 15–16 days.
Movements. Migrant, partial migrant and, in S of breeding range, probably sedentary or making short-distance vertical movements. Some remain in Kazakhstan and Turkmenistan in winter, as do 70% of population of SW Uzbekistan, but pattern may be weather-dependent. Winter visitor across S Turkey, Cyprus (from late Sept), Syria, Rift Valley S to N Egypt (early Oct to mid-May), N Saudi Arabia, N Iraq (from mid-Oct), SW Iran (arrival end Aug to Oct), Afghanistan, and into W Pakistan (present early Oct to early Mar, although arrivals as early as mid-Aug). Autumn passage in Israel and Jordan mainly mid-Oct to mid-Nov, many wintering Nov–Mar, with spring passage mainly first week Mar. Elsewhere, return passage as early as late Feb, males arriving on breeding grounds up to 2 weeks before females, from early Mar in Kazakhstan and mid-Mar in Armenia.
Status and Conservation. Not globally threatened. In c. 2000 total European population judged to be 100,000–310,000 pairs and considered generally stable. Uncommon in Caucasus and C Asia; common in Armenia. Breeding densities naturally relatively low, presumably owing to barrenness of habitat, and 4·5–10 pairs/km² probably optimal; in S Transcaucasia and NE Caspian region reaches quite high densities, average 17·4 individuals/10 km. Fairly common winter visitor in Israel and Jordan, but uncommon in Nile Delta region, and rare in Qattara Depression (Egypt).
Bibliography. Adamian & Klem (1997, 1999), Ali & Ripley (1987b), Andrews (1995), Anon. (2004e), Baumgart *et al.* (1995), Beaman & Madge (1998), Bundy *et al.* (1989), Capek & Kloubec (1996), Cornwallis (1975), Cramp (1988), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Kasparek (1992), Keith *et al.* (1992), Nightingale & Hill (1993), Paludan (1959), Panov (1999), Portenko & Vietinghoff-Scheel (1971c), Porter *et al.* (1996), Rasmussen & Anderton (2005), Roberts (1992), Roselaar (1995), Shirihai (1996), Ticehurst (1927), Vaurie (1949).

318. Variable Wheatear

Oenanthe picata

French: Traquet variable **German**: Elstersteinschmätzer **Spanish**: Collalba Variable
Other common names: Eastern Pied Wheatear, Pied Chat

Taxonomy. *Saxicola picata* Blyth, 1847, Sind, Pakistan.
Occurs as three forms, considered to be morphs; "*picata*", "*opistholeuca*" and "*capistrata*". These are commonly treated as races, and sometimes as full species; alternatively, the first two together have been considered as one species, and the third as another, an arrangement which may possibly be more appropriate. Populations of "*capistrata*" × "*opistholeuca*" exist, however, and there are records of hybrid male "*capistrata*" × "*picata*" pairing with female "*opistholeuca*". The morph "*capistrata*" has been thought perhaps to represent a hybrid swarm with *O. pleschanka*, which both sexes closely resemble. Treated as monotypic.
Distribution. NE & SE Iran and Turkmenistan E to W Tien Shan, Pamirs, and N & W Pakistan; non-breeding SW Asia.



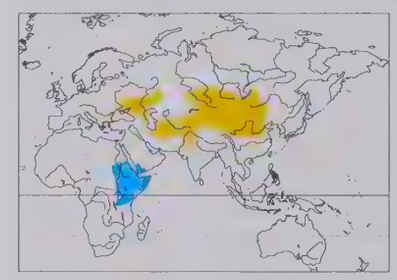
Descriptive notes. 15 cm; 20–25 g. Male of "*picata*" morph resembles *O. albonigra*, but is smaller, smaller-headed and less glossy, with lower back and upper breast black, paler flight-feathers below; female is like male, but black replaced by darkish brown, underparts dull whitish. Male "*opistholeuca*" resembles *O. leucura*, but smaller and smaller-headed, with brownish flight-feathers, slightly more white on lower back; female like male, but black replaced by sooty-brown, and has warm brown to chestnut ear-coverts. Male "*capistrata*" best distinguished from extremely similar male *O. pleschanka* by often purer white crown, narrower terminal tailband with less black on outermost rectrix; non-breeding male has paler flight-feathers below, less white scaling on throat and mantle; female is usually warmer brown above than female *O. pleschanka*. Juvenile resembles female, but with broader buff wing edges above, vague buffy scaling below. Voice. Song, from prominent vantage (such as rock, telephone wire or rooftop), occasionally in flight, is scratchy and less pleasant than that of *O. albonigra* and softer than that of *O. isabellina*, contains low-pitched "chott" calls, whistles, chirrups and trills, with much excellent mimicry; given also in evening in autumn, at start of winter-territory occupation. Young male in Nov heard to give subsong consisting of soft trills, warbles and thin long whistles. Call a loud "chek-chek" in warning.
Habitat. Inhabits highly weathered low mountains (below c. 700 m) among sand deserts with grass vegetation in N of range (e.g. Kyzyl Kum, Vakhsh Valley); stony outcrops of the arid foothills of Pamir–Alai Mts, and clay canyons formed by dried-up rivers in S parts of Uzbekistan and Tadjikistan. Form "*capistrata*" is practically absent in Pamir–Alai system above 1500 m, where replaced by the "*opistholeuca*" populations occupying montane landscapes. On Iranian plateau and in adjoining mountain systems (Zagros, Elburz and Kopet-Dag) "*picata*" occurs in foothills to 2100–2400 m (occasionally up to 2700m). Breeds at 1800–2400 m in Pakistan. On wintering grounds found in open rocky areas in deserts and sparsely vegetated areas, also in cultivations; brick kilns (both working and abandoned ones) much favoured in alluvial plains of Punjab, in NW India. Territorial in winter, keeping to same small area throughout.
Food and Feeding. Small insects, notably ants, small beetles, flies and small grasshoppers, also largers insects, e.g. moths; occasionally also fruit of *Ficus* and berries of *Grewia*. Caterpillars seen brought to nestlings. Prey pursued very actively on ground, in air and from low rock perch. Seen to pursue large moths, including hawkmoths (Sphingidae), in flight.
Breeding. Mar–Jun in C Asia; Jun–Jul in Afghanistan and third week Mar to Jul in Pakistan; double-brooded. Territory 2–3 ha in NE of range (Kopet-Dag, Badhyz), average 0·5–1 ha (maximum 3 ha) in semi-desert in Kyzyl Kum and S Uzbekistan, average c. 2 ha in Pamir–Alai Mts; same territory can be occupied in successive years by males of different phenotypes. At start of nest-building female brings numerous flat stones to nest-site (one collected stones from bed of a ravine c. 50 m from site, during 8 minutes delivered 18 stones weighing 1 g to 18 g); nest a bulky, flat cup of grass stems, feathers, animal hair and wool, well concealed in hole in rocks, cliff, wall or bank, under flat stone on rocky slope or in burrow; once under a brushwood-and-mud thatch roof, once in mound of silt excavated from well, once in wood stack, once in tree hole. Eggs 4–7, pale blue with sparse reddish-brown speckles; incubation period 12–13 days; nestling period 13–14 days. In study of 20 nests in range occupied by "*picata*" morph, 95 eggs hatched and mortality of nestlings was 8·2%; of ten nests in range of "*capistrata*" × "*opistholeuca*" populations, unhatched eggs found in five nests and comprised 9·4% of total laid; main nest predators are small snakes and foxes, and in one instance a lizard (Khorasan rock agama) was found in a nest where one nestling dead and another dying.
Movements. Migratory. Early autumn migrant in S Pakistan (Sind), arriving early Aug, and departing end Feb. Non-breeding visitor in UAE, Sept–Mar. Vagrant in E Saudi Arabia.
Status and Conservation. Not globally threatened. Common in C Asia. Commonest and most widespread wheatear in plains of Pakistan in winter; fairly common in NW India in winter. Breeding density up to 15 pairs/km² in almost unvegetated areas in NE of range. Formerly believed to breed in Jordan, but population there now known to be black morph of *O. lugens*.
Bibliography. Ali & Ripley (1987b), Cramp (1988), Dementiev *et al.* (1968), Dharmakumarsinhji (1955), Farrow (1990), Flint *et al.* (1984), Fry & Erikson (1989), Grabovsky (1994), Grimmett *et al.* (1998), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Keith *et al.* (1992), Kostina & Panov (1981), Loskot & Vietinghoff-Scheel (1980a), MacKinnon & Phillipps (2000), Meyer de Schauensee (1984), Paludan (1959), Panov (1980, 1992, 1999), Panov *et al.* (1993), Porter *et al.* (1996), Raol (1968), Rasmussen & Anderton (2005), Richardson (1990, 1999), Roberts (1992), Ticehurst (1922, 1927), Vaurie (1949, 1972), Zykova & Panov (1982).

319. Pied Wheatear

Oenanthe pleschanka

French: Traquet pie **German**: Nonnensteinschmätzer **Spanish**: Collalba Pía
Other common names: Common Pied Wheatear, Pleschanka's Wheatear

Taxonomy. *Motacilla pleschanka* Lepechin, 1770, Saratov, lower Volga, south-west Russia.
Has been treated under name *O. leucomela*, but current name has priority. Probably forms a superspecies with *O. cypriaca*; formerly considered conspecific, but vocally very different. Sometimes considered conspecific with *O. hispanica*; the two hybridize where breeding ranges overlap, with no evidence of assortative mating, and possibly better reunited as one species. Monotypic.
Distribution. SE Europe E, discontinuously, to S Urals, Transbaikalia, C & W Afghanistan, N Pakistan, NW Himalayas and N China; non-breeding NE Africa and SW Arabian Peninsula.



Descriptive notes. 14·5–16 cm; 16–22 g. Male breeding has white crown (through eye) to nape and around rear ear-coverts, mid-crown sullied buff-grey in fresh plumage; black face to upper breast extending onto mantle, upper back and wings; white lower back to tail, latter with black central feathers, terminal bar and distal outermost feathers (terminal band variable in amount of black at tip and in extent across whole tail); white rest of underparts, with peach-buff tinge on breast; black bill and legs. Form "*vittata*" (2·8% of population across whole range) has white throat. Non-breeding male is as breeding, but head to nape dull greyish-buff (pale buff along line adjoining blackish face), black parts browner, wings fringed buff, division between upper and lower breast less clear-cut, lower underparts stained ochre. Breeding female is greyish-brown above and to breast (latter slightly streaked), with vague buff supercilium, slightly chestnut-tinged ear-coverts, breast shading whitish to vent; non-breeding female paler, with pale throat, buff scaling on back, extensive whitish-buff wing edgings. Juvenile is very like non-breeding female, but buff-spotted and scaled above, dark-scaled below. Voice. Song, often in high circling display-flight (ends in remarkable plunge to earth), a series of very short, monotonous buzzy trilling phrases consisting of c. 3 notes, "tri-tri-trrriii" or "géretchírétchö", with slight variations, sometimes with much mimicry, and sometimes extended into more continuous delivery. Subsong also involves much mimicry, but is protracted and with muffled clicking sounds. Calls include harsh "zack", clear loud click, soft buzzy "perrt" or "gzzyut" (rapid sequence of clicks) in alarm, whistled "psjiep" in high-intensity aggressive and courtship contexts, and brief musical "susít".
Habitat. Arid rocky desolate semi-desert, desert stony stretches with scattered boulders, stony slopes, rocky outcrops, lightly wooded slopes, hilly pastures and fallow fields in flat and undulating steppe country, riverbanks, gulleys, crags and cliffs; to 3500 m in E of range on boulder-strewn plateaux above tree-line, often with *Caragana* and *Halimodendron* bushes, but also in lower montane valleys in Mongolia. In Pakistan preferred breeding habitat is rather open, flat, stony slopes or valley bottoms, bushless and boulder-strewn. In African winter quarters, frequents bush-dotted and tree-dotted plains, montane moorland, woodland fringes, cultivation and sometimes burnt-over areas; generally prefers less arid country, and perches more in trees and bushes, compared with many congeners; mainly 1200–2000 m in Somalia and Kenya.
Food and Feeding. Invertebrates, mainly ants and beetles, supplemented with fruit in autumn. Animal food includes beetles of at least six families, ants and ichneumon flies, flies, moths, grasshoppers, crickets, ant-lion larvae, termites, bugs, earwigs, damselflies, spiders, mites, woodlice, centipedes, millipedes and snails (small lizard seen taken to nest, but vertebrate food not otherwise reported). Plant food includes fruits and berries of wild cherry (*Prunus*), mulberry (*Morus*), pistachio (*Pistacia*) and seeds. Of 16 stomachs of spring migrants from Saudi Arabia, Jan–Apr, all held ants and beetles, half held non-ant hymenopterans, seven contained flies, four held bugs; mites, ant-lion larvae, adult and larval lepidopterans, spiders and seeds featured weakly. Stomachs of six birds from SW Iran, Mar, held 50% by number ants, 22% beetles, 5% bugs, 3% insect larvae, 2% woodlice, 1% dragonflies, 1% grasshoppers, rest unidentified; 11 stomachs, Nov, held 41% beetles, 16% ants, 12% bugs, 8% termites, 4% other hymenopterans, 4% spiders, 2% insect larvae, 1% mites, 1% seeds, rest unidentified. Diet in Ukraine (24 stomachs), May–Jun, was 62% ants, 20% beetles, 8% other hymenopterans, 6% caterpillars, 4% others. Of 20 stomachs from SE Turkmenistan, 85% contained beetles, 60% caterpillars, 50% ants; of 236 items, 55% were ants, 22% caterpillars, 14% beetles, 6% bugs, 3% myriapods, grasshoppers and spiders. Food brought to nestlings in-

cludes adult and larval insects, and adult seen carrying small lizard. In Africa, beetles, ants, bees and wasps, fly larvae, bugs, ant-lions, butterflies, moths and caterpillars, grasshoppers, mites, spiders and seeds recorded. Forages mainly by scanning from bush or rock perch and flying down onto terrestrial prey; also hunts on ground, sallies after flying insects, and gleans from leaves: in Kenya, 64% of 100 prey taken on ground (presumably using first two methods), 30% in flight and 6% from bushes. When in competition with *O. oenanthe* and *O. isabellina*, tends to use more aerial sallying and perch-and-pounce methods, which allow greater opportunity for escape from congeners' attacks. Low weight and long tail permits greater use of plant stems as perches; of 66 perches in Iran, 45% on plant, 20% on stones or clods, 20% on ground, 15% on boulders or outcrops. Individual feeding territory in winter 0·8 ha, smaller than those of above-mentioned congeners; also, stronger aggression shown towards same sex than towards opposite sex, suggesting some sexual food-niche separation.

Breeding. From early May in Ukraine; May–Jun in Afghanistan, to Aug in N Pakistan; main fledging period in Russia (Altai) last third Jun, and in Pamir–Alai early to late Jul; display mid-May, nest-building late May, incubation early Jun and fledged young Jun–Jul in Mongolia; one brood, possibly two in W of range. Territories often relatively small, especially in high-density areas, some only 0·3 ha, and in Ukraine no more than 40–60 m across, although nests and pairs generally 100 m apart; often loose colonies of 2–4 pairs, each with territory of 1–3 ha (average c. 2 ha), in Tuva (C Siberia) mean distance between nests 126 m, minimum 40 m. Nest a loose flat cup of coarse plant stems and rootlets, lined with fine stems, animal hair and wool, typically with base and/or entrance platform of small twigs, placed in small cavity under stone, or in wall of gulley, bank or building; in Transbaikalia 35 out of 37 nests were in rock cavities and crevices, and two in burrows of long-tailed souslik (*Citellus undulatus*); in plains of Zaisan Depression, in SE Kazakhstan, twelve of 15 were in holes in gullies and earth walls up to 1-2·5 m above ground. Eggs 4–6, pale blue to green-blue with small reddish-brown speckles; incubation period 13–14 days; nestling period 13–14 days; post-fledging dependence reportedly 5–7 days, but this seems anomalously short (possibly refers to period between fledging of first brood and initiation of second brood). In Transbaikalia, 92 eggs produced 77 nestlings, of which six perished.

Movements. Migratory. Leaves breeding grounds Aug to late Oct, latest in Mongolia early Sept; in Kazakhstan departs from N and high-elevation sites Aug–Sept, from S in Sept to early Oct. Migrates on broad front, E populations presumably initially in a W or WSW direction towards Caspian Basin, with passage through Afghanistan (rare), Iran (common and widespread), Iraq and Turkey Sept–Oct, and Israel mainly Oct; variable numbers in E Saudi Arabia Sept to early Nov; uncommon in UAE mid-Sept to early Nov; variable in Bahrain, mainly late Sept to mid-Oct. Winters Africa (mainly E of R Nile) from Egypt S to N Tanzania, and in SW Arabia. Influx into Egypt late Oct to early Nov; peak passage late Sept and Oct in Somalia, reaching Sudan Oct and Kenya mid-Oct. Present in winter quarters late Sept to May, mainly Oct–Mar. Last spring leavers in Kenya early Apr and in Eritrea early May, but spring passage in Egypt mainly mid-Mar to mid-Apr, Israel and Turkey mainly end Mar to mid-Apr, Iraq Mar–Apr; common in E Arabia Feb to early Apr, mainly Mar in Bahrain and Oman; S Pakistan and Afghanistan mainly Mar–Apr. First arrivals on breeding grounds mid-Mar to late Mar, middle to late Apr in N Kazakhstan, late arrivals until mid-May in Mongolia and N China (earliest from end Mar). Early arrivals in far E of breeding range suggest early departure from Africa, and raise possibility that some may not travel full distance. Widely recorded as vagrant, e.g. in W Europe, South Africa and elsewhere.

Status and Conservation. Not globally threatened. European population in mid-1990s estimated at 2601–5714 pairs, with additional 100,000–1,000,000 pairs in Russia and 50–1000 pairs in Turkey; by 2000 total European population (including European Russia and Turkey) revised to 32,000–140,000 pairs and considered generally stable. Range may be expanding in SE Europe. Even in optimal habitat densities only 0·15 pair/ha (15 pairs/km²), considerably lower than those of many congeners; nevertheless, much the commonest wheatear in Kirgizstan. Fairly common in China. In non-breeding areas, common to abundant in NE & E Africa (but largely absent from coastal strip), becoming scarcer in W Kenya, Uganda and N Tanzania; commonest wheatear below 2500 m on high plateaux in Somalia.

Bibliography. Adamian & Klem (1997, 1999), Ali & Ripley (1987b), Anon. (2004e), Arlettaz *et al.* (1992), Ash (1980), Baumgart *et al.* (1995), Beaman & Madge (1998), Britton (1980), Bundy (1976), Bundy *et al.* (1989), Cave & MacDonald (1955), Cheng Tsohsin (1987), Cramp (1988), Eggebrecht (1943), Étchécopar & Hüe (1964), Gallagher & Woodcock (1980), Glutz von Blotzheim & Bauer (1988), Goodman *et al.* (1989), Grabovsky & Panov (1992), Grabovsky *et al.* (1992), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Kasparek (1992), Keith *et al.* (1992), Kneis & Spretke (1985), Kumerloeve (1969), Lee Woo-Shin *et al.* (2000), Leisler *et al.* (1983), Lewis & Pomeroy (1989), Loskot (1986), MacKinnon & Phillipps (2000), Mauersberger (1980), Meyer de Schauensee (1984), Morrison (1945), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Panov (1986, 1999), Piechocki *et al.* (1982), Portenko & Vietinghoff-Scheel (1967, 1984), Porter *et al.* (1996), Rasmussen & Anderton (2005), Richardson (1990), Roberts (1992), Roselaar (1995), Rubtsov (1995), Schmidl (1982), Shirihai (1996), Sinclair (1984), Sinclair & Ryan (2003), Sinclair *et al.* (1986), Tomek (2002), Ullman (1992, 1994), Vaurie (1949, 1972), Wassink (2004), Welch & Welch (1984), Zheng Guangmei & Zhang Cizu (2002), Zimmerman *et al.* (1996).

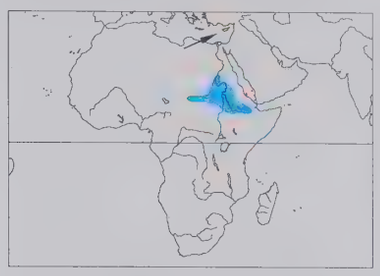
320. Cyprus Wheatear

Oenanthe cypriaca

French: Traquet de Chypre **German**: Zypernsteinschmätzer **Spanish**: Collalba Chipriota
Other common names: Cyprus Pied Wheatear

Taxonomy. *Saxicola cypriaca* Homeyer, 1884, Cyprus.
Probably forms a superspecies with *O. pleschanka*; formerly considered conspecific, but vocally very different. Monotypic.

Distribution. Cyprus; non-breeding NE Africa.



Descriptive notes. 13·5 cm. Breeding male is very like *O. pleschanka*, but shorter-winged and shorter-tailed, with broader black terminal tailband, less white on nape and lower back, crown usually tinged greyish, more extensive ochre tinge on underparts; non-breeding male like equivalent *O. pleschanka*, but deep yellow-ochre below. Breeding female is slightly duller than male, crown mostly brown, whitish forehead extending as supercilium to behind ear-coverts, upperparts dark brown; non-breeding female and first-winter male like breeding female, but slightly paler, less contrastingly marked on head. Juvenile is like female, but mottled buff and brown on head, back and breast. Voice. Song, from relatively high position such as treetop, but also building, boulder or wire (59% in one study 5–10 m above ground), a series of phrases consisting of rapid buzzes, 3–6 per second over 2–10 seconds, "zz-zz-zz-zz-zz-zz-zz-zz-zz-zz...", very different from that of *O. pleschanka*. Call a hard "chak"; female with brood has thin piping alarm reminiscent of call of Bullfinch (*Pyrrhula pyrrhula*), possibly short whistled "dj'ui" reported for high-intensity aggressive and courtship contexts.

Habitat. Wide variety of habitats, including mountain pine forest clearings, hills and mountains with rough open ground and scattered trees, broken rocky ground, open natural and farmed lowlands, woodland and plantations, gardens, industrial and suburban areas, house compounds. On passage in vegetated wadis, tree-lined agriculture. In winter usually in open country with scattered bushes.

Food and Feeding. Insects, including caterpillars. Food brought to nestlings in one instance a small lizard.

Breeding. Apr–Jul, c. 3 weeks earlier at lower elevations than at higher ones; commonly double-brooded. One territory 3·3 ha, with core 0·6 ha. Nest a loose bulky cup of grass and roots, placed low down in hole in earth bank, stone or mud wall, terrace, roadside, tree, behind loose eucalypt bark and under stone, also in cave; in areas with high human influence also artifical sites, e.g. metal pipe, empty can, flowerpot, shed shelves, old peg-bag hanging on clothes line, nestbox, in slagheap, down mine-shaft. Eggs 4–5, light blue with warm red-brown spots; incubation period 13 days; nestling period 13–15 days.

Movements. Migratory. Autumn departure involves descent to coastal areas in Aug–Oct (possibly after first moving to higher areas), immediately prior to migration, with main departure end Aug and Sept, latest individuals early Nov. Passage through S Israel, Jordan and Egypt Oct–Nov, some reaching Syria; apparently winters in Sudan and Ethiopia, also EC Chad (uncommon), during Nov–Mar; spring return in Egypt mid-Mar to mid-Apr, but in Israel mainly middle two weeks Mar. Some arrive Cyprus as early as Feb, most in Mar, with main arrival late Mar. Records of birds trapped by bird-limers revealed that males arrive 1–2 weeks before females. Regular overshooting migrant in S Turkey in spring. Two individuals ringed as chicks retrapped in following year at natal site.

Status and Conservation. Not globally threatened. Restricted-range species: present in Cyprus EBA. Abundant and widespread, but commonest in hills and mountains (where 4–5 singing males can be heard from a single point) and least common on C plain. Total population in mid-1990s estimated at 3000–7000 pairs, but by 2000 this dramatically revised to 90.000–180,000 pairs, with numbers considered stable. Only known threat to this adaptable species in Cyprus is from bird-catchers; enforcement of laws against trapping a much-needed conservation measure, along with a system of monitoring the situation (and the species' population).

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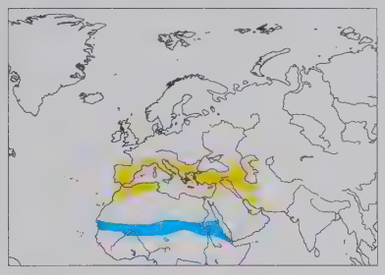

pale-throated
dark-throated
ssp melanoleuca
321
322
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ssp hispanica
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ssp bottae
ssp frenata
329
330
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332
333
ssp leschenaulti
334
335
ssp sinensis
336
ssp maculatus
ssp robinsoni
PLATE 81
inches
4
cm
10

321. Black-eared Wheatear

Oenanthe hispanica

French: Traquet oreillard **German**: Mittelmeer-Steinschmätzer **Spanish**: Collalba Rubia
Other common names: Black-throated Wheatear; Spanish (Black-throated) Wheatear (*hispanica*)

Taxonomy. *Motacilla hispanica* Linnaeus, 1758, Gibraltar.
Sometimes considered conspecific with *O. pleschanka*; the two hybridize where breeding ranges overlap, with no evidence of assortative mating, and may be better reunited as one species. Race *melanoleuca* fairly distinct, but intergrades with nominate (amount of black on mask/throat increases from W to E). Two subspecies recognized.
Subspecies and Distribution.
O. h. hispanica (Linnaeus, 1758) – SW & SC Europe (E to Italy and Croatia) and NW Africa; non-breeding W African Sahel.
O. h. melanoleuca (Güldenstädt, 1775) – SC & SE Europe, Asia Minor and Levant E to Caspian Sea, SW Kazakhstan and N, W & S Iran; non-breeding C & E Sahel and NE Africa.



Descriptive notes. 13·5–15·5 cm; 12–21 g. Both sexes of both races occur as two morphs, one having a narrow dark mask with the rest of the face and throat pale, the other a dark face and throat; proportion of black-throated males increases with E progression, from 42–52% in N Africa to c. 80% in Transcaucasia. Breeding male nominate race is yellowish-ochre from crown to back and breast, with narrow white border separating this from black mask/face and scapulars to wings; lower back to tail white, latter with black central feathers, narrow (sometimes broader) terminal bar and distal outer feathers; underparts below breast white or sandy-white; bill and legs black. Non-breeding male has hoary mask/face and and two creamy wingbars. Breeding female has male pattern, but black of mask/face and wings replaced by blackish-brown with buff edging, crown more saturated; non-breeding female similar but with heavy orange-buff wing edging, orange-buff breast, no dark mask/face. Juvenile is like non-breeding female, but vague barring on back, scaling and stippling on breast. Race *melanoleuca* differs from nominate in having much less yellow-ochre tinge, appearing mainly black and white, with black of mask/face extending slightly above bill, non-breeding male colder (pale grey-brown) above than nominate, female as nominate but greyer and duller in all plumages. Voice. Song of two types: one a series of short (1–3 seconds) phrases with intervals of 2–7 seconds, each phrase sputtering into explosive scratchy jumble of whistles, sometimes with mimicry, sometimes given in flight, even in total darkness 1–2 hours before dawn; second type (given also in winter quarters) a long-sustained phrase of jumbled whistles with call notes interpolated. Subsong, given in autumn and in courtship, consists of quiet rambling twittering and warbling, often with much mimicry. Calls include "tack", singly or in rapid irregular series, and a plaintive whistled "wiii" or "fiüid", the two often in combination as "wiii-tack"; also a buzzing "biiizh" or "trrrrt" when threatened.
Habitat. Breeds in warm climatic zone in stony, scrubby, often broken terrain (slopes and foothills) around open woodland of alerce (*Tetraclinis*), juniper (*Juniperus*) or oak (*Quercus*), amid *Olea* and *Pistacia* scrub, olive trees, cactus groves, and in fallowland, vineyards, dry maquis steppe and shrub-covered limestone hills. In Europe mostly up to 1200 m (occasionally to 2300 m, once 3000 m), and in S an ecological substitute for higher-elevation *O. oenanthe*; key habitat requirements are low vegetation cover incorporating large proportion of bare ground with shrubs (*Thymus*, *Lavandula*, *Salvia*, etc.; in Armenia *Artemisia*, *Euphorbia*, *Atraphaxis* and *Acantholimon*). In many areas in S Transcaucasia, breeds on dry slopes of low mountains, mainly among stony or clay foothills often almost devoid of vegetation, with concentration in shallow wadis and gulleys. In SW Iran, breeds at 1800–2500 m in varied habitats which receive more than 400 mm rainfall per year; usually in richer vegetation than congeners, including strong spring herb flush, small shrubs, bushes and occasional open stands of oak and juniper. In African winter quarters generally in less arid land than *O. oenanthe* or *O. isabellina*, preferring relatively dense acacia savanna, thorn-scrub, wadis, oases, cropfields, gardens, ruins, dry riverbanks and burnt-over ground; to 2000 m in Ethiopia.
Food and Feeding. Invertebrates, berries and seeds. In Europe mainly hymenopterans, coleopterans and lepidopteran larvae. In SE Spain, main food in spring and summer ants, beetles and grasshoppers (these last and heteropteran bugs positively selected), both numerically and by mass, with prey size smallest at mid-summer, when main prey worker ants, largest in spring and late summer; caper berries (*Capparis spinosa*) main (but still minor) vegetable component. Animal food 3–12 mm long, includes beetles of at least 19 families, lepidopterans of at least ten families, bugs of at least eleven families, flies of at least four families, ants, bees and ichneumons, grasshoppers, crickets and bush-crickets, mantises, mayflies, dragonflies, lacewings, spiders, harvestmen, woodlice, millipedes, centipedes and snails. Plant food includes fruits and berries of mulberry (*Morus*), blackberry (*Rubus*), cherry (*Prunus*), sumach (*Rhus*) and daphne (*Daphne*). In SW Iran, eleven stomachs from Mar–Oct yielded 135 items of which, by number, 42% were ants, 14% beetles, 13% bugs, 7% insect larvae, 7% bees and wasps, 5% other hymenopterans, and 12% others or unidentified; size of prey falling from 5–10 mm in Mar–Jun to 2–5 mm in Jul–Oct. In Caucasus, Apr–Jun, 931 items from 47 stomachs comprised, by number, 29% ants, 23% beetles, 13% lepidopterans, 12% bugs, 7% flies, 7% grasshoppers, 5% other hymenopterans, 4% others, but after May mulberries became important supplement. Nestling food mainly caterpillars, grasshoppers, beetles, spiders, flies and adult lepidopterans; in one study in Caucasus, chicks 6–10 days old fed with significant proportion of small cherries; in C Italy grasshoppers (52%) and spiders (13%) most frequent prey brought to nestlings. In African winter quarters, ants, beetles, bugs (including strong-smelling species), mayflies (caught at swarms), larvae, grasshoppers, snails, worms, woodlice, mites, berries and seeds. Lighter weight allows use of flexible perches not available to heavier congeners: of 241 perches used in SW Iran, 40% on vegetation, 35% on boulders or outcrops, 15% on ground and 10% on stones or clods; fairly commonly hovers to forage when wind available and ground-cover dense. Habitually perches higher than *O. oenanthe* or *O. isabellina*, using trees and telegraph wires as well as bushes, rocks and fences. Forages from perches up to 3 m above ground in typical wheatear fashion, flying to ground to take prey, bounding over ground to grab prey, and sallying after flying insects. In breeding season male forages from higher perch than female, but foraging posts of both sexes increase in height with season.
Breeding. Mar–Jun in NW Africa; from late Apr in Spain (most clutches laid second half May), from early May in Greece; early Apr to mid-Jul in Israel; from late Apr or early May in Armenia; May–Jun in E of range; often double-brooded in W of range, but most pairs single-brooded in Israel and in NE. Some males polygynous in C Italy. Territory c. 1·7 ha in optimal habitat, sometimes as little as 1 ha; inter-nest distance usually at least 200 m, sometimes 80–100 m, in Israel once 60 m. Nest a rather flat cup of stems, moss and fibres, lined with hair or down, placed on ground under stone, rocky overhang or tussock, among scree, in burrow or hole in ruin or wadi bank, quantity of thin twigs (from five to 182) placed at entrance and around nest; in W of range usually placed on ground under thick bush (*Genista scorpios*, *Lavandula*, *Thymus*, *Juniperus communis*), with tunnel up to 10 cm long leading to nest-chamber, tunnel floor covered with rather large sticks, with smaller ones at base of nest and around it. Eggs 3–6, mainly 4–5, pale blue or greenish-blue with reddish-brown spots and lilac blotches; incubation period 13–14 days; nestling period 11–14 days; post-fledging dependence 9–12 days (in W) or 20–22 days (in E); if two broods, construction of second nest may start while fledglings still dependent. In C Italy, 2·58 juveniles per pair, with 27·5% of clutches lost to predation and 7·5% to storms; in Armenia red fox (*Vulpes vulpes*) a major nest predator.
Movements. Migratory. Moves on broad front across Mediterranean and Sahara, wintering in African Sahel, with two main areas of abundance: S Mauritania E to C Mali (nominate race), and C Chad and C Sudan (*melanoleuca*). N African populations depart mainly late Aug and Sept, with passage (also involving more N breeders) mainly Sept–Oct. Leaves breeding grounds in C Italy mid-Aug, and passage in Malta extends from early Aug to early Oct; in Pyrenees females leave later than males. E populations quit breeding grounds Aug–Sept, with passage Iraq mid-Sept to mid-Oct, Turkey Aug–Oct, UAE Oct–Nov; Israel mainly Sept–Oct (breeders depart mainly Aug). Arrives in Sahel region from Sept, many not until Oct; both races occur together in E Mali region. Spring departure from Senegal Apr, Mauritania Apr–May, Mali and Niger Mar-Apr, Chad Jan–Mar, with more marked passage in spring than in autumn in Morocco, Libya/Egypt and Cyprus, chiefly late Mar and Apr; in Cyprus, evidence from bird-limers reveals that 50% males had passed by first week Apr, 50% females by third week Apr. Passage and arrival in Israel mainly Mar–Apr; passage in UAE Mar to mid-Apr; Spring arrival on breeding grounds in W Mediterranean mainly Apr (passage up to early May in SW Spain), but in Greece late Mar and Iran early Apr; as early as late Mar or early Apr also in Armenia and Azerbaijan. Vagrants recorded in N Europe.
Status and Conservation. Not globally threatened. Population in Europe (50% of global total) in mid-1990s estimated at 641,403–790,042 pairs (of which 513,000–620,000 in Spain), with additional 50,000–500,000 pairs in Turkey, where most abundant on lower slopes and hills of W & S. By 2000 total European population (including Turkey) revised to 1,400,000–3,300,000 pairs and considered generally stable. Densities in Spain exceptionally reach 0·26–0·38 pairs/ha (26–38 pairs/km²) but more typically range between 0·05 and 0·19 pairs/ha in mixed juniper habitats: in C Italy as low as 0·025 pairs/ha (2·5 pairs/km²) in optimal habitat, but 0·04–2·6 pairs/ha (4–25 pairs/km²) in Azerbaijan. Common in Morocco and Tunisia, in latter most numerous in coastal areas. Common in C & N Israel, with total population estimated at a few thousands of pairs in 1980s; fairly common in highlands of Jordan. Common in Armenia. Breeding numbers in E Europe stable. In W Europe has declined markedly since 1970, particularly in Spain, where nationally red-listed as "Near-threatened", and range has contracted S in S France and C Italy; drought in winter quarters and agricultural intensification held responsible, as the species is known to be sensitive to minor changes in habitat, including afforestation schemes and steady abandonment of low-intensity farming. In winter frequent to common, S Mauritania, where 190,000 birds estimated to winter in 76,000 km², with c. 2·5 birds/km².
Bibliography. Adamian & Klem (1997, 1999), Andrews (1995), Anon. (2004e), Backhurst *et al.* (1984), Barlow *et al.* (1997), Baumgart *et al.* (1995), Beaman & Madge (1998), Borrow & Demey (2001), Brosset (1961), Browne (1982), Bundy (1976), Bundy *et al.* (1989), Cave & MacDonald (1955), Cramp (1988), Dementiev *et al.* (1968), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Glutz von Blotzheim & Bauer (1988), Goodman *et al.* (1989), Grabovsky & Panov (1992), Grabovsky *et al.* (1992), Guerrieri *et al.* (2001), Haas *et al.* (1987), Haffer (1977), Hagemeijer & Blair (1997), Hernando (2001, 2003), Hirschfeld (1995), Hódar (1998a), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Kasparek (1992), Keith *et al.* (1992), Ledant *et al.* (1981), Loskot (1986), Mestre *et al.* (1987), Moreau (1961), Morel & Morel (1990), Neff (1990), Nightingale & Hill (1993), Nikolaus (1987), Panov (1986, 1999), Panov *et al.* (1994), Paz (1987), Pineau & Giraud-Audine (1979), Portenko & Vietinghoff-Scheel (1967, 1984), Porter *et al.* (1996), Richardson (1990), Roselaar (1995), Rubtsov (1995), Salvan (1964, 1968), Santos & Suárez (1985), Sharland (1967), Shirihai (1996), Sinclair & Ryan (2003), Suárez (1990, 1991, 1994), Suárez & Manrique (1992), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Ticehurst (1927), Ullman (1992, 1994, 2003, 2004), Vaurie (1949).

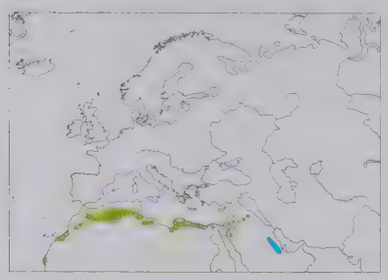
322. Buff-rumped Wheatear

Oenanthe moesta

French: Traquet à tête grise **German**: Fahlbürzel-Steinschmätzer **Spanish**: Collalba Culirroja
Other common names: Red-rumped/Tristram's Wheatear

Taxonomy. *Saxicola moesta* M. H. K. Lichtenstein, 1823, between Bir Hamam and Gassr Eschtaebi, Egypt.
Varies clinally in colour and size across N Africa, from large, dark birds in W (described as race *theresae*) to smaller, paler, greyer ones in Egypt; birds E from NE Egypt (Sinai) named as race *brooksbanki*, but distinctions very slight and/or inconstant, and some probably clinal. Treated as monotypic.
Distribution. N Africa E to NE Egypt (Sinai) and from S Syria S to Israel and NW Saudi Arabia and E to W Iraq; non-breeding also C Arabia.
Descriptive notes. 14·5–16 cm. Breeding male is pale grey on crown to nape, shading to black on mantle, with white forehead through supercilium to rear ear-coverts, black face (through eye) to throat and neck side (continuing on scapulars), white-edged blackish wings with two narrow white wingbars, pinkish-buff rump shading to rufous on uppertail-coverts and basal outer tail, distal half of tail black (no inverted T-pattern); breast to belly whitish, vent buffy-rufous; bill and legs black. Non-breeding male is dark grey on scapulars and back. Breeding female has pale rufous head merging into greyer back, very narrow wingbars, with rump and tail as male but more rufous in outer tail (short inverted "T"), dull greyish-white below, with brighter indistinct submoustachial

On following pages: 323. Chestnut-rumped Wheatear (*Oenanthe xanthoprymna*); 324. Rusty-tailed Wheatear (*Oenanthe chrysopygia*); 325. Desert Wheatear (*Oenanthe deserti*); 326. Capped Wheatear (*Oenanthe pileata*); 327. Isabelline Wheatear (*Oenanthe isabellina*); 328. Buff-breasted Wheatear (*Oenanthe bottae*); 329. Heuglin's Wheatear (*Oenanthe heuglini*); 330. Little Forktail (*Enicurus scouleri*); 331. Sunda Forktail (*Enicurus velatus*); 332. Chestnut-naped Forktail (*Enicurus ruficapillus*); 333. Black-backed Forktail (*Enicurus immaculatus*); 334. Slaty-backed Forktail (*Enicurus schistaceus*); 335. White-crowned Forktail (*Enicurus leschenaulti*); 336. Spotted Forktail (*Enicurus maculatus*).



and vague rufous tinges on breast side and lower flanks; non-breeding female has stronger buffy-rufous wing edging. Juvenile is like non-breeding female, but head paler, back spotted buff, underparts lightly scaled brown; first-winter female as adult, but paler on head and face. VOICE. Song, apparently by both sexes (male thought to perform more), a series of phrases each lasting 6–8 seconds and consisting of several "tlik" notes, then 12–13 distinctive whirring trills at successively higher pitch, "tlik, tlik, tlik truuuuii truuuuiii truuuuiii truuuuiii…". Courtship song a long-drawn, wavering, warbling whistle, rising in pitch and likened to a whistling kettle coming to boil, "whiirwhiirwhiirwhiirwhiir…", usually given in antiphonal duet as partner reaches top during leap-frogging ceremony. Subsong a curious sequence of creaking sounds, by both sexes, often interspersed with contact-alarm calls. Calls include "tlik", "chack" or "prrup" in contact-alarm, sometimes run together in rapid irregular series, and melodious "keeyup" in high alarm, these two sometimes used together.

Habitat. Breeds in bush-clad desert fringes and flat dry saline steppe with low plant cover including *Artemisia* and Chenopodiaceae, and dotted with rodent burrows. In N Africa low-lying, flat or gently sloping sandy, stony and clay semi-desert plains (reaching shoreline on Atlantic coast) with sparse, low bushes (e.g. *Euphorbia*, *Artemisia*, *Argania*, *Atriplex*, *Nitraria*), also in dry lakebeds and saltflats, mostly avoiding fields, rocky areas, dissected terrain and, in Tunisia at least, coastal plains; relatively densely bushed desert may be optimal. Where sympatric with *O. deserti*, displaced into poorer areas.

Food and Feeding. In N Africa beetles, caterpillars up to 5 cm, grasshoppers, ants, and occasionally green plant material. Most items brought by one pair to nestlings were a pale form of the scorpion *Scorpio maurus*. Forages by perch-and-pounce method from low stem, and bound-and-grab method on ground; on Atlantic coast of Morocco observed to feed in intertidal zone.

Breeding. Late Jan to early Jun, mainly Apr and early May, in Morocco; late Feb to mid-Jun in Algeria; Mar–Apr in Sinai; Feb–Mar (first brood) in Israel; often double-brooded. In N Africa some pairs maintain joint territory all year. Nest a cup of leaves, rootlets and stems, lined with wool, hair, feathers and/or snakeskin, placed up to 2 m deep in rodent (*Psammomys*, *Meriones*) hole in ground or earth bank, sometimes under stones or in hole in wall. Eggs 4–5 (2–4 in Algeria), whitish to whitish-blue with sparse reddish-brown spotting; incubation period 14–15 days; nestling period c. 15 days; post-fledging dependence c. 3 weeks.

Movements. Sedentary and partial local migrant. Main periods of movement Aug–Sept and Feb–Apr; in E Morocco most move S in winter, and in Tunisia rarer in winter than in Mar. Some E breeders migrate to C Arabia.

Status and Conservation. Not globally threatened. In N Africa patchily distributed but locally common; in Morocco distributed in three separate areas, in each of which common. Rather scarce in Tunisia. Fairly common along N coast of Egypt (one record of 12 males singing within "half a mile", i.e. c. 800 m), but Sinai population either extremely small or extinct. Extremely rare breeding resident in Israel; local in Jordan.

Bibliography. Andrews (1995), Bates (1936), Baumgart *et al.* (1995), Beaman & Madge (1998), Blondel (1962), Bundy (1976), Cramp (1988), Étchécopar & Hüe (1964), Glimmerveen & Hols (1986), Goodman *et al.* (1989), Heim de Balsac & Mayaud (1962), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Isenmann & Moali (2000), Jarry (1969), Kasparek (1992), Keith *et al.* (1992), Knight *et al.* (1973), Ledant *et al.* (1981), Panov (1999), Paz (1987), Porter *et al.* (1996), Roselaar (1995), Shirihai (1996), Short & Horne (1981), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Vaurie (1955b), Vietinghoff-Scheel (1974).

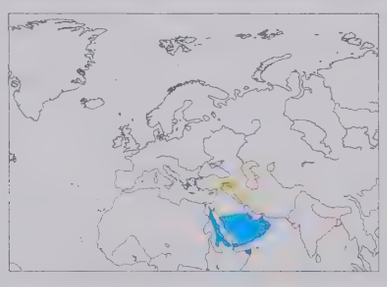
323. Chestnut-rumped Wheatear

Oenanthe xanthoprymna

French: Traquet kurde **German**: Rostbürzel-Steinschmätzer **Spanish**: Collalba Persa
Other common names: Red-tailed/Rufous-tailed/Red-rumped/Persian Wheatear

Taxonomy. *Saxicola xanthoprymna* Hemprich and Ehrenberg, 1833, Nubia, north Africa.
Usually treated as conspecific with *O. chrysopygia*, but the two differ considerably in plumage; they are claimed to intergrade in NW Iran, with intermediates reported, having been named as race *cummingi*; however, latter form may actually represent first-year plumage of present species, and no proof of intergradation has been put forward; further study required. Monotypic.

Distribution. SE Turkey to SW Iran, probably also extreme NE Iraq; non-breeding E Egypt S to E Sudan and Eritrea, Arabian Peninsula and NE Somalia.



Descriptive notes. 14–15 cm. Breeding male recalls that of *O. moesta*, but crown to back and scapulars more uniform brownish-grey, shorter and narrow white supercilium, no white in wings, rump pale chestnut, tail white with black central feathers and terminal band. Non-breeding male has paler back, buff-edged wings, hoary black face. Breeding female is like breeding male, but duller on throat and often chestnut in place of white in tail, sometimes with pale throat; non-breeding female is duskier and duller. Juvenile apparently undescribed; first-year male resembles adult, but has rusty-tinged tail sides; first-year female resembles non-breeding female but paler, with rusty-tinged ear-coverts, rusty-buff tail sides. VOICE. Song and calls apparently not specifically described, as species usually treated as conspecific with *O. chrysopygia*; vocalizations probably fairly similar to latter's.

Habitat. Breeds on dry rocky mountain slopes and in valley bottoms where patches of dwarf shrubs and herbs (e.g. *Ferula*) are interspersed with bare rocks, scattered boulders or stunted trees; 1500–2100 m in Turkey, 1000–4100 m in Iran. In winter in Africa, in coastal plain and rocky hills, mostly in arid habitats such as cliffs, gorges, acacia grassland, annual grassland, rocky desert; preference for rocky, hilly ground may segregate it from plains-dwelling *O. isabellina* and *O. deserti*. In UAE in winter, occupies broken hillsides, wadis and acacia plains, often in same habitat as resident *O. albonigra*.

Food and Feeding. Ants, beetles, termites, caterpillars and many other insect species, also occasionally small lizards, seeds and fruit. On flatter ground forages mainly by terrestrial bound-and-grab manoeuvres; in more broken ground other techniques may predominate, flying to ground from perch to take prey, sallying after flying insects, and sally-gleaning. Seems to hunt more from perch than does *O. chrysopygia*, using flimsier vegetation, and more frequently flycatches.

Breeding. Nests with young early to mid-Jun and early Aug in E Turkey; fledglings from mid-Jun in SW Iran. Nest apparently unreported; presumably similar in type and placement to that of *O. chrysopygia*. No other information.

Movements. Migratory. Autumn passage occurs on broad front, Sept–Oct, probably in SSW direction; largely bypasses Israel, where recorded a few times Sept and Nov–Dec (one wintering record, Nov–Mar), or possibly crosses (and perhaps winters in) far E of country. Present in African winter quarters mid-Oct to Mar; in UAE, fairly common Oct to mid-Mar.

Status and Conservation. Not globally threatened. Conservation status requires reassessment following new taxonomic arrangement, which restricts species to much smaller range. Turkish population in c. 2000 judged to be 2100–7000 pairs and in decline, and this represents substantial proportion of global total; species may thus qualify as Near-threatened. Scarce but locally common winter visitor in Egypt.

Bibliography. Anon. (2004e), Bates (1935, 1936), Beaman & Madge (1998), Cramp (1988), Étchécopar & Hüe (1964), Goodman *et al.* (1989), Hagemeijer & Blair (1997), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Kasparek (1986, 1992), Keith *et al.* (1992), Kumerloeve *et al.* (1984), Loskot & Vietinghoff-Scheel (1978), Nikolaus (1987), Panov (1999), Paz (1987), Porter *et al.* (1996), Richardson (1990), Sclater & Mackworth-Praed (1918), Shirihai (1996), Short & Horne (1981), Sinclair & Ryan (2003), Vaurie (1949), Walker (1981).

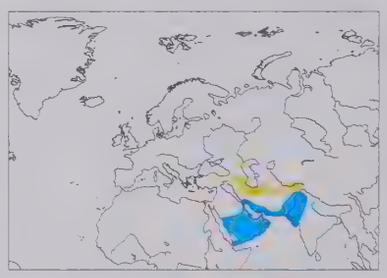
324. Rusty-tailed Wheatear

Oenanthe chrysopygia

French: Traquet à queue rousse **German**: Kaukasussteinschmätzer **Spanish**: Collalba Afgana
Other common names: Red-tailed/Rufous-tailed/Rufous-rumped/Afghan Wheatear

Taxonomy. *Dromolaea chrysopygia* de Filippi, 1863, Demavend, north-central Iran.
Usually treated as conspecific with *O. xanthoprymna*, but the two differ considerably in plumage; they are claimed to intergrade in NW Iran, with intermediates reported, having been named as race *cummingi*; however, latter form may actually represent first-year plumage of present species, and no proof of intergradation has been put forward; further study required. Birds breeding from Afghanistan to Pamirs have been separated as race *kingi*, on grounds of slightly paler plumage, but differences very minor, not warranting recognition. Monotypic.

Distribution. NE Turkey, Armenia and N Iran E to S Tadjikistan (Pamir range), Afghanistan and extreme W Pakistan; non-breeding Arabian Peninsula, S Iraq, S Iran, E Afghanistan, Pakistan and NW India.



Descriptive notes. 14·5 cm; 18–29 g. Plumage is greyish-brown from crown to back, with blackish lores to eye, buff preocular supercilium and mid-grey postocular supercilium extending around (rust-tinged) ear-coverts onto chin and breast, and shading to pale brownish on flanks and pale orange-tinged buff on vent; wings mid-brown with broad grey-buff fringes, rump and tail pale rusty, tail with blackish central feathers and terminal band with pale rusty tips; bill and legs black. Sexes similar, female duller. Juvenile is like female but paler. VOICE. Song, by male, a series of short simple phrases separated by short pauses (sometimes pauses reduced so that sound continuous), sweet, full, slow and serene, recalling *Erithacus rubecula*, e.g. "weewee wee wee-urrr" or "wee-urr weee-ee", also "wee-chu chree" and "watchew-era"; use of mimicry questioned. Female also sings in antagonistic situations when breeding, and in courtship. Subsong a subdued lark-like warbling interspersed with scratchy buzzing sounds, but can be louder and more melodious. Winter song in Kuwait continuous, not in phrases, mostly of whistles and trills and including distinctive "pip-pip-pip, pip-pip-pip, priiiiu", each series of "pip" rising, the "priiiiu" initially rising and then downslurred; subsong occasionally given in winter. Calls include loud low grating "chek-chek" in agitation, sometimes becoming a snoring rattle, and a whistled "zvee", the two often combined as "zvee tuk"; also characteristic "thrrr thrrr thrrr", less harsh than in congeners.

Habitat. Breeds on gently angled to steep arid rocky and stony slopes and screes with scattered boulders, stony mountain ridges and ravines, and dry fallow fields in remote valleys, sometimes level boulderfields (and flatter areas within territories favoured for foraging), commonly near small or large perennial streams; dominant vegetation sparse dwarf montane shrubs, e.g. in Armenia *Paliurus spina-christi*, *Prunus dulcis* and *Atraphaxis spinosa*, with spring flush of herbs; 2500–4000 m in SW Iran, 2000–2700 m in Afghanistan, 1200–3100 m in Tadjikistan, above 2100 m in Pakistan. Stays within small territory, perching on cliff face, large rock or low in vegetation. On passage and in winter, Bahrain and Oman, found in rocky hilly country; in Iran from sea-level to 2100 m in warm steppe zones and degraded sub-steppe, and in Pakistan in sand-dune areas, clay flats, scrub desert, low stony hills and rocky ravines.

Food and Feeding. Mainly invertebrates, chiefly ants and beetles; some plant matter. Animal food includes adult and larval beetles of at least eleven families, adult and larval lepidopterans of at least seven families, many types of hymenopterans (sawflies, ichneumons, ants, social and solitary wasps, bees), bugs of at least eight families, grasshoppers, locusts, bush-crickets, termites, ant-lion larvae, caddis flies, adult and larval flies of at least three families, spiders, mites, myriapods, woodlice, sandhoppers; one record of small lizard. Plant food includes seeds or fruits of caltrops (Zygophyllaceae), madders (Rubiaceae), figworts (Scrophulariaceae), docks (Polygonaceae), daphnes (Thymeleaceae), mulberry (*Morus*), leaves and stems of grasses. Stomachs of 55 breeding birds from S Tadjikistan, May–Jul, contained 1338 items comprising, by number, 48% ants, 24% beetles, 9% bugs, 8% other hymenopterans, 5% lepidopterans, 2% spiders, 2% seeds and 2% others. Stomachs of 22 birds Jun–Aug and Oct–Mar from SW Iran contained 901 items, comprising 66% ants, 15% beetles, 9% seeds (Dec–Jan only), 10% various others or unidentified, with 94% of all items less than 1 cm long. In S Tadjikistan, food provided to nestlings 3–9 days old was, by number, 32% noctuid moth caterpillars, 20% beetles, 15% ants, 8% grasshoppers, 7% bugs, 6% termites, 6% spiders, 3% flies and 3% others. Forages either from rock perch with perch-and-pounce method, or on ground with bound-and-grab method; very adept at running over slabs of rock and boulders to take terrestrial prey; also picks items off vegetation, digs in earth with bill, sallies after flying insects (notably when ants, termites and chafers swarming, or else low over water on dull days when other insects slow); hovers low over grassland to drop onto prey. In Iran in winter, 65% of foraging movements were terrestrial dashes, 30% short flights and 5% long flights.

Breeding. Apr-Jul in Caucasus and Iran, mostly from mid-May farther E; fledged young common and nest-building mid-Jun in S Tadjikistan; Apr–Jun/Jul in Afghanistan and Pakistan; double-

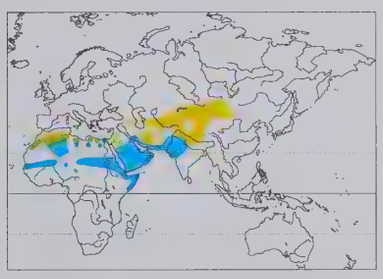
brooded. Territory 0·5–3 ha, usually 1·2–1·8 ha, but territories overlap by up to 100 m. Nest a grassy, rather deep cup, lined with fine rootlets and grass, with collection of small stones at entrance, placed in rock hollow inside cave, in wind-fretted hole in cliffs or in old bee-eater (*Merops*) burrow, distance from entrance hole to nest 20–50 cm (average at ten nests 34 cm); entrance and tunnel floor sometimes consist of several layers or heaps of small stones brought in by female; one site contained 453 stones each weighing 3–4 g, thus likely that cavity used in successive years. Eggs 3–6, white or with slight bluish tinge and with tiny reddish speckles; incubation period 13 days; no information on nestling period.
Movements. Mainly migratory. Altitudinal and short-distance migrant in Afghanistan. Present N Iran until early Nov. Scarce but probably regular winter visitor in Bahrain, Oct to early Mar, with small passage late Aug to Oct and Feb to mid-Apr; present Oman on passage and in winter late Aug to Apr. Winter visitor NW India Sept–Apr. First return in Transcaucasia from mid-Mar, from end Mar farther E. Recorded in Israel.
Status and Conservation. Not globally threatened. Generally fairly rare in many parts of range. Uncommon in Armenia, where listed as threatened owing to narrow range and unknown numbers. Scarce to locally common in Afghanistan and Pakistan. Breeding density varies with quality of habitat; 10–20 pairs/km² on rocky hillsides and screes, but up to 40 (20–70) pairs/km² on terraces and side gorges of large river in S Tadjikistan. Widespread and locally common in winter in Oman.
Bibliography. Adamian & Klem (1997, 1999), Ali & Ripley (1987b), Bates (1935, 1936), Cornwallis (1975), Cramp (1988), Dementiev *et al.* (1968), Flint *et al.* (1984), Gallagher & Woodcock (1980), Grimmett *et al.* (1998), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Keith *et al.* (1992), Loskot & Vietinghoff-Scheel (1978), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Panov (1999), Porter *et al.* (1996), Rasmussen & Anderton (2005), Roberts (1992), Shirihai (1996), Smith (1960), Vaurie (1949).

325. Desert Wheatear

Oenanthe deserti

French: Traquet du désert **German**: Wüstensteinschmätzer **Spanish**: Collalba Desértica

Taxonomy. *Saxicola deserti* Temminck, 1825, Egypt.
Several races in C of range sometimes discriminated (*salina* and *atrogularis*) but distinctions very slight, and better treated as synonyms of nominate. Boundaries of races not well established; details listed below provisional. Three subspecies recognized.
Subspecies and Distribution.
O. d. homochroa (Tristram, 1859) – N Africa (including once Mauritania) E to NW Egypt; non-breeding Sahara and N Sahel (Mauritania E to Chad).
O. d. deserti (Temminck, 1825) – NE Egypt and Levant E, discontinuously, to Azerbaijan (probably Armenia), S Kazakhstan, Afghanistan and Mongolia; non-breeding NE Africa (including Socotra I) and SW Asia.
O. d. oreophila (Oberholser, 1900) – Kashmir E to Nepal, Pamir, Tibetan Plateau and W China (S Xinjiang); non-breeding Arabia, SW Asia and NW & C India.



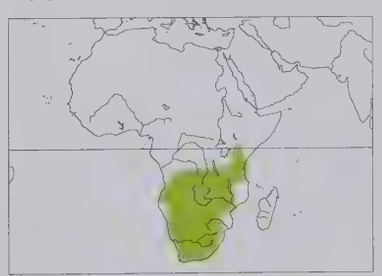
Descriptive notes. 14–15 cm; 15–34 g. Male nominate race breeding is sandy-brown from crown to upper back, with white supercilium and scapulars, black face (through eye) to throat and neck side joining black of wings; white to buffish-white lower back, rump and very bases of outer tail, rest of tail black; underparts creamy-white with buff tinges on breast and flanks, undersides of flight-feathers whitish, underwing-coverts black; bill and legs black. Non-breeding male has hoary face and obscured scapulars. Breeding female resembles first-winter *O. oenanthe*, but rather colder-toned, with pale scapulars, tail pattern as male; non-breeding female similar but duller and plainer. Juvenile is like non-breeding female, but buff-spotted above, finely scaled brownish on breast; first-winter male like breeding female, but with traces of blackish on ear-coverts and neck side. Race *homochroa* is pinkish-cinnamon, rather than sandy-brown; *oreophila* is larger, with much white on inner webs of flight-feathers. Voice. Song, by male (in flight and on ground), a distinctive series of short variable phrases each of 2–4 mournful, descending whistles, e.g. "síí-duul-a-drrol" or "déé djrruu", often punctuated by grating churr or phrases ending with soft dry rapid trill, slow tittering trill or broken quavering whistles; contrary to some published statements, no mimicry. In confrontations and courtship, phrases may become longer and quieter, incorporating the above but with various whistles, chacks and churrs. Female also sings occasionally, with more uniform phrases; songs also given in winter (also as subsong at end of breeding season and start of year). Calls include whistled "swiii" for contact-alarm and hard "tuk" or "tsack" in agitation, which combine as "swii-tuk-tuk" in higher alarm near nest; also muffled rolling "chrr".
Habitat. Dry steppes and desert edge with little vegetation, dry sparsely bushed riverbeds, wadis, ruins and stony and gravel flatlands, in NW Africa reaching 1500 m but in Indian Subcontinent between 3000 and 5100 m. In Africa breeds in sandy, stony and bushy semi-desert plains with Chenopodiaceae or *Euphorbia*, high plateaux with halfa grass and *Artemisia*, saltflats, dry wadis, tamarisk groves, arid cultivated and fallow land, railway and roadside banks with telephone wires, and gently sloping areas, but avoiding hilly terrain; in sandy areas requires either hard substrate for burrow-nesting or bushes or rocks for nesting in shelter. In Israel breeds in stony and sandy flat desert, semi-desert zones with sparse bushy or scrubby vegetation, and hillsides, valleys and wide dry riverbeds; in Jordan in silt dune areas, patches of *Juncus* at edges of dried-up marsh, and wadis, and in past bred on *Nitraria* islands in flooded Azraq marshes. Open, flat or gently undulating plains of silt or gravel with sparse herb layer and scattered bushes (mainly *Zygophyllum atriplicoides*) favoured in Iran. In Afghanistan and Himalayas occupies high valleys and bleak plateaux with rocks and furze, and in Mongolia typical of sandstone rock areas in desert, also in *Lasiagrostis* zone, particularly with cliffs. Wintering migrants in Africa occupy similar habitat to breeders there, but also sandier areas; those in UAE inhabit semi-desert, *sabkha* (saltflat) scrub and coastal dunes. In Thar Desert, in India (Rajasthan), winters in dry sandy semi-desert and desert plains with low herb layer and shrubs and very scattered bushes, and bare ground over 50–75% of substrate; shrubs identified in habitat included *Capparis decidua* as dominant, with *Crotalaria burhia*, *Aerva persica*, *A. pseudotomentosa* and *Cassia italica*; biotope shared with *Saxicola macrorhynchus*. Defends individual winter territories, in Iran 0·3–0·8 ha.
Food and Feeding. Chiefly invertebrates; also occasionally seeds. Animal food includes adult and larval beetles of at least five families, adult and larval lepidopterans, adult and larval flies, ants and bees, grasshoppers and locusts, cockroaches and mantises, bugs, earwigs, termites, dragonflies, spiders, woodlice, myriapods and worms; small lizard seen taken to nest, but vertebrate food not otherwise reported. Plant food includes occasional small seeds. Stomachs of 23 birds from SW Iran, Jan–May and Nov–Dec, held 37% by number ants, 19% insect larvae, 12% hymenopterans, 11% beetles, 9% termites, 4% bugs, 2% grasshoppers and 6% others; 95% of items less than 1 cm long. Stomachs of 38 birds from Turkmenistan, Apr, held 71% by number ants, 13% beetles, 10% caterpillars, 2% myriapods, 2% bugs, 2% others. Nestling diet includes adult and larval insects; in Mongolia mostly dipterans, coleopteran larvae and hymenopterans. Feeds on ground with bound-and-grab manoeuvres; also scans from perch (light enough to use flexible stem), often in winter a piece of stubble, and sallies either to ground or after flying insects; occasionally uses hovering as hunting technique when low wind available. Once seen to kleptoparasitize ants, removing small moths and larvae being carried by the insects, but did not eat the ants themselves.
Breeding. Feb–Jun in Morocco and mid-Mar to end May in Algeria and Tunisia; May–Jul in Egypt; early Apr to mid-Jul in Israel; from May in Pakistan and Pamirs; Apr–Jun in C Asia; late Apr to mid-Aug in Mongolia, from mid-May in Dzungarian Gobi; often two broods, but normally only one in highest areas and in NE. Territories relatively large, c. 4 ha, with at least 100 m between nests, and usually not contiguous. Nest rather bulky, made of grass and root fibres, lined with finer grass, wool, hair or feathers, placed in hole in roadside or riverbank, rock face, wall, bridge or other building, under stone, bush or pile of stones, amid exposed roots or down old rodent burrow. Eggs 3–6, faint to deeper blue or greenish-blue with rusty and violet spotting; incubation period 13–14 days; nestling period 15–18 days; post-fledging dependence up to 3 weeks. Breeding success of nine pairs in Mongolia 89%.
Movements. N African populations (race *homochroa*) partially migratory, moving S for Sept–Apr to winter in other parts of breeding range, otherwise S into N Sahara or across it into N sahelian zone in Mauritania and Mali; largely resident in SW Morocco, also in Libya and Egypt, but passage noted in Libya early Sept to late Oct and late Feb to early Apr; frequent local movements within wintering range in response to fires and agriculture. Nominate race partially migratory in Levant. Populations of nominate from S Caucasus and Iran E to Mongolia migrate S & W, leaving N areas Aug and passing through S Kazakhstan late Sept and Afghanistan late Sept to mid-Oct; most leave SW Iran early Oct, and move much farther to winter in NE Africa (joining apparently resident birds in Egypt, mid-Aug to early May, but present in Sudan only early Nov to late Feb) and from Arabia E to W India (arriving Gujarat Sept, although many other areas in India not occupied until Nov). Passage migrants (some wintering) in Israel mainly mid-Oct to Nov and Mar–Apr; winter dates in E Saudi Arabia Sept–Mar, mainly from Oct, and with minor resurgence of spring migrants late Apr and early May; UAE Oct–Mar, with light passage Sept and Apr; in Bahrain passage extended and unobtrusive, late Aug to Nov, and Jan to late Apr. On return migration, first arrivals from Arabia reach SW Iran as early as mid-Jan, and some Indian areas vacated by mid-Feb, but spring departure from Gujarat Mar–Apr, and African wintering grounds not fully vacated until late Mar; first arrivals in Turkmenistan, often involving major wave of birds, mid-Mar, and Aral Sea reached mid-Apr. Race *oreophila* winters in two disjunct areas, one along coastal Arabia from Socotra (occasionally Somalia) E to W Pakistan, and the other SE of Himalayas in NE India; concentration of passage migrants in S Arabia and regular wintering on Socotra suggest flights over NE Indian Ocean. Dates of movements poorly documented, but first returns to Pamir range, in Russia, early Apr and main passage there early May. Vagrants regularly recorded in NW Europe.
Status and Conservation. Not globally threatened. Common throughout most of range. Generally common to abundant breeder in N Africa. Fairly common in Israel, with total population estimated at 1000–2000 pairs; widespread in Jordan. Has bred in S Turkey. Widespread in Mongolia and fairly common in China. Densities usually rather low; highest reported apparently in Israel, with up to 27 pairs in 6 km², i.e. 4·5 pairs/km², while in Morocco 0·25–3·5 individuals/km², and similar low values apparent in other regions. Common in much of non-breeding range; in S Mauritania, 220,000 estimated to winter in 67,000 km².
Bibliography. Ali (1996), Ali & Ripley (1987b), Alström & Schekkerman (1988), Andrews (1995), Anon. (2004e), Ash (1980, 1981), Backhurst (1985), Barlow *et al.* (1997), Baumgart *et al.* (1995), Beaman & Madge (1998), Borrow & Demey (2001), Browne (1982), Bundy (1976), Bundy *et al.* (1989), Cave & MacDonald (1955), Cheng Tsohsin (1987), Cornwallis (1975), Cramp (1988), Dementiev *et al.* (1968), Dharmakumarsinhji (1955), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Gaston (1970), Glutz von Blotzheim & Bauer (1988), Goodman, Meininger, Baha el Din *et al.* (1989), Goodman, Meininger & Mullié (1986), Grimmett *et al.* (1998), Guichard (1955), Hagemeijer & Blair (1997), Hirschfeld (1995), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Isenmann & Moali (2000), Jennings (1995), Kasparek (1992), Keith *et al.* (1992), Kneis & Spretke (1985), Ledant *et al.* (1981), MacKinnon & Phillipps (2000), Martens & Eck (1995), Mauersberger (1980), Meyer de Schauensee (1984), Morel & Morel (1990), Newby *et al.* (1987), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Panov (1999), Paz (1987), Peter (1994), Piechocki *et al.* (1982), Portenko & Vietinghoff-Scheel (1971a), Porter *et al.* (1996), Rasmussen & Anderton (2005), Rehsteiner (2005), Richardson (1990), Ripley (1963), Roberts (1992), Roselaar (1995), Shirihai (1996), Sinclair & Ryan (2003), Smith (1971), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Ticehurst (1922), Valverde (1957), Vaurie (1949, 1972).

326. Capped Wheatear

Oenanthe pileata

French: Traquet du Cap **German**: Erdsteinschmätzer **Spanish**: Collalba Capirotada

Taxonomy. (*Motacilla*) *pileata* J. F. Gmelin, 1789, Cape of Good Hope, South Africa.
Three subspecies recognized.
Subspecies and Distribution.
O. p. livingstonii (Tristram, 1868) – C Kenya S to Botswana and E South Africa (S to N Eastern Cape).
O. p. neseri Macdonald, 1952 – Angola and N Namibia.
O. p. pileata (J. F. Gmelin, 1789) – S Namibia and W South Africa.



Descriptive notes. 16–17 cm; 24–32 g. Nominate race is black on crown and face down neck side to breast, with white lower forehead and supercilium, white chin and throat; dark brown nape to mid-rump and wings; tail black, with white outer bases contiguous with white lower rump; whitish from belly downwards, buffy flanks and vent; bill and legs black. Sexes similar. Juvenile lacks black of upper body, and has dark brown crown and blackish-brown face, buffy supercilium, buffy-white throat shading to dark-flecked buffy-brown breast. Race *livingstonii* is smaller than nominate, darker above, with narrower white above bill; *neseri* is same size as previous, intermediate in colour above between that and nominate, white on

forehead as in nominate. Voice. Song (often at night) a series of brief variable phrases, mainly 1–2 (up to 7) seconds long with pauses of 5–30 seconds, each phrase consisting of jumble of trills, whistles, churrs and clicks, with mimicry of various bird species and other animal sounds (dog bark, goat bleat, etc.). Calls include thin whistled "wiit", longer louder "suuiit" and various clicks, all given in nervous alarm.

Habitat. Dry grassy plains, especially recently burnt or heavily grazed areas, often with scattered bushes and termitaria, also Karoo semi-desert scrub, airfields, dry pans, ploughed and harvested fields, wheatfields and pastures; *Brachystegia* savanna in Angola and, rarely, highland grassland in Malawi. Moves into E Africa to breed (only above 1400 m) when grassland dying back and being burnt, leaving when rains promote new growth.

Food and Feeding. Arthropods, especially ants, flies, locusts, beetles, bugs, bees, wasps, termites, arachnids, lucerne butterflies, and caterpillars; in the Serengeti exclusively insects, specializing on ants. Stomachs of eight birds from throughout year in South Africa (Free State) held, by number, 53% worker ants, 16% beetles, 11% seeds, 10% (mostly winged) termites, 4% orthopterans, 4% myriapods and 2% caterpillars. Forages on ground, using rapid bound-and-grab manoeuvres; also scans from low perch, flying down to take terrestrial prey.

Breeding. Pattern complex in E Africa, thus Apr in W Kenya, Apr–Jul, Sept and Dec–Jan in S Kenya and E Tanzania, and Apr–May and Aug–Sept elsewhere in Tanzania; Jul–Nov in DRCongo and Aug–Oct in Malawi; Jun–Oct (peak Aug–Sept) in Zambia and Jun–Jan (peak Aug) in Zimbabwe; Feb and Jul in Namibia; in Botswana, Jun–Oct in N, Mar in SE and Nov–Jan in SW; in South Africa, Aug–Sept in N and Aug–Mar (peak Oct–Nov) in W; juveniles Aug and Dec and breeding condition Aug in Angola; may be double-brooded. Nest a cup of dry grass, leaves and rootlets, well lined with finer material including hair and feathers, placed up to 1 m down old rodent burrow in bank or flat ground, sometimes in termite mound, under railway sleeper or in eaves of building. Eggs 2–5 (usually 3), rarely up to 6, pale greenish-white or bluish-white, plain or with faint yellowish-pink speckles. No other information.

Movements. Complex and poorly understood. Dry-season breeding visitor to lowland Kenya and Tanzania (sedentary in highlands), where adults present mainly Apr–Sept, immatures until Jan; also to area from SE DRCongo S to N South Africa, adults present mainly late Apr to early Nov, immatures remaining until Feb (except SE DRCongo, where leave in Nov) and possibly all year. In Malawi, Zimbabwe and S Mozambique present May–Nov, immatures sometimes remaining until Jan. Studies of data in S Africa suggest strong post-breeding movement into drier Karoo and Kalahari regions, especially from Zimbabwe, N Botswana and N South Africa, which are almost completely vacated (although immatures may remain until Jan), whereas part of population of nominate in S Namibia S to Cape resident. Patterns less clear for race *neseri* of N Namibia, although evidence of passage in Nov–Jan and May–Jun. Some evidence that occupation of Kalahari region is variable, depending on rainfall.

Status and Conservation. Not globally threatened. Common to abundant in Kenyan and Tanzanian highlands. Common in lowland E Africa, with a mean of 76 birds/km² in Serengeti; also present in Mara Game Reserve, in Kenya. Frequent to locally common in Malawi, Zambia, SE DRCongo, Zimbabwe, C Mozambique and N South Africa highlands. Frequent to common elsewhere in South Africa and in S Namibia, sparse to locally common in N Namibia and Angola, but locally abundant SW & NE Angola. Atlas data for S of range indicate breeding in four relatively mesic areas: W coast from S Namibia S to Cape (nominate race); E Botswana and adjacent S part of N South Africa; N Botswana, Caprivi Strip and much of Zimbabwe; and C & N Namibia.

Bibliography. Beesley, J.H. (1956), Beesley, J.S.S. & Irving (1976), Benson (1940, 1971a, 1982), Benson & Benson (1977), Britton (1980), Brown & Britton (1980), Chapin (1953), Clancey (1980), Dean (2000), Folse (1982), Harrison *et al.* (1997), Hockey *et al.* (1989), Irwin (1971a, 1981), James (1947), Keith *et al.* (1992), Koen (1988), Kopij (2003), Lewis & Pomeroy (1989), Lippens & Wille (1976), Lowden Stoole (1968), MacDonald (1952), Maclean (1993), Penry (1994), Sinclair (1978, 1984), Sinclair & Ryan (2003) Swynnerton (1908), Tarboton (2001), Tarboton *et al.* (1987), Traylor (1962, 1965), Vincent (1947), White (1961b), Zimmerman *et al.* (1996).

327. Isabelline Wheatear

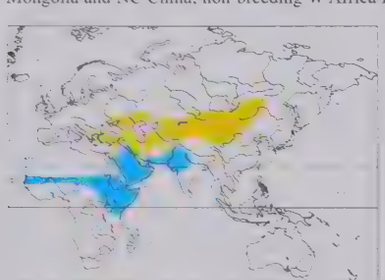
Oenanthe isabellina

French: Traquet isabelle **German**: Isabellsteinschmätzer **Spanish**: Collalba Isabel
Other common names: Isabelline Chat

Taxonomy. *Saxicola isabellina* Temminck, 1829, Nubia, north Africa.

May form a superspecies with *O. bottae* and *O. heuglini*, and all sometimes considered conspecific. Monotypic.

Distribution. NE Greece, E Balkans, Middle East and S & E Ukraine E to Transbaikalia, Inner Mongolia and NC China; non-breeding W Africa E to S Asia.



Descriptive notes. 16–17 cm; 21–39 g. Resembles non-breeding *O. oenanthe*, but slightly larger and paler, larger bill, longer legs (giving more upright stance), comparatively long and pointed wings (looking broader in flight), and relatively short tail. Male is yellowish-grey (isabelline) from crown to back and wings (black alula), with strong preocular white supercilium becoming weak and whitish-buff behind eye, blackish loral line, white face and throat with buff-tinged ear-coverts, neck side and breast, white underparts; white rump and tail, latter with black central feathers and broad black terminal band; bill and legs black. Female and first-winter very like male, but loral line paler, upperparts paler, buff and whitish edgings of wing feathers broader. Juvenile is like dull female, with buffier supercilium, faint spotting above and freckling below. Voice. Song very distinctive, mainly by male (occasionally by female), in flight and on ground in both breeding and winter quarters (often softer in winter), a loud rich melodious rambling series of variable phrases 3–7 seconds long, with pauses of 2–6 seconds, each phrase consisting of remarkable jumble of whistles, grating, twanging and "chack" notes, sometimes with excellent mimicry (of many other birds, also reputedly of e.g. shepherd's whistle, squealing puppy, donkey bray); in flight, song begins (in ascent phase) with accelerating series of downslurred "chyup" notes, and shifts (in descent phase) into rapid jumble of metallic, crackling, buzzy, twangy notes. Subdued song or subsong in winter quarters, for territorial defence, often in hottest part of day, a random sequence of very high and fairly low whistles, clucks, bleats and wails. Calls include whistled "wiiu" and harsh "chack", often in combination; disjointed whistles and "kwot-kwot" sounds in courtship display.

Habitat. Arid, open, sparsely vegetated country, including dry plains, mountain and lowland steppes, semi-desert, wadis and desert margins, commonly where burrowing rodents, e.g. gerbil *Rhombomys opimus*, occur. In Armenia, for example, found in rolling semi-desert with *Tamarix*, *Artemisia*, *Euphorbia*, *Alhagi*, *Atraphaxis* and *Gypsophila*, and in usually S-facing mountain steppe with *Astragalus*; in SW Iran strong preference for flat ground, normally undeveloped steppe, occasionally abandoned fields and margins; in Baluchistan (Pakistan) common on plateaux at 1200–2200 m, showing preference for irrigation banks and excavations, and attracted to vicinity of water; in Mongolia steppelands and areas with *Caragana* and cliffs. Throughout much of C and EC Asia inhabits open grassy plains adjacent to areas of permanent snow, to 3500 m in Tien Shan, Pamir–Alai and Altai; also in dry desert-like valleys separating mountain ridges and on lower slopes, as well as open and gravel-like deserts; in parts of C Asian plateau breeds at up to 4000 m, and on E edge of Tibetan Plateau occasionally reaches 4600 m. In C & S Kazakhstan the most numerous bird in Kara Kum and Kyzyl Kum deserts and found everywhere except in areas of moving sand; in Kara Kum occurs equally abundantly in areas of sand, gravel or clay deserts and dry slopes of the hills and low mountains; in Kyzyl Kum preferred breeding habitat is deserts of well-packed sand with scattered patches of low bushes or sand banks; elsewhere in Kazakhstan plains found in hilly areas of sand with scant vegetation, e.g. clumps of grasses and low-growing bushes (including *Arthrophytum*, *Calligonum* and *Tamarix*). In African winter quarters, arid steppe with light grass and bush cover, sandy and stony semi-desert plains and rolling hills with some herbage and/or dotted with bushes and trees, mainly in lowlands; in N parts of Somalia and Eritrea commonly on open plateaux between 2300 and 2700 m, as well as along sandy beaches and around human settlements. Visits burnt-over areas, old fields, oases and village edges. Generally in more arid areas than those preferred by *O. oenanthe* but with considerable overlap. Defends individual winter territories (2–3 ha in Senegal) against all congeners and similar-sized passerines.

Food and Feeding. Invertebrates and vegetable matter; mainly insects 2–40 mm in length, and in particular beetles and ants. Animal prey recorded includes adult and larval beetles of at least 13 families, hymenopterans (ichneumons, ants, bees and wasps), adult and larval flies of at least four families, adult and larval moths of at least three families, caddis flies, lacewings, ant-lions, bugs, termites, grasshoppers, mole-crickets, cockroaches, mantis pupae, dragonflies, mites, spiders, harvestmen, solifugids, scorpions, millipedes, woodlice and molluscs; occasionally also small vertebrates. Small seeds (e.g. of legumes and *Ceratocarpus turkestanicus*) also occasionally taken. Two major studies of diet in Palearctic yielded broadly similar results: in Turkmenistan, stomachs of 218 birds from throughout year held, by number, 38% ants and 36% termites, and 56% of stomachs held ants, 52% beetles, 28% termites, 24% caterpillars, 16% grasshoppers and 14% bugs; in SW Iran, stomachs of 37 birds from throughout year held 61% ants, and 84% of stomachs held ants, 78% beetles, 30% bugs, 30% spiders, 22% termites, 22% other hymenopterans, 11% grasshoppers and 11% woodlice (96% of items less than 10 mm). Other studies reveal same general choices and proportions, although beetles sometimes predominate in smaller samples. Nestlings provisioned with softer-bodied prey than that eaten by adults: of 404 items brought to week-old nestlings in Turkmenistan, 61% were caterpillars, 25% myriapods, 5% beetles, 5% spiders, 3% adult lepidopterans, 1% grasshoppers and a few ants; elsewhere young seen to be fed with lizard 5 cm long, also an earthworm. In winter quarters, beetles, grasshoppers and ants (including *Messor barbarus*) targeted. Forages mostly in cooler parts of day, using bound-and-grab manoeuvres, perch-and-pounce sallying, sallying after flying insects and sally-gleaning; these four techniques used in, respectively, 86%, 8%, 4% and 1% of foraging attempts in one study in Kenya, but in Senegal perch-and-pounce and aerial sallying were more important than bound-and-grab, the difference being caused by habitat structure. Also digs in ground in early spring, when few invertebrates on surface, and will then also seek food down rodent burrows.

Breeding. Mid-Apr to mid-Jul in Israel and Apr–May in Jordan; Mar–Jun in Armenia and Baluchistan; sometimes as early as mid-Feb in Turkmenistan, but normally late Mar to Jul in S Russia; late Apr to mid-Jul in Mongolia. Sometimes bigamous. Average territory size in SW Iran 2·2 ha (range 0·52–6·9 ha), in Russia 2·7 ha (1·1–6·4 ha), size increasing with age and number of mates (average for older bigamous males 3·2 ha); in Turkmenistan 0·7–4·2 ha (although figures only approximate, as many territories overlap by up to 20–50 m); in Transbaikalia all territories smaller, 1·2–2 ha. Nest a shallow, bulky cup of dried grass, roots and hair, lined with hair, wool and feathers, placed deep (0·9–3·1 m, mean c. 2 m) in rodent burrow or burrow of similar mammal, less often in old bee-eater (Meropidae) hole or occasionally natural hole or crevice. Eggs 4–7, pale blue to almost white, sometimes with reddish spots; incubation period 12 days in one account, 14–15 in another; nestling period 13–15 or 15–17 days; post-fledging dependence c. 14 days. In Turkmenistan, 82% of 29 eggs hatched, 62% of eggs laid produced fledged young; in Transbaikalia, hatching success 84·8%, with 4·4 fledglings per pair; in Volga–Ural region 43% of total eggs laid produced fledglings; in Ukraine, steppe stoat (*Mustela eversmanni*) a significant predator, and nests also lost to flooding and ant invasions; loss of nests higher if burrow occupied by rodent.

Movements. Migratory; winters in Africa (mainly Sahel zone and NE & E Africa), Arabian Peninsula and SW Asia. Autumn migration at night on broad front, W populations heading SW over E Mediterranean, passage through Tunisia late Aug to late Nov, Egypt mid-Aug to mid-Oct, Israel mainly mid-Aug to mid-Oct (some overwintering), Jordan Aug to early Oct, E Arabia Aug–Nov (mainly Sept), arriving in W Africa mainly in Oct, in Sudan, Eritrea and Somalia Sept, inland Ethiopia and Kenya Oct, Tanzania Dec; vagrant in Seychelles recorded Nov. Most of Ukrainian population considered probably to migrate down E side of Black Sea; E parts of range vacated from late Jul (some remaining in Gobi into Oct), suggesting that populations may undertake strong W movement before crossing W Himalayas to reach SW Asian wintering grounds (passage Ladakh and Kashmir Aug–Oct and Mar–Apr). Some local movements noted in winter quarters, with birds in Kenya disappearing after Oct–Nov rains but reappearing when drier; also moves in response to grass fires. Spring departure in W mainly Feb–Mar, with passage Algeria to Libya Feb–May (peak Mar), Egypt mid-Mar to mid-Apr (now rare but regular spring visitor, Morocco), mainly end Feb to early Apr in Israel and Mar to mid-Apr in Jordan; mainly late Feb through Mar in E Arabia; arrival back in SW Iran from early Feb and in Turkmenistan late Feb, S Kazakhstan mid-Mar, Mongolia end Mar to mid-Apr. Vagrants recorded in NW Europe and elsewhere.

Status and Conservation. Not globally threatened. Generally common to very common. European population in mid-1990s estimated at 423–1378 pairs, with additional 100,000–1,000,000 pairs in Russia and same in Turkey; by 2000 total European population (including European Russia and Turkey) revised to 2,100,000–6,300,000 pairs and considered generally stable. In optimal habitat (with many rodent holes) around Caspian Sea densities can reach 3–4 pairs/ha (300–400 pairs/km²), but this exceptional; in good habitat, over relatively restricted areas, up to 140–190 pairs/km², but commonly densities lower, e.g. 6·25–15 pairs/km². Fate to some extent tied to that of burrow-nesting rodents, which supply nest-holes; thus species declines commensurately with declines in e.g. gerbil numbers owing to ploughing. Nonetheless, breeding range has expanded W since 1960 in apparent response to drier summers, with colonization of Crimea, Thrace, NE Greece, Aegean islands, Bulgaria and Romania; in Ukraine range has extended N following the expansion of little souslik (*Citellus pygmaeus*). Uncommon breeding visitor and resident in Israel (c. 70 pairs), but common to very common passage migrant and fairly common winter visitor; common breeder in upland steppe areas of Jordan. Very common in Mongolia, and common in N & NW China. Common to abundant throughout almost whole of winter quarters; greater frequency of records in NW Africa in recent years may reflect expansion of breeding range. Commonest wintering wheatear in many areas of UAE.

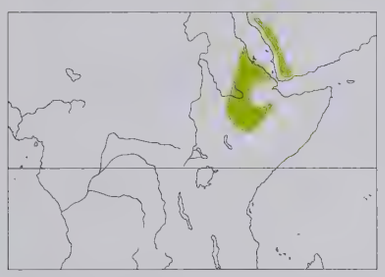
Bibliography. Adamian & Klem (1997, 1999), Ali (1996), Ali & Ripley (1987b), Andrews (1995), Anon. (2004e), Aspinwall (1977b), Barlow *et al.* (1997), Baumgart *et al.* (1995), Beaman & Madge (1998), Borrow & Demey (2001), Bradshaw (2000), Britton (1980), Browne (1982), Bundy (1976), Bundy *et al.* (1989), Cave & MacDonald (1955), Cheng Tsohsin (1987), Cornwallis (1975), Corso (1997), Cramp (1988), Dementiev *et al.* (1968), Dharmakumarsinhji (1955), Elgood *et al.* (1994), Étchécopar & Hüe (1964), Flint, P. & Stewart (1992), Flint, V.E. *et al.* (1984), Gallagher & Woodcock (1980), Gaston (1970), Gee (1984), Glutz von Blotzheim & Bauer (1988), Goodman *et al.* (1989), Grimmett *et al.* (1998), Hagemeijer & Blair (1997), Hirschfeld (1995), Hollom (1959), Hollom *et al.* (1988), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), Isenmann & Moali (2000), Ivanitzky (1981, 1982), Kasparek (1992), Keith *et al.* (1992), Kneis & Spretke (1985), Lack (1985), Ledant *et al.* (1981), Leisler *et al.* (1983), Lewis & Pomeroy (1989), MacKinnon & Phillipps (2000), Ivanitzky (1981, 1982), Kasparek (1992), Keith *et al.* (1992), Kneis & Spretke (1985), Lack (1985), Ledant *et al.* (1981), Leisler *et al.* (1983), Lewis & Pomeroy (1989), MacKinnon & Phillipps (2000), Mauersberger (1980), Meyer de Schauensee (1984), Morel & Morel (1990), Nightingale & Hill (1993), Nikolaus (1987), Paludan (1959), Panov (1999), Paz (1987), Piechocki *et al.* (1982), Pineau (1976), Portenko & Vietinghoff-Scheel (1971b), Rasmussen & Anderton (2005), Richardson (1990), Roberts (1992), Robson (2000), Roselaar (1995), Schmidl (1982), Shirihai (1996), Sinclair (1978), Sinclair & Ryan (2003), Skerrett *et al.* (2001), Smith (1971), Thévenot *et al.* (2003), Thomsen & Jacobsen (1979), Tye (1984, 1988b), Tye & Tye (1983), Vaurie (1949, 1955c, 1972), Zheng Guangmei & Zhang Cizu (2002), Zimmerman *et al.* (1996).

328. **Buff-breasted Wheatear**

Oenanthe bottae

French: Traquet à poitrine rousse **Spanish**: Collalba de Botta
German: Braunbrust-Steinschmätzer
Other common names: Botta's/Red-breasted Wheatear

Taxonomy. *Campicola bottae* Bonaparte, 1854, no locality = Yemen.
May form a superspecies with *O. isabellina* and *O. heuglini*, and all sometimes considered conspecific. Commonly treated as conspecific with latter, but geographical break between the two abrupt, and they differ in plumage and particularly in size, as well as in habitat and, reputedly, behaviour. Two subspecies recognized.
Subspecies and Distribution.
O. b. bottae (Bonaparte, 1854) – highlands of SW Saudi Arabia and Yemen.
O. b. frenata (Heuglin, 1869) – highlands of Eritrea and Ethiopia.



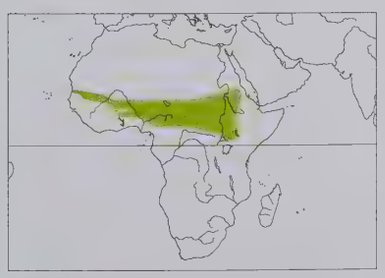
Descriptive notes. 14–16 cm. Resembles *O. isabellina*, but with slightly shorter legs, sooty-smudged greyish-brown forecrown to mid-crown shading to paler brown-grey mantle and back, white supercilium, blackish eye-mask, whitish underparts with pale orange-buff breast and flanks (colour change from throat to breast fairly abrupt, unlike in *O. heuglini*), narrower white rump; distinctive downward tail-wagging. Sexes similar. Juvenile is paler, buff-spotted above, dark-scaled below. Race *frenata* is darker above than nominate, crown and back more uniform mid-greyish, white throat contrasts sharply with rusty-buff underparts. Voice. Song, often in low flight, a series of phrases consisting of fluty and hard scratchy notes. Calls include "tjeet" in alarm.
Habitat. Nominate race found on open hillsides with sparse vegetation, cultivated terraces in high plateaux above 1600 m. Race *frenata* occupies tussock-grass, giant-heath moorlands and montane grass savanna, at 1800–4100 m.
Food and Feeding. No information on food. Typically, forages by investigating ground in methodical search.
Breeding. Feb–Jun in Ethiopia; food-carrying adults Apr–Jul in SW Arabian Peninsula. Nest placed under boulder or in earth bank, stone wall or old rodent burrow. No other information.
Movements. Apparently sedentary; possibly some post-breeding descent from highest elevations.
Status and Conservation. Not globally threatened. Nominate race often common. Race *frenata* uncommon in Eritrea and S Ethiopia, but locally common to abundant in W, C & SE highlands of Ethiopia.
Bibliography. Bates (1934, 1936), Bie & Morgan (1989), Cheesman & Sclater (1935), Cheke (1982), Cornwallis & Porter (1982), Giraudoux *et al.* (1988), Hollom *et al.* (1988), Jennings (1995), Keith *et al.* (1992), Porter *et al.* (1996), Sharland & Wilkinson (1981), Sinclair & Ryan (2003), Smith (1957), Thiollay (1985), Welch & Welch (1984), Wilkinson & Beecroft (1985).

329. **Heuglin's Wheatear**

Oenanthe heuglini

French: Traquet de Heuglin **German**: Heuglinsteinschmätzer **Spanish**: Collalba de Heuglin

Taxonomy. *Saxicola Heuglini* Finsch and Hartlaub, 1870, "Gondar"; error = Sudan.
May form a superspecies with *O. isabellina* and *O. bottae*, and all sometimes considered conspecific. Commonly treated as conspecific with latter, but geographical break between the two abrupt, and they differ in plumage and particularly in size, as well as in habitat and, reputedly, behaviour. Proposed race *campicolina* (described from Cameroon) considered unwarranted. Monotypic.
Distribution. S Mauritania and Mali E to Sudan, W Ethiopia, NE Uganda and NW Kenya.



Descriptive notes. 13–14 cm; 17–23 g. Resembles *O. bottae frenata*, but smaller, with narrower white supercilium, and buffier breast (dull fulvous) indistinctly demarcated from paler throat. Sexes similar. Juvenile is dark brown with rufous-buff spotting above, paler with brown scalloping below. Voice. Song, sometimes on moonlit nights, a series of extended variable phrases, each 30–60 seconds long, with pauses of c. 10 seconds, each phrase a jumble of whistles, churrs, chirps, trills, chuckles, chacks and mimicry; given in vertical display-flight, slowly rising to 2–6 m, with rapidly fluttering wings and spread tail, uttering no more than few snatches during descent. Calls include hard "chack".
Habitat. Dry, bare or short-grass areas in flat stony ground or on boulder-strewn hillsides, degraded savanna, inselbergs and dry fallow fields, preferring overgrazed and burnt-over areas; to 2300 m (1500 m in Uganda). Inhabits *Syzygium–Adina* riparian woodland in Central African Republic; in E Africa prefers black "cotton" soil.
Food and Feeding. Insects. Occurs in small groups outside breeding season. Rather shy.
Breeding. Dec–Apr (late dry season) in Nigeria and Cameroon and Mar in Sudan; sometimes two broods. Nest a cup of coarse dry grass lined with fine grass, sometimes with inner lining of fur, usually placed up to 1 m inside old rodent burrow, hole in termitarium or cleft in rock face; nest sometimes reused for second brood. Eggs 2–4, usually 3, pale blue to greenish-blue, plain or with small reddish flecking; incubation period 14 days; nestling period 15 days; post-fledging dependence unknown, but fledglings quick to seek to fend for themselves, in one case returned to nest-burrow to roost for several days after fledging.
Movements. Apparently sedentary in Ethiopia, but at least partial migrant elsewhere. At start of rains in Apr/May, and in response to increasing grass height, moves N to soudanian and sahelian zones to moult, returning Nov. May also undertake local movements in search of burnt ground.
Status and Conservation. Not globally threatened. Uncommon in W Eritrea and W highlands of Ethiopia; generally frequent to common across broad sub-Saharan range, although abundance varies with season. Fairly common visitor, perhaps seasonally only (mainly May–Dec), in extreme NW Kenya.
Bibliography. Bannerman (1953), Bates (1927), Borrow & Demey (2001), Britton (1980), Butler (1905, 1908), Demey *et al.* (2003), Ebbutt (1967), Elgood, Fry & Dowsett (1973), Elgood, Heigham *et al.* (1994), Keith *et al.* (1992), Lewis & Pomeroy (1989), Lynes (1924), Lynes (1925), MacGregor (1950), Newby (1980), Nikolaus (1987), Sclater & Mackworth-Praed (1918), Sinclair & Ryan (2003), Smith (1957), Zimmerman *et al.* (1996).

Tribe ENICURINI

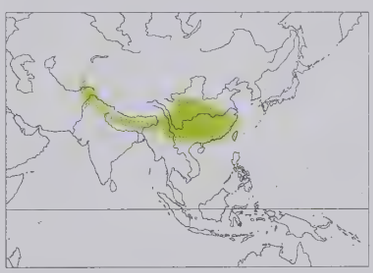
Genus *ENICURUS* Temminck, 1822

330. **Little Forktail**

Enicurus scouleri

French: Énicure nain **German**: Stummelscherenschwanz **Spanish**: Torrentero Chico

Taxonomy. *Enicurus Scouleri* Vigors, 1832, Simla, Himalayas.
Isolated population in Taiwan named as *fortis*, on average very slightly larger and with more white on forecrown, but overlap in these characters with birds from elsewhere in range considered too great to warrant recognition. Monotypic.
Distribution. Tadjikistan and W Tien Shan and Pamir–Alai E through Himalayas to NE India (Assam), C & E China, W Myanmar (possibly winter only), NW Vietnam, and Taiwan.



Descriptive notes. 12–14 cm; 11–19 g. Smallest forktail, with notched, relatively short tail. Has black head to upper breast, back, wings and central tail, with white rounded forehead, wing patch, lower back to rump (with dark grey bar), outer tail and lower breast to undertail-coverts, with grey-dappled flanks; black bill, pink legs. Sexes similar. Juvenile is as adult, but with dark forehead, white with dark scaling below. Voice. Relatively silent. Song and calls not well distinguished, two vocalizations reported: very soft, clear "tji-u tji-u tji-u tji-u..." (presumably the rather insistent twitter reported in Afghanistan); and loud thin "ts-youeee", commonly regarded as song but possibly better classified as a self-advertising call.
Habitat. Margins of montane watercourses, from small rocky streams less than 3 m wide to the most rugged rivers 30–40 m across. Seems to prefer small to medium-sized streams (and thus often small tributaries of large rivers), then often particularly favouring precipitous areas with little shady canyons, damp fern-clad gorges and associated dashing waterfalls, typically with at least bushy and mainly adjacent forest vegetation. In Afghanistan always apparently associated with waterfalls or the most turbulent parts of streams. Breeds at 1800–3300 m, wintering at 1000–2000 m, sometimes down to plains level (Myanmar); in Nepal, recorded at 600–1600 m in winter; in W China 1100–2500 m.
Food and Feeding. Chiefly aquatic insects and crustacea; nine stomachs from Tadjikistan contained tipulids, staphylinid beetles, buprestid beetles, ants, flies and some plant matter, while another held plant remains and grit. Insects seen taken to nestlings. Forages by picking prey, dead and alive, off wet rocks, sometimes by standing in shallow rapids and picking out passing morsels, sometimes ascending water-washed rocks against current (sometimes body almost submerged, sometimes submerging head entirely to take prey), gleaning from water and rock surface, also from adjacent leaves and grass; occasionally makes short flycatching sallies or hover-picks floating item from surface. In study in Nepal, 55% of observations of foraging position involved mid-river rocks, 29% marginal rocks and 16% other positions in river; most time (98%) spent in picking prey from wet rocks and waterfalls, 80–124 pecks per minute, taking almost exclusively tiny aquatic larval or nymphal stages of insects such as mayfly nymphs, caddis larvae and blackfly (*Simulum*) larvae. Pair studied in Pakistan foraged for brief periods in early morning, at midday and in evening; much of rest of time spent in loafing in shelter, sometimes on low perch in bush.
Breeding. Apr in Afghanistan and Apr–Jul in Pakistan and India; from Mar for several months in S China; two broods, at least in S China. Territory 200–500 m of stream. Nest a compact cup made of living moss and moss roots, leaf fibre, leaves and grass, lined with leaf skeletons, rootlets and leaf parts, placed in hole in fern-clad rock or mossy bank or on tiny high ledge, often behind waterfall. Eggs 2–4 (3–5 in S China, mainly 3 in Pakistan), white to pale greenish or pale pinkish with sparse pale reddish-brown to yellowish-brown speckles. No other information.
Movements. Vertical movements and some short-distance migration; possibly only winter visitor in Myanmar.
Status and Conservation. Not globally threatened. Uncommon in Tien Shan and Pamir–Alai Mts. Locally frequent but generally fairly uncommon in Pakistan, where on two streams in one area of

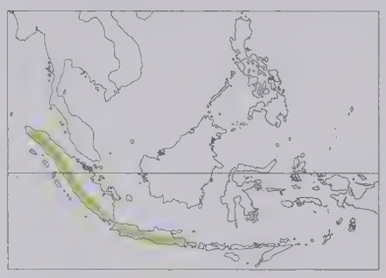
Gilgit a pair noted every 500–600 m. Fairly common in Nepal. Fairly common but nowhere abundant in S China.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Dementiev *et al.* (1968), Dodsworth (1911), Flint *et al.* (1984), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Manel, Buckton & Ormerod (2000), Manel, Dias *et al.* (1999), Martens & Eck (1995), Mauersberger (1988), Meyer de Schauensee (1984), Ormerod *et al.* (2000), Paludan (1959), Perreau (1910), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Schäfer (1938), Smythies (1986), Tyler & Ormerod (1993), Vaurie (1955c).

331. Sunda Forktail

Enicurus velatus

French: Énicure voilé **German**: Zwergscherenschwanz **Spanish**: Torrentero de la Sonda
Other common names: Lesser Forktail

Taxonomy. *Enicurus velatus* Temminck, 1822, Java.
Two subspecies recognized.
Subspecies and Distribution.
E. v. sumatranus (Robinson & Kloss, 1923) – Sumatra.
E. v. velatus Temminck, 1822 – Java.



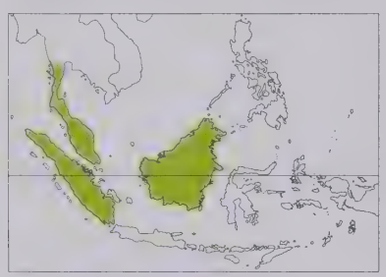
Descriptive notes. 16 cm. Tail deeply forked but evenly graduated ("stepped"), so that white tips of overlaid black feathers appear as bands or double crescents down long black tail; two outer feathers entirely white. Male nominate race has white forehead and short supercilium, grey crown to nape, dark grey rest of head, neck, back and wings; black chin and upper throat cutting away to include malar area adjacent to dark grey cheek; faint white wingbar, white rump, and breast to belly; black bill, whitish-yellow or whitish-pink legs. Female is as male, but with chocolate-brown crown and nape. Juvenile apparently undescribed. Race *sumatranus* female has slightly more rufous tinge on crown. Voice. A hard shrill "chee" or "hie-tie-tie".
Habitat. Boulder-strewn rivers, margins and fast-flowing streams in hill and mountain forest; 600–2000 m in Sumatra, 600–1800 m in Java but occasionally near sea-level.
Food and Feeding. Water insects and their larvae, snails.
Breeding. Aug in Sumatra; Jan and Apr–Jul in W Java. Nest apparently similar to that of *E. leschenaulti*. Eggs 2, whitish with reddish and purple spotting. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Restricted-range species: present in Sumatra and Peninsular Malaysia EBA and Java and Bali Forests EBA. Common in Sumatra; much rarer in Java, where less common than *E. leschenaulti*.
Bibliography. Andrew (1985), Hellebrekers & Hoogerwerf (1967), MacKinnon (1988), MacKinnon & Phillipps (1993), van Marle & Voous (1988).

332. Chestnut-naped Forktail

Enicurus ruficapillus

French: Énicure rousse-cape **German**: Rotkopf-Scherenschwanz **Spanish**: Torrentero Capirrufo
Other common names: Chestnut-backed Forktail

Taxonomy. *Enicurus ruficapillus* Temminck, 1832, Palembang, Sumatra.
Monotypic.
Distribution. S Myanmar, Malay Peninsula, Sumatra and Borneo.



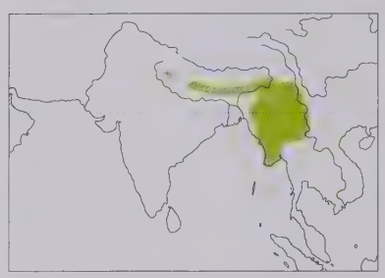
Descriptive notes. 18–20 cm; 27 g. Long, deeply forked but evenly graduated tail with white tips, two outer feathers entirely white. Male has rich chestnut crown to nape, including area from rear eye diagonally back to neck side; low white forehead enclosed by black line running back around eye and joining black throat to lower neck side; mantle and wings black, bold white wingbar; back to uppertail-coverts white, adjoining white of underside, breast with blackish scaling; bill black, legs pinkish. Female is similar to male, but with chestnut extending to mantle and back. Juvenile has head duller than adult, lower face, chin and throat whitish, breast more smudgily marked, flanks greyish. Voice. Call, in low flight, a penetrating whistle or three loud whistles with middle note higher.
Habitat. Margins of small clear shady rivers and streams in primary and logged mixed dipterocarp lowland and hill forests, occasionally in secondary scrub, on dry ridges and along logging roads. Sea-level to 1300 m; to 900 m in S Thailand.
Food and Feeding. Terrestrial invertebrates, once also a 20-cm banded snake. Six stomachs from Sumatra held insect remains, including beetles, larvae, ants, earwigs and a green caterpillar. Forages along streamsides on and among rocks, in damp streambeds, along margins of pools, and from ground near water.
Breeding. Feb in S Thailand; in Peninsular Malaysia mainly Jul–Sept, but also Dec, Feb and Apr, with young in May–Jun; juvenile mid-Mar in Sumatra; breeding-condition birds in Feb, Mar and May in Borneo. Nest a neat cup of plant fibres, hung externally with moss, lined with leaf skeletons, placed with mud fixative to vertical bank or boulder or under rock ledge, usually near stream. Eggs 2, glossy white to pale pink with reddish-brown speckles over purplish undermarkings. Nests parasitized by Brush Cuckoo (*Cacomantis variolosus*). No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Currently considered Near-threatened. Uncommon in S Myanmar, W & S Thailand and Peninsular Malaysia. Erratic and patchy in distribution in Borneo, where possibly commoner in hilly areas than true lowlands; common in N (Sabah); regular in Barito Ulu area of C Kalimantan in 1988. Uncommon in Sumatra. Forest destruction in Sundaic lowlands has been so severe that all primary formations predicted to have disappeared by 2010. This species must have declined substantially as a result, but maintains populations on slopes which are less at risk.
Bibliography. Chasen & Hoogerwerf (1941), Davison (1995), Duckworth *et al.* (1996), Glenister (1971), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (1993), van Marle & Voous (1988), Medway & Wells (1976), Robson (2000), Sheldon *et al.* (2001), Smythies (1986, 1999), Stattersfield & Capper (2000), Wilkinson, Dutson & Sheldon (1991).

333. Black-backed Forktail

Enicurus immaculatus

French: Énicure à dos noir **Spanish**: Torrentero Dorsinegro
German: Schwarzrücken-Scherenschwanz

Taxonomy. *Motacilla* (*Enicurus*) *Immaculatus* Hodgson, 1836, Nepal.
Monotypic.
Distribution. C & E Himalayas, Myanmar, NW Thailand and S China (W Yunnan).



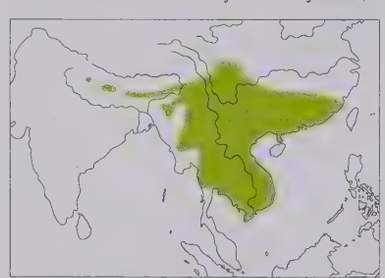
Descriptive notes. 20–25 cm; 25–29 g. Long, deeply forked but evenly graduated tail with white tips, outer feathers entirely white. Has black head and throat, white mask (forehead to eyes), black back and wings, broad white wing patch and small flash at base of primaries; white underside; bill black, legs pinkish. Sexes similar. Juvenile is brownish-black above, no white mask, shorter tail, dark scaling on breast. Voice. Short song delivered from rock. Calls include squeaky-hinge "weeng" (identical to that of *E. schistaceus*), hollow "huu" and shrill "zeee" (slightly higher than that of *E. schistaceus*), sometimes combined as "hurt-zeee", and a disyllabic note when flushed and sometimes from cover.
Habitat. Sides and centres of rocky hill streams and fast-flowing rivers with uncovered rock shoals, muddy margins and waterfalls in dense damp forest, including teak forest; lowlands to 1450 m in W of range, to 900 m in E.
Food and Feeding. Insects. In study in Nepal, 39% of observations of foraging position involved marginal rocks, 28% shoals or marginal ground, 22% riparian ground, 5·5% other areas of river, and 5·5% mid-river rocks; foraging techniques involving picking prey 39% from shoals or mud, 30% from rocks, 18% from riparian ground or vegetation, and rest in or on water or on riverbed, and in air.
Breeding. Mar–May in Himalayas and probably throughout range. Nest a compact, solid cup with outer covering of moss, lined with leaf skeletons, placed in hollow in bank, under rocks or amid tree roots. Eggs 3, variable in colour but mainly pinkish with reddish-brown spots and blotches. No other information.
Movements. Sedentary.
Status and Conservation. Not globally threatened. Fairly common in Nepal. Widespread and fairly common in Myanmar, but uncommon in NW Thailand.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Deignan (1945), Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Marten (1906), Martens & Eck (1995), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Tyler & Ormerod (1993).

334. Slaty-backed Forktail

Enicurus schistaceus

French: Énicure ardoisé **German**: Graurücken-Scherenschwanz **Spanish**: Torrentero Dorsigrís

Taxonomy. *Motacilla* (*Enicurus*) *schistaceus* Hodgson, 1836, Nepal.
Monotypic.
Distribution. C & E Himalayas E to Myanmar, SC & E China, Thailand and Indochina.



Descriptive notes. 22–25 cm; 26–38 g. Very like *E. immaculatus*, including in size, but with slate-grey crown to mantle. Sexes similar. Juvenile is like juvenile *E. immaculatus*, but greyer above. Voice. Call a high, thin, sharp, metallic screech, "teenk", like that of small kingfisher (Alcedinidae); short, shrill, high, thin "seet" or metallic ascending "tseet", occasionally followed by rasping "chaat", and squeaky-hinge "weeng" (identical to that of *E. immaculatus*).
Habitat. As *E. immaculatus*, preferring larger rivers in valleys, often in open country. Breeds at 300–1600 m in Himalayas, wintering down into adjacent plains; recorded at 400–1800 m in Thailand. In S China, separated ecologically from *E. leschenaulti* by its occupation of higher inland streams.
Food and Feeding. Small aquatic and water-associated invertebrates. In study in Nepal, 56% of observations of foraging position involved marginal rocks, 21% other areas of river, 9% shoals or marginal ground, 7% riparian ground and 7% mid-river rocks; prey-picking techniques were 50% from in or on water or on riverbed, 37% from shoals or mud, rest from rocks, riparian ground or vegetation, and in air.
Breeding. Feb–Jun throughout range. Nest a cup or semi-dome (depending on site) built of compacted bryophytes, grasses, leaves and leaf skeletons, lined with plant fibre and leaf skeletons, attached to rock or boulder with mud, in one instance placed in stump leaning over stream, in another on fern-covered embankment above mill-race. Eggs 2–5, pinkish-white or bluish-white to white with bold reddish-brown spots over lavender undermarkings. No other information.
Movements. Sedentary in SE Asia; subject to vertical movements in Himalayas.
Status and Conservation. Not globally threatened. Locally fairly common in Nepal. Fairly common in most of SE Asian range, but only locally so in S Thailand. Common in China.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Caldwell & Caldwell (1931), Carey *et al.* (2001), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Duckworth, Davidson & Timmins (1999), Glenister (1971),

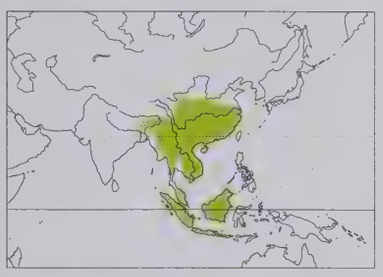
Grimmett *et al.* (1998), Inskipp & Inskipp (1991), Jeyarajasingam & Pearson (1999), Lekagul & Round (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Medway & Wells (1976), Meyer de Schauensee (1984), Rasmussen & Anderton (2005), Robson (2000), Smythies (1986), Tyler & Ormerod (1993).

335. White-crowned Forktail

Enicurus leschenaulti

French: Énicure de Leschenault **Spanish**: Torrentero Coroniblanco
German: Weißscheitel-Scherenschwanz
Other common names: Leschenault's Forktail

Taxonomy. *Turdus Leschenaulti* Vieillot, 1818, Java.
Race *borneensis* of some taxonomic interest, although morphologically not very distinct; perhaps merits a combined genetic, behavioural and morphological study. Six subspecies recognized.
Subspecies and Distribution.
E. l. indicus Hartert, 1909 – E Himalayas E to Myanmar, S China (Yunnan), W, N & E Thailand and Indochina.
E. l. sinensis Gould, 1866 – S & E China (E from extreme E Qinghai and W Sichuan), including Hainan I.
E. l. frontalis Blyth, 1847 – C & S Malay Peninsula, Sumatra, Nias I, and lowland Borneo.
E. l. borneensis (Sharpe, 1889) – upland Borneo.
E. l. chaseni Meyer de Schauensee, 1940 – Batu Is, off W Sumatra.
E. l. leschenaulti (Vieillot, 1818) – Java and Bali.



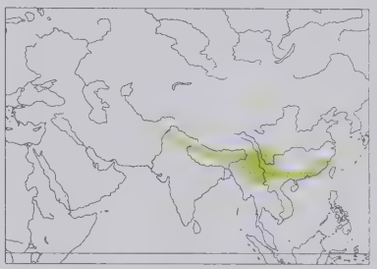
Descriptive notes. 25–28 cm; 27–38 g (up to 53 g also reported). Long, deeply forked but evenly graduated tail with white tips, outer feathers white. Nominate race has white crown, black head to breast, black back, scapulars and shoulder, white wing patch, lower back to rump and lower underparts; bill black, legs pinkish. Sexes similar. Juvenile is as adult, but with brownish head and upperparts, buffy throat and breast streaks, brown-mottled belly and brown flanks. Race *indicus* is very like nominate, but bill longer, outer rectrix 10–15 mm shorter than next; *sinensis* resembles previous, but outer rectrix 30–50 mm shorter than next; *frontalis* is smaller than nominate, with less white on crown (usually only to mid-crown); *borneensis* is like last but with longer tail, and white on inner secondaries confined to narrow straight-edged patch on tip of outer web; *chaseni* much larger and with much longer tail (131 mm) than mainland Sumatran birds (93–97 mm). Voice. Song an elaborate series of sweet high-pitched whistles, "tsswi'i'i'-lli'i'i…"; this or separate song described as a prolonged, slow, dry, hard, zingy rattling, starting with call note "gzweet", descending, decelerating to "tssee, chit-chit-chit". Calls include very sharp double screech, "hutii hutii hutii" or "tssee" or "tssee chit-chit-chit" (very similar to call of *Myophonus caeruleus*), usually in flight; single scolding notes such as dry slurred buzz, "gzuweet", higher, less abrupt and less guttural than that of *E. maculatus*.
Habitat. Fast-flowing rocky rivers, streams, brooks and rivulets through dense dark evergreen forest, even sometimes in dark ravines with virtually no water; in S China noted also as visiting cesspits and drains by villages. At 300–1200 m in Himalayas, but generally below 750 m. In C Borneo occasionally seen in dry areas of forest and by much slower-moving water and in swampy areas, even on tarmac roadsides through forest; in upland areas (race *borneensis*) occupies lower montane forest and heath and ultrabasic forest to c. 1950 m, whereas in lowlands (*frontalis*) occurs in mixed dipterocarp forest, occasionally *Albizia*.
Food and Feeding. Insects, including black beetles, water crickets, springtails and caterpillars. Forages in water, along water's edge, on rocks and damp streambeds; rarely, submerges in manner of a dipper (*Cinclus*).
Breeding. Apr–Jun in Himalayas, to Jul in S China; Apr in Myanmar; Apr and Aug in Peninsular Malaysia; Mar in Borneo, but breeding-condition birds May and Jul, fledgling with parent Feb; Oct–May in Java; two broods in S China. Nest a relatively large cup of loosely woven green moss, grasses, leaves and wood fibres, lined with leaf skeletons and leaf parts, placed on rock ledge, between boulders, among tree roots or in hollow under bush, always in damp spot and typically next to or close to running water, once behind waterfall (through which parents had to fly). Eggs 2–5 (varying with latitude, 4–5 normal S China), greyish-white to creamy-white or pale pink with small reddish-brown and lilac spots. No other information.
Movements. Sedentary in most of range, but probably some elevational shifts with season; seasonal movements in NE Indian Subcontinent, where all dated records from Bangladesh are from winter period.
Status and Conservation. Not globally threatened. Scarce in Himalayas, but relatively common in hills in S Assam (NE India). Common in China. Fairly common throughout most of SE Asian range. In Borneo, common in N (Sabah) but uncommon elsewhere; uncommon in Barito Ulu area of C Kalimantan in 1988. Generally uncommon in Sumatra, including Nias I and Batu Is. Fairly common in Java and Bali.
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336. Spotted Forktail

Enicurus maculatus

French: Énicure tacheté **German**: Fleckenscherenschwanz **Spanish**: Torrentero Moteado

Taxonomy. *Enicurus maculatus* Vigors, 1831, Simla, Himalayas.
Four subspecies recognized.
Subspecies and Distribution.
E. m. maculatus Vigors, 1831 – E Afghanistan and W & C Himalayas.
E. m. guttatus Gould, 1866 – E Himalayas, Myanmar and S China (SW Sichuan, W & C Yunnan).
E. m. bacatus Bangs & J. C. Phillips, 1914 – N Indochina and SE China (SE Yunnan E to Fujian).
E. m. robinsoni Stuart Baker, 1922 – Langbian Plateau, in SC Vietnam.



Descriptive notes. 26 cm; 34–48 g. Very like *E. leschenaulti*, but with white-spotted mantle. Nominate race has spots above shaped as half-circles. Sexes similar. Juvenile is like juvenile *E. leschenaulti*. Race *guttatus* has sparser and smaller white spots above; *bacatus* is like nominate, but white spots generally more circular; *robinsoni* has smallest spots, relatively sparse. Voice. Song described as very beautiful and best of genus, but no further information; in apparent courtship male gave soft song of subdued trills and bubbling warbles interspersed with alarm-type calls. Calls include shrill rasping "kreee", "tseeek" or more disyllabic "tsueee" or "juweet!", closely resembling that of *Myophonus caeruleus* but lower and less shrill (also like call of *E. leschenaulti*); a sharp creaky "cheek-chik-chik-chik-chik" and rapid high crackling buzzy "zhih-zhih-zhih…" when perched; repeated thin high penetrating "tjeet" in flight.
Habitat. Small sheltered streams and rivulets, preferably with strewn emergent rocks, tiny pools, tinkling waterfalls and shadowed banks, running through dense forest (habitat like ▪ narrow tunnel), wooded gorges and ravines. Breeds at 600–3000 m; winters in lowlands and foothills (down to 2300 m in Himalayas), often along somewhat wider watercourses.
Food and Feeding. Aquatic insects and their larvae, and small molluscs. Caterpillars and an adult cranefly seen brought to nestlings. Forages on ground, working steadily upstream, in and around streambed, sometimes entering water up to breast level, but usually searching gaps between stones at water's edge and entering holes under rocks. Also makes brief aerial jumps after flying insects. Rests for long periods (more than 2 hours) in cover of rock or bank. In study in Nepal, 38% of observations of foraging position involved shoals or marginal ground, 34% marginal rocks, 19% other areas of river, 6% riparian ground and 3% mid-river rocks; prey-picking techniques 60% from shoals or mud, 28% from in or on water or on riverbed, 8% from rocks, and 4% from riparian ground or vegetation. Seen to turn over stones and to foot-paddle to disturb prey; picked up large caddis-fly cases and beat them to extract larva.
Breeding. May in Afghanistan; Apr (apparent courtship Mar) to early Jul in Pakistan and elsewhere in Himalayas; Apr in Myanmar. Nest a neat but substantial cup of living wet moss and moss roots with clay intermixed, lined with leaf skeletons, placed generally in wet, water-splashed place, often directly over running water, in hole in rock or bank, but once on rock ledge by roadside cutting, once amid ferns in old retaining wall of monastery. Eggs 3–4, variably pale cream to greenish, with yellowish-brown and reddish-brown freckles. Nests often parasitized by Common Cuckoo (*Cuculus canorus*).
Movements. Mainly sedentary; some altitudinal displacements to lower areas in winter.
Status and Conservation. Not globally threatened. Locally frequent in Pakistan; common in India; fairly common in Nepal and China, increasingly so at higher altitudes where more, and more narrow, streams exist. Scarce to locally fairly common in Myanmar and N Vietnam.
Bibliography. Ali (1977), Ali & Ripley (1987b), Ali *et al.* (1996), Bates & Lowther (1952), Caldwell & Caldwell (1931), Cheng Tsohsin (1987), Delacour & Jabouille (1931), Grimmett *et al.* (1998), Hüe & Étchécopar (1970), Inskipp & Inskipp (1991), MacKinnon & Phillipps (2000), Martens & Eck (1995), Meyer de Schauensee (1984), Paludan (1959), Perreau (1910), Rasmussen & Anderton (2005), Roberts (1992), Robson (2000), Smythies (1986), Tyler & Ormerod (1993), Vaurie (1972).

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Anthony (1894). *Auk* **11**: 211-212 [*Campylorhynchus brunneicapillus bryanti*].

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Audubon (1838). *Birds Amer.* **4**: pl. 419 [*Myadestes townsendi*].

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Bangs (1902). *Auk* **19**: 352 [*Cistothorus palustris dissaeptus*].

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Bates (1937). *Bull. Brit. Orn. Club* **58**: 32 [*Oenanthe lugens boscaweni*].

Beavan (1867). *Ibis*: 322 [*Pericrocotus flammeus andamanensis*].

Bechstein (1796). *Orn. Taschenbuch Deutschland*: 206 [*Cinclus cinclus aquaticus*].

Bechstein (1798). *Allgem Ueb. Vög.* **3**: 546 [*Sialia currucoides*].

Bechstein (1802). *Orn. Taschenbuch Deutschland*: 216 [*Saxicola*].

Belding (1889). *Proc. Calif. Acad. Sci.* **Ser. 2, no. 2**: 18 [*Catharus guttatus sequoiensis*].

Benson (1950). *Ostrich* **21(2)**: 58 [*Zoothera guttata belcheri*].

Benson (1955). *Bull. Brit. Orn. Club* **75**: 104 [*Sheppardia bocagei chapini*].

Benson (1960). *Ibis* **103b**: 68-69 [*Hypsipetes parvirostris moheliensis*], 70-71 [*Coracina cinerea moheliensis*], 76 [*Turdus bewsheri moheliensis*].

Beresford (2003). *Ostrich* **74(1&2)**: 69 [*Pseudalethe*].

Beresford & Cracraft (1999). *Amer. Mus. Novit.* **3270**: 8 [*Stiphrornis erythrothorax sanghensis*].

Beresford, Fjeldså & Kiure (2004). *Auk* **121(2)**: 25-26 [*Sheppardia aurantiithorax*].

Berezowski & Bianchi (1891). *Ptitzi Kansus*: 97 [*Luscinia obscura*].

Berlepsch (1883). *Ibis*: 491 [*Thryothorus mystacalis ruficaudatus*].

Berlepsch (1884). *J. Orn.* **32**: 280 [*Thryothorus rufalbus minlosi*].

Berlepsch (1888). *Auk* **5**: 449 [*Campylorhynchus zonatus costaricensis*].

Berlepsch (1889). *J. Orn.* **37**: 293 [*Thryothorus coraya ridgwayi*].

Berlepsch (1897). *Orn. Monatsber.* **5**: 175 [*Entomodestes coracinus*], 176 [*Turdus albicollis daguae*].

Berlepsch (1902). *Orn. Monatsber.* **10**: 69 [*Catharus fuscater hellmayri*].

Berlepsch (1907). *Ornis* **14**: 347 [*Campylorhynchus albobrunneus harterti*].

Berlepsch & Hartert (1901). *Bull. Brit. Orn. Club* **12**: 12 [*Thryothorus leucotis hypoleucus*].

Berlepsch & Hartert (1902). *Nov. Zool.* **9**: 5 [*Microcerculus bambla caurensis*], 7 [*Thryothorus coraya caurensis*], 8 [*Troglodytes musculus clarus*].

Berlepsch & Leverkühn (1890). *Ornis* **6**: 6 [*Troglodytes musculus rex*].

Berlepsch & Stolzmann (1896). *Proc. Zool. Soc. London* **1896**: 326 [*Turdus albicollis spodiolaemus*], 329 [*Troglodytes musculus puna*].

Berlepsch & Stolzmann (1902). *Proc. Zool. Soc. London* **1902**: 55 [*Troglodytes solstitialis macrourus*].

Berlepsch & Taczanowski (1884). *Proc. Zool. Soc. London* **1883**: 538 [*Turdus maculirostris*], 540 [*Troglodytes musculus albicans*]; **1884**: 284 [*Henicorhina leucophrys hilaris*].

Berlioz & Roche (1970). *Monitore Zool.* **3**(Suppl.): 267-271 [*Cercomela scotocerca validior*].

Bianchi (1904). *Ann. Mus. Zool. Acad. Imp. Sci. St. Pétersb.* **9**: 128 [*Prunella collaris tibetana*].

Bingham (1900). *Ann. and Mag. Nat. Hist.* **Ser. 7, no. 5**: 358 [*Cerasophila*, *Cerasophila thompsoni*].

Blanford (1868). *Proc. Zool. Soc. London* **1867**: 833 [*Myiomela albiventris*].

Blanford (1872). *J. Asiatic Soc. Bengal* **41**: 51 [*Rhyacornis*].

Blanford (1874). *Ibis*: 79 [*Erithacus rubecula hyrcanus*].

Blasius, W. (1888). *Braunschweig. Anz.* **9**: 86 [*Thapsinillas longirostris platenae*].

Blasius, W. (1890). *J. Orn.* **38**: 143 [*Ixos everetti haynaldi*].

Blundell & Lovat (1899). *Bull. Brit. Orn. Club* **10**: 22 [*Cercomela dubia*].

Blyth (1842). *J. Asiatic Soc. Bengal* **11**: 181 [*Cinclidium*, *Cinclidium frontale*], 184 [*Pycnonotus striatus*], 187 [*Prunella himalayana*], 188 [*Zoothera mollissima*], 463 [*Coracina coerulescens*], 792 [*Pycnonotus cyaniventris*].

Blyth (1843). *J. Asiatic Soc. Bengal* **11**: 882 [*Zoothera wardii*]; **12**: 929 [*Brachypteryx montana cruralis*], 958 [*Prunella collaris nipalensis*], 959 [*Prunella strophiata*], 962 [*Phoenicurus auroreus leucopterus*].

Blyth (1844). *J. Asiatic Soc. Bengal* **13**: 386 [*Iole*, *Iole olivacea*], 392 [*Chloropsis jerdoni*].

Blyth (1845). *J. Asiatic Soc. Bengal* **14**: 566 [*Pycnonotus cafer bengalensis*], 567 [*Pycnonotus plumosus*], 568 [*Pycnonotus flavescens*, *Pycnonotus brunneus*], 571 [*Spizixos*, *Spizixos canifrons*], 572 [*Hemixos*, *Hemixos flavala*], 573 [*Iole virescens*, *Hemixos cinereus*], 574 [*Ixos malaccensis*], 577 [*Tricholestes criniger*], 589 [*Troglodytes troglodytes nipalensis*].

Blyth (1846). *J. Asiatic Soc. Bengal* **15**: 50 [*Pycnonotus cafer intermedius*], 309 [*Pericrocotus igneus*], 310 [*Pericrocotus solaris*], 370 [*Zoothera citrina innotata*].

Blyth (1847). *J. Asiatic Soc. Bengal* **16**: 129 [*Saxicola torquatus indicus*], 131 [*Oenanthe picata*], 132 [*Tarsiger hyperythrus*], 141 [*Zoothera dauma neilgherriensis*, *Zoothera marginata*], 142 [*Zoothera spiloptera*], 144 [*Turdus dissimilis*], 146 [*Zoothera citrina albogularis*], 150 [*Monticola solitarius longirostris*], 156 [*Enicurus leschenaulti frontalis*], 472 [*Aegithina lafresnayei innotata*], 473 [*Tephrodornis pondicerianus affinis*]. 474 [*Saxicola leucurus*].

Blyth (1849). *J. Asiatic Soc. Bengal* **18**: 816 [*Hypsipetes leucocephalus concolor*].

Blyth (1851). *J. Asiatic Soc. Bengal* **20**: 177 [*Saxicola caprata atratus*], 178 [*Pycnonotus penicillatus*], 523 [*Cercomela fusca*].

Blyth (1852). *Cat. Birds Mus. Asiatic Soc. Bengal*: 327 [*Coracina melaschistos avensis*].

Blyth (1855). *J. Asiatic Soc. Bengal* **24**: 275 [*Ixos mcclellandii tickelli*].

Blyth (1859). *J. Asiatic Soc. Bengal* **27**: 269 [*Copsychus malabaricus albiventris*].

Blyth (1861). *J. Asiatic Soc. Bengal* **30**: 97 [*Lalage melanoleuca*].

Blyth (1866). *Ibis*: 368 [*Coracina macei layardi*].

Blyth (1867). *Ibis*: 14 [*Saxicola jerdoni*].

Bocage (1867). *J. Sci. Math. Phys. e Nat., Acad. Real Sci. Lisboa* **1**: 151 [*Oenanthe monticola albipileata*].

Bocage (1869). *Proc. Zool. Soc. London*: 436 [*Cossypha heuglini subrufescens*].

Bocage (1870). *J. Sci. Math. Phys. e Nat., Acad. Real Sci. Lisboa* **3**: 341 [*Turdus libonyanus verreauxi*].

Boddaert (1783). *Table Planches Enlum*: 38 [*Coracina striata*, *Copsychus saularis mindanensis*], 44 [*Microcerculus bambla*].

Boie (1822). *Isis*: col. 552 [*Monticola*].

Boie (1826). *Isis von Oken* **19**: 972 [*Mimus*, *Pericrocotus*], 973 [*Pycnonotus*, *Lalage*].

Boie (1831). *Isis*: 542 [*Cercotrichas*].

Bonaparte (1827). *Zool. J.* **3**: 52-53 [*Cinclus mexicanus unicolor*].

Bonaparte (1838). *Proc. Zool. Soc. London* **1837**: 118 [*Turdus grayi*].

Bonaparte (1850). *Consp. Av.* **1**: 252 [*Cinclus cinclus leucogaster*, *Cinclus pallasii tenuirostris*], 262 [*Phyllastrephus icterinus*, *Alophoixus bres gutturalis*, *Alophoixus phaeocephalus sulphuratus*, *Thapsinillas affinis flavicaudus*, *Pseudalethe poliocephala*], 265 [*Pycnonotus jocosus pyrrhotis*], 267 [*Copsychus saularis pluto*], 273 [*Turdus pelios*], 274 [*Turdus olivaceus smithi*], 275 [*Turdus merula mandarinus*], 276 [*Melanotis*].

278 [*Catharus*], 300 [*Hodgsonius*], 301 [*Cossypha cyanocampter*], 302 [*Alethe diademata*], 304 [*Saxicola gutturalis luctuosus*], 336 [*Hypocolius, Hypocolius ampelinus*], 354 [*Coracina atriceps magnirostris, Coracina leucopygia*], 355 [*Coracina ceramensis*], 396 [*Chloropsis media*], 397 [*Aegithina tiphia viridis, Aegithina viridissima, Chloropsis venusta*].

Bonaparte (1854). *Compt. Rend. Acad. Sci. Paris* **38**: 2 [*Cichlherminia*], 3 [*Ixoreus*], 7 [*Oenanthe bottae*], 11 [*Bernieria*], 57 [*Campylorhynchus griseus albicilius*], 59 [*Tricholestes criniger viridis*].

Bonaparte (1855). *Compt. Rend. Acad. Sci. Paris* **41**: 657 [*Turdus grayi casius*].

Bonaparte (1856). *Compt. Rend. Acad. Sci. Paris* **42**: 766 [*Cercomela*]; **43**: 998 [*Catharus mexicanus*].

Bonaparte (1857). *Rev. Mag. Zool. Paris, Ser. 2* **9**: 50 [*Bleda*], 205 [*Zoothera dauma horsfieldi*].

Borkhausen (1797). *Deutsche Fauna* **1**: 300 [*Cinclus*].

Borrero & Hernández (1958). *Caldasia* **8(37)**: 277-280 [*Campylorhynchus zonatus imparilis*].

Bourns & Worcester (1894). *Occas. Pap. Minnesota Acad. Nat. Sci.* **1**: 23 [*Zoothera cinerea, Copsychus luzoniensis superciliaris*], 25 [*Ixos siquijorensis monticola, Ixos siquijorensis cinereiceps*].

Bouvier (1877). *Bull. Soc. Zool. France* **2**: 456 [*Zoothera piaggiae*].

Bowen (1932). *Proc. Acad. Nat. Sci. Philadelphia* **83**: 8 [*Saxicola torquatus stonei*].

Bowen (1934). *Proc. Biol. Soc. Washington* **47**: 159 [*Erythropygia leucophrys eluta*].

Brandt, J.F. (1844). *Bull. Phys. Acad. Imp. Sci. St. Pétersbourg* **2**: 140 [*Prunella atrogularis*].

Brehm, C.L. (1831). *Handb. Naturg. Vög. Deutschl.*: 337 [*Turdus torquatus alpestris*], 356 [*Luscinia megarhynchos*], 382 [*Turdus philomelos*], 1009 [*Prunella collaris subalpina*].

Brehm, C.L. (1855). *Vollst. Vog.*: 225 [*Oenanthe leucopyga*].

Brewster (1885). *Auk* **2**: 85 [*Sialia sialis fulva*].

Brewster (1888). *Auk* **5**: 94 [*Troglodytes brunneicollis cahooni*].

Brewster (1889). *Auk* **6**: 96 [*Thryothorus sinaloa cinereus*].

Brewster (1893). *Auk* **10**: 216 [*Cistothorus palustris griseus*].

Brodkorb (1938). *Occas. Pap. Mus. Zool. Univ. Michigan* **369**: 4 [*Catharus dryas ovandensis*].

Brodkorb (1940). *Auk* **57**: 547 [*Campylorhynchus zonatus vulcanius*].

Brodkorb (1942). *Occas. Pap. Mus. Zool. Univ. Michigan* **459**: 7 [*Thryothorus pleurostictus oaxacae*], 9 [*Thryothorus pleurostictus acaciarum*].

Brodkorb (1943). *Occas. Pap. Mus. Zool. Univ. Michigan* **480**: 1 [*Troglodytes rufociliatus chiapensis*].

Brooks, W.E. (1872). *J. Asiatic Soc. Bengal* **41**: 327 [*Prunella strophiata jerdoni*], 328 [*Troglodytes troglodytes neglectus*].

Brooks, W.P. (1915). *Bull. Mus. Comp. Zool.* **59**: 400 [*Troglodytes troglodytes semidiensis*].

Bryan (1908). *Occas. Pap. Bishop Mus.* **4**: 43, 81 [*Myadestes lanaiensis ruthae*].

Buden (1993). *Bull. Brit. Orn. Club* **113(2)**: 82 [*Margarops fuscus atlanticus*], 82-83 [*Margarops fuscus hypenemus*], 83 [*Margarops fuscus schwartzi*].

Burleigh (1935). *Proc. Biol. Soc. Washington* **48**: 61 [*Troglodytes troglodytes pullus*].

Burleigh (1963). *Proc. Biol. Soc. Washington* **76**: 178-179 [*Bombycilla cedrorum larifuga*].

Burleigh & Duvall (1959). *Proc. Biol. Soc. Washington* **72**: 33 [*Catharus fuscescens subpallidus*].

Burleigh & Peters, J.L. (1948). *Proc. Biol. Soc. Washington* **61**: 117 [*Catharus guttatus crymophilus*].

Burmeister (1858). *J. Orn.* **6**: 159 [*Turdus chiguanco anthracinus*].

Büttikofer (1886). *Notes Leyden Mus.* **8**: 155 [*Pericrocotus lansbergei*].

Büttikofer (1887). *Notes Leyden Mus.* **9**: 53 [*Tephrodornis virgatus frenatus*].

Büttikofer (1893). *Notes Leyden Mus.* **15**: 109 [*Turdus poliocephalus celebensis*].

Büttikofer (1896). *Notes Leyden Mus.* **18**: 175 [*Coracina striata kannegieteri*].

Buturlin (1907). *Orn. Monatsber.* **15**: 9 [*Erithacus rubecula caucasicus*].

Buturlin (1910). *Mess. Orn.* **1**: 263 [*Pericrocotus flammeus fohkiensis*].

Buturlin (1929). *Syst. Notes Birds North. Caucasus*: 15 [*Turdus philomelos nataliae*].

Cabanis (1844). *Archiv Naturgeschichte* **10**: 282 [*Cyphorhinus*].

Cabanis (1847). *Archiv Naturgeschichte* **13**: 206 [*Campylorhynchus nuchalis, Henicorhina leucosticta*], 314 [*Pogonocichla*], 323 [*Salpinctes*].

Cabanis (1849). In: Schomburgk, *Reisen Brit. Guiana* **3**: 666 [*Turdus albicollis phaeopygus*], 672 [*Troglodytes rufulus*], 673 [*Thryothorus leucotis albipectus*].

Cabanis (1850). *Mus. Hein., Th. 1*: 4 [*Turdus albicollis assimilis*], 5 [*Turdus amaurochalinus, Catharus aurantiirostris melpomene*], 8 [*Thamnolaea, Myrmecocichla, Myrmecocichla aethiops*], 39 [*Erythropygia galactotes minor*], 40 [*Pentholaea*], 77 [*Cistothorus*].

Cabanis (1851). *Mus. Hein., Th. 1*: 6 [*Zoothera heinei*], 50 [*Cichlopsis*], 54 [*Cichlopsis leucogenys*], 78 [*Thryothorus leucotis venezuelanus*], 80 [*Campylorhynchus griseus minor*], 83 [*Mimus gilvus gracilis*].

Cabanis (1855). *J. Orn.* **3**: 470 [*Mimus gundlachii*].

Cabanis (1860). *J. Orn.* **8**: 182 [*Psophocichla*], 183 [*Turdus viscivorus bonapartei*].

Cabanis (1861). *J. Orn.* **8**: 323 [*Turdus plebejus, Catharus frantzii*], 324 [*Turdus nigrescens*], 402 [*Ptilogonys caudatus*], 407 [*Troglodytes musculus intermedius*], 408 [*Thryothorus rufalbus cumanensis*], 409 [*Thryothorus modestus*].

Cabanis (1868). *J. Orn.* **16**: 412 [*Turdus olivaceus deckeni, Cossypha heuglini intermedia*].

Cabanis (1873). *J. Orn.* **21**: 315 [*Turdus fuscater gigantodes*], 317 [*Cinnycerthia peruana*].

Cabanis (1874). *J. Orn.* **22**: 97 [*Turdus nigriceps*].

Cabanis (1875). *J. Orn.* **23**: 235 [*Cercomela familiaris falkensteini*], 237 [*Neolestes, Neolestes torquatus*].

Cabanis (1876). *J. Orn.* **24**: 92 [*Phyllastrephus fulviventris*], 333 [*Nicator vireo*].

Cabanis (1878). *J. Orn.* **26**: 205, 218 [*Turdus tephronotus*], 205, 219 [*Cossypha semirufa intercedens*].

Cabanis (1880). *Orn. Centralbl.* **5**: 143 [*Erythropygia leucophrys munda*], 174 [*Andropadus gracilis, Chlorocichla flavicollis flavigula*].

Cabanis (1882). *Orn. Centralbl.* **7**: 182-183 [*Cinclus schulzi*].

Cabanis (1882). *J. Orn.* **30**: 320 [*Turdus pelios saturatus, Turdus pelios bocagei*].

Cabanis (1883). *J. Orn.* **31**: 105 [*Troglodytes solstitialis auricularis*].

Cabot (1847). *Proc. Boston Soc. Nat. Hist.* **2**: 258 [*Thryothorus albinucha*].

Cain & Galbraith (1955). *Bull. Brit. Orn. Club* **75**: 90 [*Coracina welchmani amadonis*], 92 [*Turdus poliocephalus sladeni, Zoothera turipavae*].

Campbell, A.G. (1906). *Emu* **5**: 142 [*Zoothera lunulata halmaturina*].

Carriker (1933). *Proc. Acad. Nat. Sci. Philadelphia* **85**: 33 [*Mimus longicaudatus maranonicus*].

Carriker (1935). *Proc. Acad. Nat. Sci. Philadelphia* **87**: 354 [*Cistothorus platensis minimus*].

Cassin (1852). *Proc. Acad. Nat. Sci. Philadelphia* **5**: 348 [*Coracina azurea*].

Cassin (1855). *Proc. Acad. Nat. Sci. Philadelphia* **7**: 328 [*Thescelocichla leucopleura, Baeopogon indicator leucurus*].

Cassin (1856). *Proc. Acad. Nat. Sci. Philadelphia* **8**: 158 [*Criniger calurus, Alethe castanea*], 159 [*Bleda notatus*].

Cassin (1857). *Proc. Acad. Nat. Sci. Philadelphia* **9**: 34 [*Andropadus virens*].

Cassin (1859). *Proc. Acad. Nat. Sci. Philadelphia* **11**: 42 [*Pseudalethe poliocephala compsonota*], 43 [*Criniger chloronotus, Alethe*], 46 [*Andropadus curvirostris, Pyrrhurus*].

Chapin (1948). *Auk* **65**: 444 [*Criniger calurus emini*].

Chapman (1890). *Auk* **7**: 135 [*Mimus saturninus arenaceus*].

Chapman (1912). *Bull. Amer. Mus. Nat. Hist.* **31**: 157 [*Thryothorus nigricapillus connectens*], 158 [*Turdus serranus fuscobrunneus*].

Chapman (1914). *Bull. Amer. Mus. Nat. Hist.* **33**: 179 [*Thryothorus mystacalis amaurogaster*], 181 [*Henicorhina leucophrys brunneiceps*], 182 [*Turdus olivater caucae*], 635 [*Cistothorus apolinari*].

Chapman (1917). *Bull. Amer. Mus. Nat. Hist.* **36**: 524 [*Henicorhina leucosticta albilateralis*].

Chapman (1924). *Amer. Mus. Novit.* **138**: 13 [*Thryothorus euophrys atriceps*], 14 [*Thryothorus sclateri columbianus, Catharus fuscater caniceps*]; **143**: 15 [*Mimus longicaudatus platensis, Cichlopsis leucogenys chubbi*].

Chapman (1925). *Amer. Mus. Novit.* **160**: 1 [*Turdus fuscater quindio*].

Chapman (1929). *Amer. Mus. Novit.* **380**: 22 [*Troglodytes rufulus duidae*], 23 [*Microcerculus ustulatus duidae, Turdus olivater duidae*].

Chapman (1934). *Amer. Mus. Novit.* **672**: 7 [*Cistothorus platensis falklandicus*].

Chapman & Griscom (1924). *Bull. Amer. Mus. Nat. Hist.* **50**: 296 [*Troglodytes musculus carabayae*].

Chasen (1939). *Treubia* **17**: 184 [*Pycnonotus nieuwenhuisii inexspectatus*].

Chasen (1940). *Bull. Brit. Orn. Club* **60**: 97 [*Monticola solitarius madoci*].

Chasen (1941). *Treubia* **18**(Suppl.): 77 [*Pycnonotus squamatus borneensis*].

Chasen & Kloss (1929). *J. Orn.* **2**: 114 [*Alophoixus phaeocephalus connectens*], 115 [*Pycnonotus plumosus insularis*].

Cherrie (1893). *An. Mus. Nac. Costa Rica* **4**: 134 [*Henicorhina leucosticta pittieri*].

Chubb (1909). *Bull. Brit. Orn. Club* **25**: 16 [*Troglodytes cobbi*].

Chubb (1909). *Brooklyn Inst. Arts & Sci. Mus. Bull.* **1**: 387 [*Turdus fumigatus aquilonalis*].

Chubb (1910). *Ibis*: 608 [*Turdus albicollis paraguayensis*].

Chubb (1914). *Bull. Brit. Orn. Club* **33**: 131 [*Turdus ignobilis arthuri*].

Chubb (1920). *Bull. Brit. Orn. Club* **40**: 156 [*Henicorhina leucosticta hauxwelli*].

Clancey (1937). *Bull. Brit. Orn. Club* **57**: 143 [*Troglodytes troglodytes indigenus*].

Clancey (1952). *Ann. Natal Mus.* **12**: 252 [*Thamnolaea cinnamomeiventris autochthones*].

Clancey (1955). *Bull. Brit. Orn. Club* **75**: 74 [*Zoothera gurneyi disruptans*].

Clancey (1956). *Durban Mus. Novit.* **4**: 281 [*Saxicola torquatus oreobates, Cercomela sinuata hypernephela*], 290 [*Psophocichla litsitsirupa pauciguttata*].

Clancey (1957). *Durban Mus. Novit.* **5**: 45 [*Erythropygia paena oriens*].

Clancey (1958). *Durban Mus. Novit.* **5**: 102 [*Cercomela sinuata ensifera*].

Clancey (1959). *Bull. Brit. Orn. Club* **79(9)**: 170 [*Pycnonotus nigricans superior*].

Clancey (1962). *Occas. Pap. Nat. Mus. S. Rhodesia* **26b**: 743 [*Thamnolaea cinnamomeiventris odica*].

Clancey (1965). *Durban Mus. Novit.* **6**: 186 [*Cercomela tractrac nebulosa*]; **8(1)**: 16-17 [*Monticola angolensis hylophilus*].

Clancey (1966). *Durban Mus. Novit.* **7(11)**: 445 [*Cercomela familiaris actuosa*].

Clancey (1969). *Durban Mus. Novit.* **8(15)**: 253 [*Pogonocichla stellata hygrica*].

Clancey (1981). *Durban Mus. Novit.* **13(1)**: 9 [*Cossypha dichroa mimica*].

Clancey (1982). *Durban Mus. Novit.* **13(7)**: 67-68 [*Turdus olivaceus culminans*].

Clancey (1986). *Durban Mus. Novit.* **14(2)**: 18-19 [*Cichladusa guttata intercalans*].

Clarke, S.R. (1919). *Bull. Brit. Orn. Club* **40**: 49 [*Cercomela scotocerca spectatrix*].

Clarke, W.E. (1913). *Scot. Nat.*: 53 [*Turdus philomelos hebridensis*].

Cory (1881). *Bull. Nuttall Orn. Club* **6**: 130 [*Myadestes genibarbis montanus*].

Cory (1886). *Auk* **3**: 381 [*Troglodytes musculus guadeloupensis*].

Cory (1887). *Auk* **4**: 94 [*Ramphocinclus brachyurus sanctaeluciae*], 178 [*Mimus gilvus magnirostris*].

Cory (1891). *Auk* **8**: 44 [*Cichlherminia lherminieri lawrencii*].

Cory (1916). *Field Mus. Nat. Hist. Publ., Orn. Ser.* **1**: 344 [*Cistothorus platensis tamae, Turdus rufiventris juensis*].

Coues (1872). *Key North Amer. Birds*: 351 [*Toxostoma curvirostre palmeri*].

Coues (1873). *Amer. Naturalist* **7**: 330 [*Toxostoma bendirei*].

Coues (1880). *Bull. US Geol. Geogr. Surv. Terr.* **5(4)**: 570 [*Turdus lawrencii*].

Crossin & Ely (1973). *Condor* **75(2)**: 137-138 [*Hylorchilus navai*].

Cunningham-van Someren & Schifter (1981). *Bull. Brit. Orn. Club* **101(3)**: 350 [*Pogonocichla stellata pallidiflava*], 352 [*Pseudalethe poliocephala giloensis*].

Cuvier (1800). *Leçons d'Anat. Comp.* **1**: tab. 2 [*Erithacus*].

Dalmas (1900). *Mém. Soc. Zool. France* **13**: 134 [*Mimus gilvus tobagensis*].

David (1877). In: David & Oustalet, *Oiseaux Chine* **1**: 236 [*Luscinia pectardens*].

De Vis (1890). *Proc. Royal Soc. Queensland* **6**: 242 [*Zoothera lunulata cuneata*].

De Vis (1890). *Ann. Rept. Brit. New Guinea*: 59 [*Coracina longicauda*], 60 [*Turdus poliocephalus papuensis*].

De Vis (1894). *Ann. Rept. Brit. New Guinea*: 105 [*Turdus poliocephalus canescens*].

Dearborn (1907). *Field Mus. Nat. Hist. Publ., Orn. Ser.* **1**: 137 [*Turdus albicollis rubicundus*].

Dearborn (1909). *Field Mus. Nat. Hist. Publ., Orn. Ser.* **1**: 170 [*Pseudalethe poliocephala akeleyae*].

Deignan (1938). *Proc. Biol. Soc. Washington* **52**: 47 [*Pericrocotus solaris nassovicus*].

Deignan (1940). *Smiths. Misc. Coll.* **99**: 2 [*Ixos mcclellandii loquax*].

Deignan (1946). *Smiths. Misc. Coll.* **106**: 1 [*Chloropsis cochinchinensis serithai*]; **108**: 2 [*Chloropsis aurifrons pridii*].

Deignan (1946). *Auk* **63**: 528 [*Pericrocotus flammeus insulanus*].

Deignan (1947). *J. Washington Acad. Sci.* **37**: 254 [*Pericrocotus cinnamomeus thai*], 255 [*Pericrocotus cinnamomeus separatus*].

Deignan (1948). *Proc. Biol. Soc. Washington* **61**: 3 [*Iole virescens cacharensis, Iole virescens myitkyinensis*], 4 [*Iole propinqua aquilonis*], 5 [*Iole propinqua simulator*], 6 [*Iole propinqua innectens*], 13 [*Tephrodornis virgatus jugans*], 14 [*Chloropsis aurifrons incompta, Tephrodornis pondicerianus orientis*].

Deignan (1948). *J. Washington Acad. Sci.* **38**: 246 [*Pycnonotus flaviventris vantynei, Pycnonotus flaviventris xanthops, Pycnonotus flaviventris auratus*], 247 [*Pycnonotus flaviventris caecilii*], 280 [*Pycnonotus jocosus whistleri, Pycnonotus jocosus pattani*].

Deignan (1949). *J. Washington Acad. Sci.* **39**: 275 [*Pycnonotus aurigaster latouchei*], 277 [*Pycnonotus cafer stanfordi, Pycnonotus aurigaster dolichurus*], 278 [*Pycnonotus cafer melanchimus*].

Deignan (1950). *Zoologica* **35**: 127 [*Zoothera citrina gibsonhilli*].

Deignan (1951). *Auk*: 110 [*Pycnonotus cafer humayuni*], 379 [*Turdus fumigatus bondi*].

Deignan (1951). *Proc. Biol. Soc. Washington* **64**: 135 [*Turdus merula sowerbyi*].

Deignan (1952). *Auk*: 465 [*Pycnonotus aurigaster resurrectus*].

Deignan (1954). *J. Washington Acad. Sci.* **44**: 123 [*Pycnonotus flaviventris elbeli, Pycnonotus flaviventris negatus*], 125 [*Iole propinqua lekhakuni*].

Deignan (1955). *Bull. Brit. Orn. Club* **75**: 130 [*Pycnonotus goiavier jambu*].

Deignan (1956). *Smiths. Misc. Coll.* **134**: 4 [*Alophoixus pallidus isani, Alophoixus pallidus khmerensis*], 5 [*Alophoixus ochraceus hallae*].

Deignan (1957). *Proc. Biol. Soc. Washington* **70**: 44 [*Hemixos flavala remotus*].

Deignan (1964). *Bull. Brit. Orn. Club* **84**: 40 [*Prunella collaris fennelli*].

Delacour (1926). *Bull. Brit. Orn. Club* **47**: 13 [*Hemixos flavala bourdellei*].

Delacour (1930). *J. Asiatic Soc. Bengal* **11**: 188 [*Zoothera mollissima griseiceps*].

Delacour (1931). *Oiseau et RFO* **1**: 484 [*Coracina cinerea pallida*].

Delacour (1943). *Zoologica* **28**: 29 [*Pycnonotus aurigaster schauenseei*].

Delacour (1951). *Amer. Mus. Novit.* **1497**: 5 [*Coracina polioptera jabouillei*].

Delacour & Greenway (1939). *Bull. Brit. Orn. Club* **59**: 131 [*Zoothera monticola atrata, Brachypteryx leucophrys langbianensis*].

Delacour & Jabouille (1924). *Bull. Brit. Orn. Club* **45**: 32 [*Alophoixus pallidus annamensis*].

Delacour & Jabouille (1928). *Bull. Brit. Orn. Club* **48**: 130 [*Alophoixus ochraceus cambodianus*], 132 [*Myiomela leucura cambodiana*].

Delacour & Jabouille (1930). *Oiseau et RFO* **11**: 397 [*Heteroxenicus stellatus fuscus, Cinclidium frontale orientale*].

Deppe (1830). *Preis-Verzeichn. Säugeth. Vög.*: 2 [*Thryomanes bewickii mexicanus*].

Desfontaines (1789). *Hist. Acad. R. Sci. Paris*: 500 [*Pycnonotus barbatus*].

Diamond (1969). *Amer. Mus. Novit.* **2362**: 16 [*Coracina montana bicinia*].

Diamond (1989). *Emu* **89**: 58-60 [*Turdus poliocephalus tolokiwae*].

Dickerman (1973). *Condor* **75(3)**: 362 [*Henicorhina leucosticta smithei*], 363 [*Henicorhina leucosticta costaricensis*].

Dickerman (1975). *Amer. Mus. Novit.* **2569**: 4 [*Cistothorus platensis potosinus*], 4-5 [*Cistothorus platensis jalapensis*], 6 [*Cistothorus platensis warneri, Cistothorus platensis russelli*], 7 [*Cistothorus platensis graberi*].

Dickerman (1981). *Bull. Brit. Orn. Club* **101(2)**: 287 [*Turdus grayi lanyoni*].

Dickerman (1997). *Bull. Brit. Orn. Club* **117(1)**: 75 [*Andropadus virens amadoni*].

Dickey & van Rossem (1925). *Proc. Biol. Soc. Washington* **38**: 133 [*Myadestes occidentalis oberholseri*].

Dickey & van Rossem (1927). *Proc. Biol. Soc. Washington* **40**: 3 [*Thryothorus pleurostictus lateralis*].

Dickey & van Rossem (1929). *Ibis*: 265 [*Troglodytes rufociliatus nannoides*].

Dickey & van Rossem (1930). *Condor* **32**: 69 [*Sialia sialis meridionalis*].

Dingle & Sprunt (1932). *Auk* **49**: 454 [*Cistothorus palustris wayneri*].

Dixon (1882). *Ibis*: 563 [*Oenanthe oenanthe seebohmi*].

Dybowski & Taczanowski (1884). *Bull. Soc. Zool. France*: 155 [*Troglodytes troglodytes dauricus*].

Ehrenberg (1833). In: Hemprich and Ehrenberg, *Symb. Phys.*: sig. bb [*Pycnonotus xanthopygos*].
Eisenmann (1950). *Auk* **67**: 366 [*Turdus albicollis coibensis*].
Elliott (1890). *Auk* **7**: 348 [*Copsychus saularis adamsi*].
Elliott (1945). *Bull. Brit. Orn. Club* **66**: 19 [*Pinarochroa sordida olimotiensis*].
Elliott (1954). *Bull. Brit. Orn. Club* **74**: 22 [*Nesocichla eremita procax*].
Érard (1992). *L'Oiseau* **62(3)**: 288 [*Bleda canicapillus morelorum*].
Erlanger (1897). *Orn. Monatsber.* **5**: 192 [*Turdus viscivorus deichleri*].
Eversmann (1841). *Addenda Pallas Zoogr. Rosso-Asiat.* **2**: 11 [*Phoenicurus erythronotus*].
Eydoux & Gervais (1836). *Mag. Zool.*: 9 [*Copsychus albospecularis*].
Eyton (1839). *Proc. Zool. Soc. London* **1839**: 102 [*Pycnonotus melanoleucos*].
Farkas (1971). *Ostrich* **9**(Suppl.): 85 [*Monticola bensoni*].
de Filippi (1863). *Arch. Zool. Anat. Fisiol. Genova* **2**: 380 [*Irania*], 381 [*Oenanthe chrysopygia*].
Finsch (1867). *J. Orn.* **15**: 18 [*Alophoixus phaeocephalus diardi*], 19 [*Iole olivacea charlottae*], 36 [*Thapsinillas longirostris chloris*].
Finsch (1869). *Ibis*: 189 [*Campephaga quiscalina*].
Finsch (1873). In: Finsch & Conrad, *Verh. Kaiserlich-Kong. Zool.-bot. Ges. Wien* **23**: 349 [*Pycnonotus blanfordi conradi*].
Finsch (1876). *Proc. Zool. Soc. London*: 643 [*Coracina tenuirostris insperata*].
Finsch (1901). *Notes Leyden Mus.* **22**: 209 [*Pycnonotus atriceps baweanus*]; **23**: 95 [*Pycnonotus nieuwenhuisii*].
Finsch & Hartlaub (1870). *Vög. Ostafr.*: 259 [*Oenanthe heuglini*], 284 [*Sheppardia bocagei*].
Fischer (1861). *J. Orn.* **9**: 14 [*Troglodytes troglodytes borealis*].
Fischer & Reichenow (1884). *J. Orn.* **32**: 57 [*Pogonocichla stellata orientalis*, *Oenanthe lugens schalowi*], 58 [*Neocossyphus rufus*], 182 [*Luscinia megarhynchos africana*], 262 [*Phyllastrephus flavostriatus tenuirostris*].
Fischer & Reichenow (1884). *Zeitschr. Ges. Orn.* **1**: 301 [*Neocossyphus*].
Fitzpatrick, Terborgh & Willard (1977). *Auk* **94(2)**: 195-201 [*Henicorhina leucoptera*].
Fjeldså, Roy & Kiure (2000). *Bull. Brit. Orn. Club* **120(1)**: 27-28 [*Sheppardia gunningi alticola*].
Forbes, H.O. (1884). *Proc. Zool. Soc. London* **1883**: 589 [*Zoothera machiki*].
Forster, J.R. (1781). *Zool. Indica*: 25 [*Pericrocotus flammeus*], 41 [*Hypsipetes borbonicus*, *Lalage nigra*].
Forster, J.R. (1795). *Faunula Indica*: 8 [*Ixos philippinus*].
Forster, J.R. (1844). *Descr. Anim.*: 266 [*Turdus poliocephalus xanthopus*].
Forster, T. (1817). *Synop. Cat. Brit. Birds*: 14 [*Luscinia*], 53 [*Phoenicurus*].
Fraser (1841). *Proc. Zool. Soc. London* **1840**: 59 [*Turdus fuscater gigas*].
Fraser (1843). *Proc. Zool. Soc. London* **1843**: 27 [*Pycnonotus barbatus inornatus*].
Friedmann (1947). *Auk* **64**: 128 [*Thryothorus rufalbus transfinis*].
Gabrielson & Lincoln (1951). *Proc. Biol. Soc. Washington* **64**: 73 [*Troglodytes troglodytes seguamensis*].
Gambel (1845). *Proc. Acad. Nat. Sci. Philadelphia* **2**: 264 [*Toxostoma redivivum*].
Garrido & Remsen (1996). *Bull. Brit. Orn. Club* **116(2)**: 78-79 [*Margarops fuscatus klinikowskii*].
Gatter (1985). *J. Orn.* **126**: 155 [*Phyllastrephus leucolepis*].
Giraud (1841). *Descr. Sixteen New Species N. Amer. Birds*: 17 [*Catherpes mexicanus albifrons*].
Gmelin, J.F. (1788). *Syst. Nat.* **1(1)**: 367 [*Coracina caledonica*], 371 [*Coracina papuensis*].
Gmelin, J.F. (1789). *Syst. Nat.* **1(2)**: 804 [*Pycnonotus zeylanicus*], 809 [*Turdus jamaicensis*], 814 [*Coracina novaehollandiae*], 815 [*Turdus pallidus*], 816 [*Turdus obscurus*], 817 [*Ixoreus naevius*, *Hylocichla mustelina*], 820 [*Copsychus malabaricus macrourus*, *Oenanthe leucura*], 824 [*Turdus olivaceus abyssinicus*], 825 [*Chloropsis cochinchinensis*, *Thryothorus coraya*], 829 [*Hypsipetes leucocephalus*], 832 [*Turdus aurantius*], 924 [*Aegithina tiphia multicolor*], 939 [*Tephrodornis pondicerianus*], 940 [*Bernieria madagascariensis*, *Saxicola tectes*], 941 [*Pycnonotus melanicterus*, *Pycnonotus cafer haemorrhousus*], 942 [*Pycnonotus sinensis*], 945 [*Myadestes obscurus*], 949 [*Cossypha dichroa*], 965 [*Oenanthe pileata*], 966 [*Oenanthe oenanthe leucorhoa*], 987 [*Phoenicurus ochruros gibraltariensis*], 1012 [*Pericrocotus cinnamomeus malabaricus*].
Gmelin, S.G. (1774). *Reise Russl.* **3**: 101 [*Phoenicurus ochruros*], 105 [*Saxicola torquatus variegatus*].
Godfrey (1952). *Can. Field-Nat.* **65**: 173 [*Catharus ustulatus incanus*].
Gould (1836). *Proc. Zool. Soc. London* **1835**: 186 [*Cinclocerthia ruficauda*, *Pycnonotus gularis*]; **1836**: 6 [*Mimus saturninus modulator*, *Pycnonotus leucotis*, *Alophoixus flaveolus*], 7 [*Zoothera citrina rubecula*].
Gould (1837). *Proc. Zool. Soc. London* **1836**: 89 [*Campylorhynchus brunneicapillus guttatus*, *Uropsila leucogastra*]; **1837**: 27 [*Nesomimus trifasciatus*, *Nesomimus melanotis*, *Nesomimus parvulus*].
Gould (1837). *Icones Avium*: pl. 4 [*Luscinia pectoralis*].
Gould (1846). *Birds Austr.*: 59 [*Pteropodocys*].
Gould (1848). *Proc. Zool. Soc. London* **1848**: 38 [*Coracina papuensis hypoleuca*].
Gould (1850). *Proc. Zool. Soc. London* **1849**: 112 [*Phoenicurus erythrogastrus grandis*].
Gould (1855). *Proc. Zool. Soc. London* **1854**: 285 [*Catharus dryas*]; **1855**: 68 [*Campylorhynchus turdinus hypostictus*], 165 [*Turdus poliocephalus vinitinctus*, *Nesocichla*, *Nesocichla eremita*].
Gould (1860). *Proc. Zool. Soc. London* **1859**: 494 [*Cinclus cinclus cashmeriensis*].
Gould (1863). *Proc. Zool. Soc. London* **1862**: 280 [*Myophonus insularis*], 282 [*Hypsipetes leucocephalus nigerrimus*, *Pericrocotus solaris griseogularis*].
Gould (1866). *Proc. Zool. Soc. London* **1865**: 664 [*Pycnonotus jocosus fuscicaudatus*, *Enicurus maculatus guttatus*], 665 [*Enicurus leschenaulti sinensis*].
Gould (1868). *Proc. Zool. Soc. London* **1868**: 218 [*Heteroxenicus stellatus*].
Grant, C.H.B. & Mackworth-Praed (1937). *Bull. Brit. Orn. Club* **57**: 80 [*Cossypha anomala mbuluensis*], 101 [*Zoothera piaggiae rowei*].
Grant, C.H.B. & Mackworth-Praed (1940). *Bull. Brit. Orn. Club* **60**: 62 [*Phyllastrephus flavostriatus vincenti*].
Grant, C.H.B. & Mackworth-Praed (1941). *Bull. Brit. Orn. Club* **61**: 61 [*Sheppardia lowei*].
Graves & Olson (1986). *Proc. Biol. Soc. Washington* **99(4)**: 580-583 [*Turdus swalesi dodae*].
Gray, G.R. (1840). *List Gen. Birds*: 17 [*Cinclocerthia*], 28 [*Microscelis*].
Gray, G.R. (1846). *Gen. Birds* **1**: 172 [*Myiomela*], 283 [*Coracina boyeri*, *Coracina schisticeps*, *Lalage leucomela rufiventris*].
Gray, G.R. (1846). In: J. E. Gray, *Cat. Mamm. Birds Nepal Thibet*: 81 [*Turdus rubrocanus*].
Gray, G.R. (1847). *Gen. Birds* **1**: 237 [*Pycnonotus goiavier gourdini*].
Gray, G.R. (1858). *Proc. Zool. Soc. London* **1858**: 179 [*Coracina caeruleogrisea*, *Lalage leucomela polygrammica*].
Gray, G.R. (1862). *Ann. and Mag. Nat. Hist.* **Ser. 3, no. 10**: 443 [*Cossypha isabellae*], 444 [*Andropadus tephrolaemus*].
Gray, G.R. (1862). *Proc. Zool. Soc. London* **1861**: 430 [*Lalage atrovirens*].
Gray, G.R. (1871). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 8**: 429 [*Monticola sharpei*].
Gray, J.E. (1831). *Zool. Misc.*: 33 [*Chloropsis cochinchinensis moluccensis*].
Gray, J.E. (1835). *Ill. Ind. Zool.* **2**: pl. 35 [*Pycnonotus leucogenys*].
Gray, J.E. & Gray, G.R. (1847). *Cat. Mamm. Birds Nepal Thibet*: 69, 153 [*Phoenicurus schisticeps*], 70, 153 [*Hodgsonius phaenicuroides*], 71, 153 [*Saxicola insignis*, *Saxicola ferreus*].
Grayson (1868). *Calif. Farmer J. Useful Sci.* **29**: 7 [*Troglodytes sissonii*].
Grinnell (1901). *Auk* **18**: 258 [*Catharus guttatus slevini*].
Grinnell (1909). *Univ. Calif. Publ. Zool.* **5**: 241 [*Turdus migratorius caurinus*].
Grinnell (1910). *Univ. Calif. Publ. Zool.* **5**: 307 [*Thryomanes bewickii marinensis*].
Grinnell (1915). *Pac. Coast Avifauna* **11**: 155 [*Toxostoma redivivum sonomae*].
Grinnell (1918). *Condor* **20**: 89 [*Catharus guttatus polionotus*].
Grinnell (1927). *Condor* **29(2)**: 127 [*Toxostoma crissale trinitatis*].
Griscom (1924). *Amer. Mus. Novit.* **141**: 7 [*Catharus gracilirostris bensoni*], 8 [*Phainoptila melanoxantha minor*].
Griscom (1929). *Bull. Mus. Comp. Zool.* **69**: 182 [*Thryothorus spadix xerampelinus*].
Griscom (1930). *Proc. New England Zool. Cl.* **12**: 5 [*Thryothorus maculipectus microstictus*].
Griscom (1930). *Amer. Mus. Novit.* **438**: 4 [*Catharus mexicanus cantator*], 7 [*Cinclus mexicanus anthonyi*].
Griscom (1932). *Bull. Mus. Comp. Zool.* **72**: 358 [*Thryothorus nigricapillus reditus*], 359 [*Thryothorus leucopogon grisescens*].
Griscom (1932). *Proc. New England Zool. Cl.* **13**: 61 [*Henicorhina leucophrys composita*].
Griscom (1934). *Bull. Mus. Comp. Zool.* **75**: 398 [*Ptilogonys cinereus pallescens*].
Grote (1919). *Orn. Monatsber.* **27**: 62 [*Andropadus nigriceps usambarae*, *Phyllastrephus debilis albigula*].
Grote (1926). *Orn. Monatsber.* **34**: 146 [*Saxicola torquatus voeltzkowi*].
Grote (1928). *Orn. Monatsber.* **36**: 52 [*Erithacus rubecula tataricus*].
Grote (1930). *Bateleur* **2**: 14 [*Erythropygia leucophrys sclateri*].
Grote (1934). *Anz. Orn. Ges. Bayern* **2**: 311 [*Cossyphicula*].
Guérin-Méneville (1843). *Rev. Zool.*: 162 [*Irania gutturalis*].
Guillemard (1885). *Proc. Zool. Soc. London* **1885**: 259 [*Pericrocotus flammeus marchesae*].
Güldenstädt (1775). *Nov. Com. Petrop.* **19**: 468 [*Oenanthe hispanica melanoleuca*], 469 [*Phoenicurus erythrogastrus*].
Gunning & Roberts (1911). *Ann. Transvaal Mus.* **3**: 115 [*Phyllastrephus terrestris intermedius*], 118 [*Monticola brevipes pretoriae*].
Gurney, J.H. Sr (1879). *Ibis*: 390 [*Pycnonotus barbatus layardi*].
Gyldenstolpe (1913). *Kungl. Svenska Vet.-Akad. nya Handl.* **50**: 25 [*Pycnonotus flaviventris johnsoni*].
Gyldenstolpe (1920). *Bull. Brit. Orn. Club* **41**: 12 [*Pycnonotus aurigaster klossi*].
Gyldenstolpe & Mayr (1955). *Arkiv. Zool. (2nd Ser.)* **8(2)**: 389 [*Coracina melas batantae*].
Haagner (1909). *Ann. Transvaal Mus.* **1**: 180 [*Sheppardia*, *Sheppardia gunningi*].
Hablizl (1783). *Neue Nord. Beytr.* **4**: 53 [*Prunella collaris montana*], 56 [*Prunella modularis obscura*], 60 [*Phoenicurus phoenicurus samamisicus*].
Hachisuka (1934). *Tori* **8**: 220 [*Pycnonotus urostictus philippensis*].
Hachisuka (1939). *Orn. Soc. Japan* **15**: 74 [*Pycnonotus jocosus hainanensis*].
Hall, B.P. (1957). *Ibis* **99(2)**: 148 [*Aegithina tiphia deignani*], 150 [*Aegithina tiphia cambodiana*].
Hall, B.P. & Deignan (1956). *Bull. Brit. Orn. Club* **76**: 96 [*Chloropsis cochinchinensis kinneari*].
Harper (1919). *Proc. Biol. Soc. Washington* **32**: 243 [*Prunella modularis mabbotti*].
Harper (1926). *Occas. Pap. Boston Soc. Nat. Hist.* **5**: 221 [*Cistothorus palustris laingi*].
Harrison & Pateff (1937). *Ibis*: 612 [*Prunella modularis meinertzhageni*].
Hartert (1894). *Nov. Zool.* **1**: 477 [*Coracina striata bungurensis*].
Hartert (1895). *Nov. Zool.* **2**: 470 [*Coracina striata difficilis*].
Hartert (1896). *Nov. Zool.* **3**: 70 [*Cataponera*, *Cataponera turdoides*], 170 [*Coracina tenuirostris emancipata*], 555 [*Zoothera dohertyi*], 584 [*Coracina dohertyi*].
Hartert (1897). *Nov. Zool.* **4**: 170 [*Brachypteryx montana floris*].
Hartert (1898). *Nov. Zool.* **5**: 458 [*Coracina personata alfrediana*], 524 [*Coracina papuensis louisiadensis*, *Coracina tenuirostris tagulana*].
Hartert (1898). *Bull. Brit. Orn. Club* **8**: 20 [*Coracina tenuirostris rostrata*].
Hartert (1899). *Bull. Brit. Orn. Club* **8**: 43 [*Zoothera peronii audacis*]; **10**: 5 [*Cossypha albicapillum giffardi*].
Hartert (1900). *Bull. Brit. Orn. Club* **11**: 40 [*Odontorchilus branickii minor*].
Hartert (1901). *Bull. Brit. Orn. Club* **12**: 32 [*Coracina striata vordermani*].
Hartert (1901). *Nov. Zool.* **8**: 313 [*Turdus merula cabrerae*], 317 [*Erithacus rubecula melophilus*].
Hartert (1902). *Nov. Zool.* **9**: 323 [*Turdus merula mauritanicus*], 561 [*Pycnonotus simplex prillwitzi*], 572 [*Copsychus malabaricus omissus*].
Hartert (1903). *Nov. Zool.* **10**: 13 [*Thapsinillas longirostris lucasi*].
Hartert (1905). *Nov. Zool.* **12**: 116 [*Turdus merula azorensis*].
Hartert (1905). *Bull. Brit. Orn. Club* **15**: 46 [*Microscelis amaurotis magnirostris*].
Hartert (1907). *Bull. Brit. Orn. Club* **19**: 50 [*Luscinia ruficeps*], 81 [*Xenocopsychus*], 82 [*Xenocopsychus ansorgei*], 95 [*Erythropygia leucosticta reichenowi*], 96 [*Erythropygia paena benguellensis*, *Erythropygia paena damarensis*], 97 [*Criniger barbatus ansorgeanus*]; **21**: 10 [*Andropadus ansorgei*], 26 [*Troglodytes troglodytes islandicus*].
Hartert (1907). *Vögel Pal. Fauna* **4**: 465 [*Microscelis amaurotis ogawae*].
Hartert (1908). *Bull. Brit. Orn. Club* **23**: 9 [*Cossyphicula roberti rufescentior*].
Hartert (1909). *Nov. Zool.* **16**: 163 [*Cistothorus platensis tucumanus*].
Hartert (1909). *Bull. Brit. Orn. Club* **23**: 54 [*Turdus philomelos clarkei*]; **25**: 32 [*Tarsiger indicus formosanus*].
Hartert (1909). *Vögel Pal. Fauna* **1**: 760 [*Enicurus leschenaulti indicus*].
Hartert (1910). *Vögel Pal. Fauna* **6**: 711 [*Saxicola ferreus haringtoni*], 740 [*Luscinia pectoralis confusa*], 753 [*Erithacus rubecula witherbyi*], 770 [*Prunella fulvescens dresseri*], 776 [*Troglodytes troglodytes taivanus*], 777 [*Troglodytes troglodytes zetlandicus*], 780 [*Troglodytes troglodytes kabylorum*], 783 [*Troglodytes troglodytes szetschuanus*], 784 [*Troglodytes troglodytes ogawae*], 790 [*Cinclus cinclus hibernicus*].
Hartert (1910). *Brit. Birds* **3**: 313 [*Prunella modularis occidentalis*].
Hartert (1910). *Nov. Zool.* **17**: 227 [*Coracina macei larvivora*], 230 [*Pycnonotus sinensis formosae*], 236 [*Zoothera citrina aurimacula*].
Hartert (1910). *J. Orn.* **58**: 173 [*Saxicola torquatus hibernans*], 180 [*Saxicola caprata rossorum*].
Hartert (1916). *Bull. Brit. Orn. Club* **36**: 58 [*Ixos philippinus saturatior*], 87 [*Brachypteryx montana mindorensis*].
Hartert (1917). *Bull. Brit. Orn. Club* **38**: 27 [*Coracina tenuirostris pelingi*], 28 [*Coracina tenuirostris pererrata*, *Coracina sula*].
Hartert (1917). *Nov. Zool.* **24**: 459 [*Monticola rufocinereus sclateri*].
Hartert (1919). *Bull. Brit. Orn. Club* **40**: 52 [*Zoothera citrina courtoisi*].
Hartert (1920). *Nov. Zool.* **27**: 475 [*Turdus obsoletus parambanus*].
Hartert (1921). *Nov. Zool.* **28**: 114 [*Cercomela melanura airensis*].
Hartert (1922). *Bull. Brit. Orn. Club* **42**: 50 [*Andropadus nigriceps neumanni*], 51 [*Saxicola torquatus promiscuus*], 140 [*Troglodytes troglodytes juniperi*].
Hartert (1922). *Nov. Zool.* **29**: 369 [*Andropadus gracilis extremus*].
Hartert (1923). *Vögel Pal. Fauna*: 57 [*Turdus torquatus amicorum*].
Hartert (1924). *Nov. Zool.* **31**: 208 [*Lalage leucomela albidior*], 273 [*Zoothera heinei choiseuli*].
Hartert (1925). *Nov. Zool.* **32**: 131 [*Lalage leucomela falsa*].
Hartert & Butler (1898). *Nov. Zool.* **5**: 506 [*Ixos mcclellandii peracensis*].
Hartert & Hellmayr (1901). *Nov. Zool.* **8**: 492 [*Turdus ignobilis goodfellowi*, *Turdus obsoletus colombianus*].
Hartert & van Someren (1921). *Bull. Brit. Orn. Club* **41**: 64 [*Phyllastrephus debilis rabai*].
Hartlaub (1844). *Rev. Zool.* **7**: 214 [*Turdus rufitorques*], 401 [*Alophoixus phaeocephalus*, *Aegithina lafresnayei*].
Hartlaub (1850). *Rev. Mag. Zool. Paris, Ser. 2* **1**: 158 [*Catharus aurantiirostris*].
Hartlaub (1852). *Rev. Mag. Zool. Paris, Ser. 2* **4**: 4 [*Thryomanes bewickii murinus*], 460 [*Melanotis hypoleucus*].
Hartlaub (1852). *Abh. Geb. Naturw. Hamburg* **2**: 49 [*Turdus olivaceofuscus*].
Hartlaub (1854). *J. Orn.* **2**: 25 [*Bleda canicapillus*].
Hartlaub (1855). *J. Orn.* **3**: 355 [*Stiphrornis*, *Stiphrornis erythrothorax*], 356 [*Chlorocichla simplex*, *Bleda eximius*].
Hartlaub (1857). *Syst. Orn. West-Afr.*: 66 [*Cichladusa ruficauda*].
Hartlaub (1858). *Proc. Zool. Soc. London* **1858**: 292 [*Andropadus virens erythropterus*].
Hartlaub (1860). *Rev. Zool.*: 82 [*Stizorhina fraseri rubicunda*].
Hartlaub (1860). *J. Orn.* **8**: 97 [*Monticola imerina*].
Hartlaub (1861). *Fauna Madagascar*: 44 [*Andropadus importunus insularis*].
Hartlaub (1862). *Ibis*: 341 [*Pycnonotus barbatus tricolor*].
Hartlaub (1864). *Ibis*: 350 [*Zoothera gurneyi*].
Hartlaub (1865). *J. Orn.* **13**: 156 [*Coracina tenuirostris amboinensis*], 160 [*Coracina typica*].
Hartlaub (1866). *J. Orn.* **14**: 36 [*Cossypha heuglini*].
Hartlaub (1866). *Proc. Zool. Soc. London* **1865**: 747 [*Cercomela schlegelii pollux*].
Hartlaub (1882). *Orn. Centralbl.* **7**: 91 [*Pentholaea albifrons clericalis*].
Hartlaub (1883). *J. Orn.* **31**: 425 [*Pyrrhurus scandens orientalis*].
Hartlaub (1886). *Bull. Mus. Royal Hist. Nat. Belgique* **4**: 143 [*Turdus pelios stormsi*].
Hartlaub & Finsch (1870). *Vög. Ostafr.*: 359 [*Nicator*], 360 [*Nicator gularis*], 864 [*Erythropygia barbata*].
Hartlaub & Finsch (1872). *Proc. Zool. Soc. London* **1872**: 98 [*Coracina tenuirostris nesiotis*], 99 [*Coracina tenuirostris monacha*].
Hay (1845). *Madras J. Lit. Sci.* **13**: 157 [*Coracina fimbriata culminata*].
Heine (1860). *J. Orn.* **8**: 139 [*Baeopogon*].
Hellmayr (1901). *Verh. zool.-bot. Ges. Wien* **51**: 770, 774 [*Thryothorus leucotis bogotensis*].
Hellmayr (1901). *Orn. Monatsber.* **9**: 54 [*Zoothera guttata fischeri*].
Hellmayr (1902). *Verh. zool.-bot. Ges. Wien* **52**: 170 [*Thryothorus superciliaris baroni*].
Hellmayr (1902). *J. Orn.* **50**: 45 [*Catharus aurantiirostris costaricensis*], 56 [*Turdus ignobilis debilis*], 61 [*Turdus albicollis contemptus*].

Hellmayr (1903). *Verh. zool.-bot. Ges. Wien* **53**: 220 [*Mimus saturninus frater*].
Hellmayr (1903). *J. Orn.* **51**: 528 [*Henicorhina leucosticta inornata*], 530 [*Henicorhina leucophrys venezuelensis*], 535 [*Thryothorus longirostris bahiae*].
Hellmayr (1906). *Nov. Zool.* **13**: 354 [*Microcerculus marginatus occidentalis*].
Hellmayr (1906). *Bull. Brit. Orn. Club* **16**: 91 [*Turdus fuscater ockendeni*].
Hellmayr (1907). *Bull. Brit. Orn. Club* **19**: 74 [*Cistothorus meridae*].
Hellmayr (1908). *Nov. Zool.* **15**: 17 [*Thryothorus genibarbis intercedens*].
Hellmayr (1919). *Anz. Orn. Ges. Bayern* **1**: 2 [*Troglodytes musculus bonariae*].
Hellmayr (1919). *Verh. Orn. Ges. Bayern* **14**: 126-127 [*Catharus aurantiirostris sierrae*], 127 [*Turdus serranus cumanensis*], 133 [*Turdus poliocephalus niveiceps*].
Hellmayr (1921). *Anz. Orn. Ges. Bayern* **1**: 25 [*Henicorhina leucosticta darienensis*], 27 [*Thryothorus rutilus tobagensis*], 41 [*Thryothorus leucotis peruanus*]; **4**: 27 [*Myadestes ralloides plumbeiceps*].
Hellmayr (1924). *Field Mus. Nat. Hist. Publ., Zool. Ser.* **12**: 74 [*Troglodytes musculus atacamensis*].
Hellmayr (1930). *Nov. Zool.* **35**: 265 [*Cichlopsis leucogenys peruviana*].
Hellmayr (1934). *Field Mus. Nat. Hist. Publ., Zool. Ser.* **13(7)**: 150 [*Campylorhynchus yucatanicus*], 164 [*Thryothorus leucotis zuliensis*].
Hellmayr & Seilern (1915). *Verh. Orn. Ges. Bayern* **12**: 201 [*Mimus gilvus antillarum*].
Hemprich & Ehrenberg (1833). *Symb. Phys., Aves*: fol. bb [*Turdus merula syriacus, Erythropygia galactotes syriaca, Phoenicurus ochruros semirufus, Oenanthe oenanthe libanotica*], fol. dd [*Cercotrichas podobe melanoptera, Oenanthe xanthoprymna*], fol. ee [*Cercomela melanura lypura*].
Henry (1858). *Proc. Acad. Nat. Sci. Philadelphia* **10**: 117 [*Toxostoma crissale*].
Hermann (1783). *Tab. Affin. Anim.*: 211 [*Cyphorhinus arada*].
Heuglin (1862). *J. Orn.* **10**: 300 [*Cichladusa guttata*].
Heuglin (1869). *Orn. Nordost. Afr.* **1**: 350 [*Oenanthe finschii*], 363 [*Cercomela scotocerca*].
Heuglin (1869). *J. Orn.* **17**: 155 [*Oenanthe leucura syenitica*], 158 [*Oenanthe bottae frenata*].
Hodgson (1836). *Indian Rev.* **1**: 327 [*Coracina macei nipalensis*], 328 [*Coracina melaschistos*].
Hodgson (1836). *J. Asiatic Soc. Bengal* **5**: 359 [*Cochoa, Cochoa purpurea*], 359-360 [*Cochoa viridis*].
Hodgson (1836). *As. Res.* **19**: 189 [*Enicurus schistaceus*], 190 [*Enicurus immaculatus*].
Hodgson (1837). *J. Asiatic Soc. Bengal* **6**: 102 [*Luscinia brunnea*].
Hodgson (1837). *Indian Rev.* **1**: 447 [*Tephrodornis virgatus pelvicus*].
Hodgson (1843). *J. Asiatic Soc. Bengal* **12**: 447 [*Grandala, Grandala coelicolor*].
Hodgson (1844). In: Gray. *Zool. Misc.*: 82 [*Chaimarrornis*].
Hodgson (1845). *Proc. Zool. Soc. London* **1845**: 27 [*Tarsiger cyanurus rufilatus, Myiomela leucura*], 28 [*Tarsiger, Tarsiger chrysaeus*], 32 [*Hemipus*], 34 [*Prunella immaculata*].
Holandre (1825). *Ann. Moselle*: 60 [*Zoothera dauma aurea*].
Holdsworth (1872). *Proc. Zool. Soc. London* **1872**: 444 [*Myophonus blighi*].
Hombron & Jacquinot (1841). *Ann. Sci. Nat., Paris* **16**: 313 [*Thapsinillas affinis*].
Homeyer (1884). *Zeitschr. Ges. Orn.* **1**: 397 [*Oenanthe cypriaca*].
Hoogerwerf (1962). *Ardea* **50**: 184 [*Copsychus malabaricus mirabilis*].
Horsfield (1821). *Trans. Linn. Soc. London* **13**: 145 [*Coracina javensis, Lalage nigra striga*], 147 [*Pycnonotus bimaculatus, Pycnonotus goiavier analis, Copsychus saularis amoenus*], 148 [*Turdus poliocephalus javanicus*], 149 [*Myophonus caeruleus flavirostris*], 150 [*Pycnonotus dispar*], 152 [*Aegithina tiphia scapularis*], 153 [*Irena*], 157 [*Brachypteryx, Brachypteryx montana, Saxicola caprata fruticola*].
Horsfield (1840). *Proc. Zool. Soc. London* **1839**: 157 [*Hemipus picatus capitalis*], 159 [*Ixos mcclellandii*, 160-161 [*Pycnonotus jocosus monticola*].
Howe (1900). *Auk* **17**: 271 [*Catharus fuscescens fuliginosus*].
Howell, T.R. (1965). *Auk* **82(3)**: 453-455 [*Sialia sialis caribaea*].
Huey (1942). *Trans. San Diego Nat. Hist. Soc.* **9**: 430 [*Thryomanes bewickii magdalenensis*].
Hume (1872). *Stray Feathers* **1**: 2 [*Oenanthe albonigra*].
Hume (1873). *Stray Feathers* **1**: 297 [*Pycnonotus fuscoflavescens*], 475 [*Myophonus caeruleus eugenei*], 478 [*Alophoixus pallidus griseiceps*].
Hume (1874). *Stray Feathers* **2**: 231 [*Copsychus saularis andamanensis*], 508 [*Hemixos flavala hildebrandi*].
Hume (1875). *Stray Feathers* **3**: 301 [*Pycnonotus finlaysoni davisoni*], 321 [*Pericrocotus flammeus flammifer*].
Hume (1877). *Stray Feathers* **5**: 63 [*Zoothera sibirica davisoni*], 111 [*Hemixos flavala davisoni*], 171, 189 [*Pericrocotus brevirostris neglectus*], 203 [*Coracina fimbriata neglecta*], 205 [*Coracina melaschistos intermedia*].
Hume (1878). *Stray Feathers* **6**: 314 [*Pycnonotus erythropthalmos*].
Hume (1879). *Stray Feathers* **8**: 40 [*Pycnonotus squamatus webberi*].
Ihering, H. von (1905). *Rev. Mus. Paulista* **6**: 431 [*Thryothorus genibarbis juruanus*].
Jackson (1906). *Bull. Brit. Orn. Club* **16**: 46 [*Sheppardia aequatorialis*], 90 [*Neocossyphus poensis praepectoralis*]; **19**: 20 [*Phyllastrephus hypochloris*].
Jackson (1912). *Bull. Brit. Orn. Club* **31**: 18 [*Campephaga quiscalina martini*].
Jany (1955). *J. Orn.* **96**: 104 [*Coracina ceramensis hoogerwerfei*].
Jardine (1831). *Edinburgh J. Nat. Geogr. Sci.* **3**: 211 [*Coracina tenuirostris*].
Jardine (1847). *Ann. and Mag. Nat. Hist.* **Ser. 1, no. 20**: 329 [*Turdus flavipes xanthoscela*].
Jardine & Selby (1827). *Ill. Orn.* **1**: pl. 5 [*Chloropsis, Chloropsis sonnerati*].
Jardine & Selby (1828). *Ill. Orn.* **1**: pl. 46 [*Zoothera citrina cyanota*]; **2**: pl. 57 [*Coracina pectoralis*].
Jardine & Selby (1830). *Ill. Orn.* **2**: 1 [*Chloropsis hardwickii*].
Jardine & Selby (1833). *Ill. Orn.* **3**: pl. 127 [*Alophoixus bres tephrogenys*], pl. 129 [*Monticola rufiventris*].
Jardine & Selby (1837). *Ill. Orn. (New Ser.)* **1**: pl. 2 [*Hypsipetes olivaceus*], pl. 3 [*Pycnonotus eutilotus*].
Jarocki (1819). *Spis. Płaków Król. Warszawa*: 14 [*Turdus atrogularis*].
Jensen & Stuart (1982). *Bull. Brit. Orn. Club* **102(3)**: 96-97 [*Phyllastrephus flavostriatus uzungwensis*], 98 [*Swynnertonia swynnertoni rodgersi*].
Jerdon (1839). *Madras J. Lit. Sci.* **10**: 236 [*Tephrodornis virgatus sylvicola*], 246 [*Pycnonotus priocephalus*], 249 [*Acritillas indica*], 253 [*Turdus simillimus*].
Jerdon (1840). *Madras J. Lit. Sci.* **11**: 17 [*Pericrocotus erythropygius*].
Jerdon (1841). *Madras J. Lit. Sci.* **13**: 170 [*Myiomela major*].
Jerdon (1845). *Madras J. Lit. Sci.* **13**: 122 [*Pycnonotus xantholaemus*].
Jerdon (1862). *Ibis*: 20 [*Pycnonotus blanfordi, Pericrocotus erythropygius albifrons*].
Jerdon & Blyth (1861). *Proc. Zool. Soc. London* **1861**: 201 [*Brachypteryx hyperythra*].
Jouy (1894). *Proc. US Natl. Mus.* **16**: 773 [*Catharus aurantiirostris clarus*].
Junge (1939). *Nova Guinea* **3**: 5 [*Coracina longicauda grisea*], 8 [*Turdus poliocephalus versteegi*].
Kelaart (1851). *J. Asiatic Soc. Bengal* **20**: 177 [*Turdus simillimus kinnisii*].
King, P.P. (1831). *Proc. Com. Sci. Corresp. Zool. Soc. London* **1**: 14 [*Turdus falcklandii magellanicus*].
Kinnear (1924). *Bull. Brit. Orn. Club* **44**: 102 [*Tephrodornis virgatus vernayi*].
Kinnear (1925). *Bull. Brit. Orn. Club* **45**: 105 [*Tephrodornis virgatus latouchei*].
Kinnear (1937). *Ibis*: 263 [*Cinclus pallasii dorjei*].
Kinnear (1938). *Bull. Brit. Orn. Club* **58**: 138 [*Sheppardia gunningi bensoni*].
Kittlitz (1831). *Mém. Acad. Imp. Sci. St. Pétersb.* **1**: 241 [*Microscelis amaurotis squamiceps*].
Kittlitz (1832). *Kupfer. Nat. Vög.*: 7 [*Copsychus luzoniensis*].
Kleinschmidt, O. (1907). *Falco* **3**: 47 [*Luscinia svecica volgae*].
Kloss (1918). *Ibis*: 198 [*Chloropsis aurifrons inornata*].
Kloss (1924). *J. Nat. Hist. Soc. Siam* **6**: 291 [*Pycnonotus aurigaster thais*].
Kloss (1925). *Bull. Brit. Orn. Club* **46**: 7 [*Coracina poliopteraindochinensis*].
Kloss (1926). *J. Malay Branch Roy. Asiatic Soc.* **4**: 159 [*Lalage nigra davisoni*].
Koelz (1939). *Proc. Biol. Soc. Washington* **52**: 63 [*Aegithina tiphia septentrionalis*].
Koenig (1889). *J. Orn.* **37**: 183 [*Erithacus rubecula superbus*].
Kratter & Garrido (1996). *Bull. Brit. Orn. Club* **116(3)**: 189-190 [*Margarops fuscus vincenti*].
Kuroda, Nagamichi (1923). *Bull. Brit. Orn. Club* **43**: 105 [*Pycnonotus sinensis orii*].
Kutter (1882). *Orn. Centralbl.* **7**: 183 [*Coracina striata kochii*].
La Touche (1898). *Bull. Brit. Orn. Club* **8**: 9 [*Brachypteryx leucophrys carolinae*].
La Touche (1922). *Bull. Brit. Orn. Club* **42**: 53 [*Hypsipetes leucocephalus sinensis*], 125 [*Pericrocotus solaris montpellieri*].
Lafresnaye (1835). *Mag. Zool.* **5**: pl. 47 [*Campylorhynchus brunneicapillus*].
Lafresnaye (1836). *Mag. Zool.* **6**: 55-56 [*Thamnolaea cinnamomeiventris*].
Lafresnaye (1838). *Rev. Zool.* **1**: 55 [*Toxostoma longirostre*].
Lafresnaye (1838). *Essai Nouv. Manière Group. Genres Espèc. Passereaux*: 16 [*Cossypha niveicapilla*].
Lafresnaye (1840). *Rev. Zool.* **3**: 65 [*Turdus simillimus nigropileus*], 105 [*Cinnycerthia unirufa*], 259 [*Turdus rufopalliatus rufopalliatus*].
Lafresnaye (1843). *Rev. Zool.* **6**: 66 [*Ramphocinclus*], 67 [*Cinclocerthia ruficauda tremula, Cinclocerthia gutturalis*].
Lafresnaye (1844). *Rev. Zool.* **7**: 41 [*Turdus infuscatus*], 167 [*Cichlherminia lherminieri*].
Lafresnaye (1845). *Rev. Zool.* **8**: 337 [*Thryothorus fasciatoventris, Thryothorus rufalbus*], 338 [*Thryothorus maculipectus, Thryothorus leucotis, Troglodytes musculus striatulus*], 339 [*Campylorhynchus zonatus brevirostris, Campylorhynchus megalopterus*], 341 [*Catharus fuscater*], 367 [*Pycnonotus aurigaster chrysorrhoides*].
Lafresnaye (1846). *Rev. Zool.* **9**: 93 [*Campylorhynchus turdinus unicolor, Campylorhynchus fasciatus pallescens*].
Lafresnaye (1848). *Rev. Zool.* **11**: 2 [*Turdus olivater*], 3 [*Turdus serranus atrosericeus*], 4 [*Turdus nudigenis*], 5 [*Catharus minimus*].
Lafresnaye (1853). *Rev. Mag. Zool. Paris, Ser. 2* **5**: 59 [*Cinnycerthia unirufa unibrunnea*].
Latham (1790). *Index Orn.* **1**: 80 [*Turdus boulboul*], 171 [*Irena puella*], 350 [*Zoothera citrina*], 362 [*Zoothera dauma*], 363 [*Pericrocotus flammeus speciosus*], 367 [*Campephaga phoenicea*]; **2**: 548 [*Cistothorus platensis, Thryothorus ludovicianus*], 554 [*Saxicoloides fulicatus cambaiensis*].
Latham (1801). *Index Orn., Suppl.*: xviii [*Coracina papuensis robusta*], xxiv [*Coracina novaehollandiae melanops*], xl [*Cinclus cinclus gularis*], xlii [*Zoothera lunulata*], 44 [*Turdus poliocephalus*].
Latimer (1961). *Durban Mus. Novit.* **6**: 90 [*Saxicola torquatus clanceyi*].
Laubmann (1920). *Orn. Monatsber.* **28**: 17 [*Turdus mupinensis*].
Lavauden (1929). *Alauda* **1**: 232 [*Monticola erythronota*].
Law (1928). *Condor* **30**: 151 [*Toxostoma curvirostre oberholseri*].
Lawrence (1849). *Ann. Lyceum Nat. Hist. New York* **5**: 35 [*Mimus gilvus melanopterus*].
Lawrence (1851). *Ann. Lyceum Nat. Hist. New York* **5**: 121 [*Toxostoma lecontei*].
Lawrence (1861). *Ann. Lyceum Nat. Hist. New York* **7**: 320 [*Thryothorus leucotis galbraithii*], 321 [*Thryothorus nigricapillus castaneus*].
Lawrence (1862). *Ibis* **4**: 10 [*Campylorhynchus albobrunneus*].
Lawrence (1862). *Ann. Lyceum Nat. Hist. New York* **7**: 470 [*Turdus obsoletus*].
Lawrence (1863). *Ann. Lyceum Nat. Hist. New York* **8**: 5 [*Cyphorhinus phaeocephalus lawrencii*].
Lawrence (1866). *Ann. Lyceum Nat. Hist. New York* **8**: 344 [*Campylorhynchus nuchalis brevipennis*].
Lawrence (1869). *Ann. Lyceum Nat. Hist. New York* **9**: 234 [*Turdus reevei*], 235 [*Thryothorus superciliaris*], 265 [*Turdus hauxwelli*].
Lawrence (1871). *Proc. Acad. Nat. Sci. Philadelphia*: 233 [*Hylorchilus sumichrasti*].
Lawrence (1871). *Ann. Lyceum Nat. Hist. New York* **10**: 1 [*Mimodes graysoni*], 3 [*Cistothorus platensis aequatorialis*].
Lawrence (1877). *Ann. New York Acad. Sci.* **1**: 47 [*Troglodytes musculus rufescens*].
Lawrence (1878). *Ann. New York Acad. Sci.* **1**: 147 [*Myadestes genibarbis sibilans*], 148 [*Troglodytes musculus musicus*], 161 [*Troglodytes musculus grenadensis*].
Lawrence (1880). *Forest & Stream* **14**: 165 [*Cichlherminia lherminieri dominicensis*].
Lawrence (1887). *Ann. New York Acad. Sci.* **4**: 67 [*Uropsila leucogastra brachyura*].
Lawrence (1888). *Auk* **5**: 404 [*Troglodytes musculus tobagensis*].
Layard, E.L. (1854). *Ann. and Mag. Nat. Hist.* **Ser. 2, no. 13**: 212 [*Zoothera imbricata*].
Layard, E.L. (1876). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 17**: 305 [*Turdus poliocephalus vitiensis*].
Layard, E.L. (1876). *Proc. Zool. Soc. London* **1876**: 420 [*Turdus poliocephalus tempesti*].
Lembeye (1850). *Aves Isla Cuba*: 39 [*Myadestes elisabeth*].
Lepechin (1770). *Nov. Com. Petrop.* **14**: 503 [*Oenanthe pleschanka*].
Lesson (1828). *Man. d'Orn.* **1**: 128 [*Coracina melas*].
Lesson (1830). *Voy. 'Coquille' Zool.* **1**: 665 [*Troglodytes musculus chilensis*].
Lesson (1831). In: Bélanger. *Voy. Ind. Orient. Zool.*: 246 [*Myiomela diana*], 255 [*Alophoixus bres*], 270 [*Saxicoloides fulicatus erythrurus*].
Lesson (1831). *Traité d'Orn.* **livr. 5**: 349 [*Coracina macei*].
Lesson (1832). *Cent. Zool.*: 210 [*Campylorhynchus zonatus*].
Lesson (1832). In: Bélanger. *Voy. Ind. Orient. Zool.*: 270 [*Saxicoloides*].
Lesson (1834). *Institut* **2**: 72 [*Cistothorus platensis hornensis*].
Lesson (1838). *Ann. Sci. Nat. Zool.* **Ser. 2, no. 9**: 168 [*Campylorhynchus rufinucha*].
Lesson (1839). *Rev. Zool.* **2**: 167 [*Pycnonotus simplex, Setornis, Setornis criniger, Trichixos, Trichixos pyrropygus*].
Lesson (1840). *Rev. Zool.* **3**: 136 [*Saxicoloides fulicatus leucopterus*].
Lesson (1841). *Rev. Zool.* **3**: 354 [*Pycnonotus luteolus*].
Lesson (1842). *Rev. Zool.* **5**: 174 [*Campylorhynchus rufinucha capistratus*].
Lesson (1844). *Écho du Monde Savant (2nd Ser.)* **11**: col. 182 [*Cinnycerthia*], col. 346 [*Mimus longicaudatus albogriseus*].
Lesson & Garnot (1827). *Voy. 'Coquille' Zool.*: pl. 12 [*Lalage leucomela karu*].
Lichtenstein, M.H.K. (1823). *Verz. Doubl. Zool. Mus. Berlin*: 33 [*Oenanthe lugens, Oenanthe moesta*], 38 [*Turdus albicollis crotopezus, Turdus fumigatus*], 39 [*Mimus saturninus, Pycnonotus barbatus arsinoe*], 51 [*Coracina caesia*].
Linnaeus (1758). *Syst. Nat.* **10(1)**: 95 [*Bombycilla garrulus, Pycnonotus jocosus*], 165 [*Copsychus saularis*], 168 [*Cinclus cinclus, Turdus, Turdus viscivorus, Turdus pilaris*], 169 [*Mimus polyglottos, Mimus polyglottos orpheus, Toxostoma rufum, Turdus plumbeus*], 170 [*Turdus merula, Turdus torquatus, Monticola solitarius*], 184 [*Prunella modularis, Luscinia luscinia*], 186 [*Aegithina tiphia, Saxicola rubetra, Oenanthe oenanthe, Oenanthe hispanica*], 187 [*Pycnonotus jocosus emeria, Sialia sialis, Luscinia svecica, Phoenicurus phoenicurus*], 188 [*Troglodytes troglodytes, Erithacus rubecula*].
Linnaeus (1766). *Syst. Nat.* **12(1)**: 292 [*Turdus iliacus, Turdus olivaceus, Turdus migratorius*], 294 [*Monticola saxatilis*], 295 [*Donacobius atricapilla, Pycnonotus capensis, Pycnonotus cafer*], 316 [*Dulus dominicus*], 328 [*Dumetella carolinensis, Saxicola torquatus*], 332 [*Saxicola torquatus rubicola*], 335 [*Pericrocotus cinnamomeus, Saxicola caprata*], 336 [*Saxicoloides fulicatus*], 337 [*Saxicola torquatus sibilla*], 342 [*Pericrocotus cinnamomeus peregrinus*].
Linnaeus (1771). *Mantissa*: 527 [*Cossypha caffra*].
Lowery (1940). *Auk* **47**: 99 [*Thryothorus ludovicianus burleighi*].
Lowery & Newman (1949). *Occas. Pap. Mus. Zool. La. St. Univ.* **22**: 4 [*Thryothorus ludovicianus tropicalis*], 5 [*Turdus grayi microrhynchus*].
Lynes (1920). *Bull. Brit. Orn. Club* **41**: 17 [*Saxicola torquatus jebelmarrae*], 18 [*Myrmecocichla aethiops sudanensis*].
Lynes (1926). *Ibis*: 391 [*Cercomela scotocerca furensis*], 393 [*Cercomela familiaris angolensis*].
Macdonald (1940). *Bull. Brit. Orn. Club* **60**: 98 [*Zoothera piaggiae hadii*].
Macdonald (1940). *Ibis*: 669 [*Sheppardia sharpei usambarae*], 670 [*Sheppardia aequatorialis acholiensis*].
Macdonald (1952). *Bull. Brit. Orn. Club* **72**: 91 [*Erythropygia coryphaeus cinerea*].
Macdonald (1952). *Ostrich* **23**: 161 [*Oenanthe pileata neseri*].
Madarász (1903). *Ann. Mus. Nat. Hungar.* **1**: 560 [*Cinclus cinclus caucasicus*].
Madarász (1903). *Orn. Monatsber.* **11**: 186 [*Turdus merula aterrimus*].
Madarász (1904). *Ann. Mus. Nat. Hungar.* **2**: 115 [*Thryothorus mystacalis consobrinus*].
Madarász (1913). *Orn. Monatsber.* **21**: 22 [*Donacobius atricapilla brachypterus*].
March (1863). *Proc. Acad. Nat. Sci. Philadelphia*: 291 [*Mimus gundlachii hillii*].
Marshall, G.F.L. (1876). *Stray Feathers* **4**: 410 [*Aegithina nigrolutea*].
Mathews (1912). *Nov. Zool.* **18**: 326 [*Coracina novaehollandiae subpallida*], 329 [*Lalage leucomela yorki*].
Mathews (1912). *Austr. Av. Rec.* **1**: 42 [*Coracina papuensis apsleyi*], 43 [*Coracina tenuirostris melvillensis*].
Mathews (1928). *Nov. Zool.* **34**: 373 [*Coracina welchmani bougainvillei, Coracina melas goodsoni*].
Matschie (1885). *J. Orn.* **33**: 466 [*Cinnycerthia olivascens bogotensis*].
Mauersberger (1971). *J. Orn.* **112**: 442-443 [*Prunella modularis fuscata*].

Mayaud (1934). *Bull. Brit. Orn. Club* **54**: 179 [*Luscinia svecica namnetum*].
Mayr (1931). *Amer. Mus. Novit.* **486**: 18 [*Coracina lineata gracilis*], 21 [*Turdus poliocephalus rennellianus*]; **504**: 16 [*Coracina papuensis eyerdami*], 17 [*Coracina lineata malaitae*], 18 [*Coracina holopolia pygmaea, Coracina holopolia tricolor*].
Mayr (1931). *Mitt. Zool. Mus. Berlin* **17**: 692 [*Turdus poliocephalus keysseri*].
Mayr (1935). *Amer. Mus. Novit.* **820**: 4 [*Coracina lineata makirae, Zoothera margaretae*].
Mayr (1936). *Amer. Mus. Novit.* **869**: 1 [*Lalage leucomela triobriandi*].
Mayr (1940). *Ibis*: 717 [*Pericrocotus ethologus laetus*].
Mayr (1941). *Amer. Mus. Novit.* **1152**: 4 [*Turdus poliocephalus becki, Turdus poliocephalus efatensis, Turdus poliocephalus hades*], 5 [*Turdus poliocephalus placens, Turdus poliocephalus whitneyi, Turdus poliocephalus malekulae*], 6 [*Turdus poliocephalus bougainvillei, Turdus poliocephalus kulambangrae*].
Mayr (1942). *J. Orn.* **89**: 381 [*Hypsipetes leucocephalus leucothorax*], 383 [*Hypsipetes leucocephalus stresemanni*], 385 [*Hypsipetes leucocephalus ambiens*].
Mayr (1944). *Bull. Amer. Mus. Nat. Hist.* **83**: 135, 155 [*Turdus poliocephalus sterlingi*], 156 [*Saxicola caprata cognatus*].
Mayr (1950). *Auk* **67**: 104 [*Coracina tenuirostris nisoria*].
Mayr (1955). *Amer. Mus. Novit.* **1707**: 9 [*Lalage leucomela tabarensis*], 11 [*Coracina tenuirostris ultima*].
Mayr & Gilliard (1951). *Amer. Mus. Novit.* **1524**: 7 [*Turdus poliocephalus carbonarius*], 8 [*Saxicola caprata wahgiensis*].
Mayr & Rand (1936). *Mitt. Zool. Mus. Berlin* **21**: 244 [*Coracina papuensis oriomo*], 245 [*Coracina caeruleogrisea adamsoni*].
Mayr & Ripley (1941). *Auk* **58**: 250 [*Coracina caledonica seiuncta*].
Mayr & Ripley (1941). *Amer. Mus. Novit.* **1116**: 6 [*Lalage maculosa futunae, Lalage maculosa keppeli*], 7 [*Lalage maculosa vauana, Lalage maculosa tabuensis*], 8 [*Lalage maculosa nesophila*], 9 [*Lalage maculosa mixta*], 10 [*Lalage maculosa vanikorensis, Lalage maculosa soror*], 11 [*Lalage maculosa melanopygia, Lalage maculosa ultima, Lalage maculosa modesta*], 12 [*Lalage sharpei tenebrosa*], 16 [*Lalage leucopyga deficiens, Lalage leucopyga deficiens*].
McClelland (1840). *Proc. Zool. Soc. London* **1839**: 157 [*Pericrocotus brevirostris affinis*].
McGregor (1904). *Bull. Phil. Mus.* **3**: 13 [*Pericrocotus flammeus novus*].
McGregor (1905). *Bur. Govt. Lab. Manila* **34**: 19 [*Coracina mindanensis elusa*].
McGregor (1907). *Phil. J. Sci.* **2(A)**: 347 [*Microscelis amaurotis camiguinensis*].
McGregor (1910). *Phil. J. Sci.* **5(2D)**: 112 [*Copsychus luzoniensis parvimaculatus*].
Meade-Waldo (1889). *Ibis*: 504 [*Saxicola dacotiae*].
Mearns (1905). *Proc. Biol. Soc. Washington* **18**: 3 [*Brachypteryx montana mindanensis*], 6 [*Turdus poliocephalus kelleri*].
Mearns (1907). *Phil. J. Sci.* **2(A)**: 355 [*Coracina mcgregori*], 357 [*Microscelis amaurotis batanensis, Turdus poliocephalus malindangensis*], 358 [*Turdus poliocephalus mayonensis*].
Mearns (1909). *Proc. US Natl. Mus.* **36**: 441 [*Brachypteryx montana malindangensis*], 470 [*Pycnonotus goiavier suluensis*].
Mearns (1913). *Smiths. Misc. Coll.* **61**: 1 [*Turdus helleri, Pogonocichla stellata helleri*], 2 [*Cossypha natalensis intensa*], 4 [*Zoothera gurneyi raineyi*].
Meinertzhagen (1924). *Scot. Nat.*: 135 [*Troglodytes troglodytes hebridensis*].
Meinertzhagen (1930). In: Nicoll, *Birds Egypt*: 280 [*Oenanthe leucopyga ernesti*].
Meinertzhagen (1934). *Ibis*: 57 [*Prunella modularis hebridium*].
Meinertzhagen (1949). *Bull. Brit. Orn. Club* **69**: 107 [*Oenanthe lugens vauriei*].
Meise (1929). *J. Orn.* **77**: 461 [*Coracina tenuirostris kalaotuae*].
Meise (1931). *Orn. Monatsber.* **39**: 48 [*Coracina temminckii rileyi*].
Meise (1958). *Abh. Naturwiss. Ver. Hamburg* **2**: 73 [*Cossypha natalensis larischi*].
Meisner (1804). *Syst. Verz. Vögel Schweiz*: 30 [*Luscinia svecica cyanecula*].
Ménétriés (1832). *Cat. Raisonné Objects Zool. Voyage Caucase*: 32 [*Erythropygia galactotes familiaris*].
Meyer, A.B. (1874). *Sitzungsb. Akad. Wiss. Wien* **69**: 386 [*Coracina lineata maforensis, Coracina montana*], 387 [*Coracina incerta*].
Meyer, A.B. (1882). *Verh. zool.-bot. Ges. Wien* **31**: 765 [*Coracina personata sumbensis*].
Meyer, A.B. (1882). *Zeitschr. Ges. Orn.* **1**: 199 [*Coracina papuensis timorlaoensis*].
Meyer, A.B. (1884). *Zeitschr. Ges. Orn.* **1**: 211 [*Zoothera schistacea*].
Meyer, A.B. (1903). *Notes Leyden Mus.* **23**: 187-188 [*Coracina temminckii tonkeana*].
Meyer, A.B. & Wiglesworth (1895). *Abh. Ber. Mus. Dresden* **5(9)**: 5 [*Coracina morio talautensis*].
Meyer de Schauensee (1939). *Notulae Naturae* **18**: 1 [*Turdus poliocephalus loeseri*].
Meyer de Schauensee (1940). *Proc. Acad. Nat. Sci. Philadelphia* **92**: 38 [*Enicurus leschenaulti chaseni*].
Meyer de Schauensee (1946). *Not. Nat. Philadelphia* **161**: 2 [*Cistothorus platensis tolimae*], 6 [*Cyphorhinus phaeocephalus chocoanus*]; **182**: 1 [*Thryothorus nicefori*].
Meyer de Schauensee (1946). *Proc. Acad. Nat. Sci. Philadelphia* **98**: 45 [*Tephrodornis virgatus mekongensis*].
Meyer de Schauensee (1947). *Proc. Acad. Nat. Sci. Philadelphia* **99**: 117 [*Myadestes ralloides candelae*].
Meyer de Schauensee (1951). *Not. Nat. Philadelphia* **232**: 5 [*Thryothorus mystacalis yananchae*].
Miller, W. deW. & Griscom (1925). *Amer. Mus. Novit.* **159**: 8 [*Thryothorus albinucha subfulvus*]; **183**: 3 [*Turdus grayi megas*], 4 [*Turdus plebejus rafaelensis*]; **184**: 12 [*Turdus albicollis atrotinctus*].
Milne-Edwards & Oustalet (1885). *Compt. Rend. Acad. Sci. Paris* **101**: 221 [*Coracina cinerea cucullata, Turdus bewsheri comorensis*], 222 [*Hypsipetes parvirostris*].
Milon (1951). *Bull. Mus. Hist. Nat. Paris, 2nd Ser.* **22**: 706 [*Saxicola torquatus tsaratananae*].
Molina (1782). *Sagg. Stor. Nat. Chile*: 250, 345 [*Mimus thenca*].
Momiyama (1923). *Dobuts. Zasshi* **35**: 401 [*Microscelis amaurotis matchiae*], 402 [*Troglodytes troglodytes mosukei*].
Momiyama (1940). *Dobuts. Zasshi* **52**: 462 [*Zoothera dauma toratugumi*].
Moore, F. (1854). In: Horsfield & F. Moore, *Cat. Birds Mus. Hon. East-India Co.* **1**: 252 [*Alophoixus ochraceus*], 257 [*Ixos nicobariensis*], 274 [*Irena puella malayensis*], 301 [*Phoenicurus ochruros phoenicuroides*], 303 [*Phoenicurus hodgsoni*], 360 [*Prunella atrogularis huttoni*], 361 [*Prunella rubeculoides*], 397 [*Brachypteryx leucophrys nipalensis*].
Moore, R.T. (1935). *Proc. Biol. Soc. Washington* **48**: 112 [*Ptilogonys cinereus otofuscus*].
Moore, R.T. (1937). *Proc. Biol. Soc. Washington* **50**: 201 [*Myadestes townsendi calophonus*], 204 [*Turdus albicollis calliphthongus*].
Moore, R.T. (1939). *Proc. Biol. Soc. Washington* **52**: 125 [*Sialia mexicana amabilis*].
Moore, R.T. (1941). *Proc. Biol. Soc. Washington* **54**: 40 [*Cistothorus platensis tinnulus*], 149 [*Toxostoma crissale dumosum*], 212 [*Toxostoma curvirostre celsum*].
Moreau (1938). *Bull. Brit. Orn. Club* **58**: 64 [*Erythropygia quadrivirgata greenwayi*].
Moreau (1941). *Bull. Brit. Orn. Club* **61**: 46 [*Pseudalethe poliocephala kungwensis*], 60 [*Andropadus masukuensis kungwensis*], 61 [*Sheppardia bocagei kungwensis*]; **62**: 29 [*Phyllastrephus flavostriatus kungwensis*].
Moreau (1942). *Bull. Brit. Orn. Club* **62**: 54 [*Pseudalethe poliocephala ufipae*].
Motley & Dillwyn (1855). *Nat. Hist. Labuan*: 20 [*Copsychus malabaricus stricklandii*].
Müller, A. (1882). *Die Ornis der Insel Salanga*: 32 [*Alophoixus ochraceus cabanisi*].
Müller, S. (1843). *Verh. nat. gesch. Ned., Land-en Volkenk* **6**: 189 [*Coracina morio*], 190 [*Coracina larvata, Coracina personata, Coracina atriceps*], 191 [*Coracina temminckii, Coracina striata sumatrensis*].
Nagamichi Kuroda (1922). *Annot. Zool. Jap.* **10**: 116 [*Microscelis amaurotis harterti*].
Nagamichi Kuroda (1923). *Bull. Brit. Orn. Club* **43**: 106 [*Luscinia akahige tanensis*], 122 [*Microscelis amaurotis borodinonis*].
Naumann, J.F. (1823). *Naturg. Vög. Deutschl.* **3**: 724 [*Cistothorus platensis stellaris, Troglodytes musculus*].
Nelson (1897). *Auk* **14(1)**: 70 [*Campylorhynchus rufinucha nigricaudatus, Salpinctes obsoletus neglectus*], 71 [*Hylorchilus*], 72 [*Uropsila leucogastra pacifica*], 73 [*Henicorhina leucophrys mexicana*], 74 [*Henicorhina leucophrys capitalis*], 75 [*Catharus occidentalis fulvescens*], 75-76 [*Turdus grayi tamaulipensis*].
Nelson (1898). *Proc. Biol. Soc. Washington* **12**: 10 [*Melanotis caerulescens longirostris*], 11 [*Thryothorus felix magdalenae*].
Nelson (1899). *Proc. Biol. Soc. Washington* **13**: 29 [*Thryothorus felix pallidus*], 31 [*Catharus occidentalis olivascens*].
Nelson (1900). *Auk* **17**: 269 [*Thryothorus felix grandis, Toxostoma curvirostre maculatum*].
Nelson (1901). *Proc. Biol. Soc. Washington* **14**: 175 [*Turdus plebejus differens*].
Nelson (1903). *Proc. Biol. Soc. Washington* **16**: 157 [*Thryothorus sinaloa russeus*], 158 [*Troglodytes brunneicollis nitidus, Henicorhina leucophrys festiva*], 159 [*Uropsila leucogastra musica*].
Nelson (1904). *Proc. Biol. Soc. Washington* **17**: 152 [*Cistothorus palustris tolucensis*].
Nelson (1912). *Smiths. Misc. Coll.* **60(3)**: 22 [*Troglodytes ochraceus festinus*], 23 [*Myadestes coloratus*], 24 [*Catharus fuscater mirabilis*].
Neumann (1900). *J. Orn.* **48**: 188, 310 [*Zoothera piaggiae kilimensis*].
Neumann (1903). *Orn. Monatsber.* **11**: 185 [*Andropadus gracilirostris percivali*].
Neumann (1904). *Orn. Monatsber.* **12**: 163 [*Cercomela familiaris omoensis*].
Neumann (1905). *Orn. Monatsber.* **13**: 77 [*Pycnonotus barbatus schoanus*].
Neumann (1906). *Orn. Monatsber.* **14**: 8 [*Pentholaea albifrons pachyrhyncha*].
Neumann (1908). *Bull. Brit. Orn. Club* **21**: 56 [*Turdus pelios graueri, Turdus olivaceus bambusicola*], 77 [*Neocossyphus rufus gabunensis*]; **23**: 11 [*Coracina graueri*], 13 [*Phyllastrephus flavostriatus graueri*].
Neumann (1914). *Orn. Monatsber.* **22**: 9 [*Chlorocichla flavicollis soror*].
Neumann (1915). *Orn. Monatsber.* **23**: 181 [*Coracina macei andamana, Coracina caledonica thilenii*].
Neumann (1917). *Orn. Monatsber.* **25**: 153 [*Coracina schisticeps reichenowi*].
Neumann (1920). *J. Orn.* **68**: 83 [*Erythropygia leucophrys ovamboensis*].
Neumann (1927). *Orn. Monatsber.* **35**: 19 [*Lalage maculosa rotumae, Lalage maculosa pumila*].
Neumann (1939). *Bull. Brit. Orn. Club* **59**: 47 [*Zoothera mendeni*].
Neunzig (1926). *J. Orn.*: 754 [*Pentholaea arnotti harterti*].
Newton, A. (1865). *Ibis*: 332 [*Copsychus sechellarum*].
Newton, E. (1867). *Proc. Zool. Soc. London* **1867**: 299 [*Turdus bewsheri*], 344-345 [*Hypsipetes crassirostris*].
Niethammer (1955). *Bonn. Zool. Beitr.* **6**: 188 [*Cercomela tractrac hoeschi*].
Nikolaus (1982). *Bull. Brit. Orn. Club* **102(2)**: 45-47 [*Zoothera guttata maxis*].
Nuttall (1840). *Man. Orn. US Can. (2nd ed.)*: vi, 400, 830 [*Catharus ustulatus*].
Oates (1889). *Fauna Brit. India, Birds* **1**: 256 [*Alophoixus flaveolus burmanicus*], 259 [*Alophoixus*].
Oates (1890). *Fauna Brit. India, Birds* **2**: 75 [*Oenanthe finschii barnesi*].
Oberholser (1897). *Auk* **14**: 188 [*Cistothorus palustris plesius*].
Oberholser (1898). *Proc. US Natl. Mus.* **21**: 400 [*Thryomanes bewickii calophonus*], 425 [*Thryomanes bewickii cryptus*], 427 [*Thryomanes bewickii eremophilus*], 435 [*Thryomanes bewickii charienturus*], 437 [*Thryomanes bewickii drymoecus*].
Oberholser (1899). *Proc. Acad. Nat. Sci. Philadelphia* **51**: 213 [*Stizorhina*].
Oberholser (1899). *Auk* **16**: 23 [*Catharus ustulatus oedicus*].
Oberholser (1900). *Auk* **17**: 25 [*Troglodytes troglodytes meligerus*].
Oberholser (1900). *Proc. US Natl. Mus.* **22**: 221 [*Oenanthe deserti oreophila*].
Oberholser (1903). *Proc. Biol. Soc. Washington* **19**: 110 [*Cistothorus palustris thryophilus*].
Oberholser (1904). *Proc. US Natl. Mus.* **25**: 207 [*Troglodytes musculus atopus*]; **27**: 198 [*Thryorchilus*].
Oberholser (1905). *Smiths. Misc. Coll.* **48**: 154 [*Thescelocichla*], 161 [*Thapsinillas*], 162 [*Acritillas*], 165 [*Calyptocichla*].
Oberholser (1912). *Smiths. Misc. Coll.* **60**: 9 [*Aegithina tiphia horizoptera*], 10 [*Pycnonotus atriceps hyperemnus*], 11 [*Pycnonotus plumosus porphyreus*], 14 [*Pericrocotus igneus trophis, Pericrocotus flammeus minythomelas*].
Oberholser (1917). *Smiths. Misc. Coll.* **60**: 40 [*Aegithina viridissima thapsina*]; **98**: 43 [*Pycnonotus simplex halizonus*].
Oberholser (1917). *Proc. US Natl. Mus.* **54**: 194 [*Pycnonotus brunneus zapolius*].
Oberholser (1919). *Proc. US Natl. Mus.* **55**: 228 [*Troglodytes troglodytes kiskensis*], 230 [*Troglodytes troglodytes tanagensis*], 232 [*Troglodytes troglodytes petrophilus*].
Oberholser (1919). *Proc. Biol. Soc. Washington* **32**: 128 [*Mimus gilvus antelius*].
Oberholser (1921). *Proc. Biol. Soc. Washington* **34**: 106 [*Turdus albicollis lygrus*].
Oberholser (1930). *Sci. Publ. Cleveland Mus. Nat. Hist.* **1**: 95 [*Catherpes mexicanus meliphonus*].
Oberholser (1930). *Proc. Biol. Soc. Washington* **43**: 151 [*Troglodytes troglodytes stevensoni*].
Oberholser (1932). *Sci. Publ. Cleveland Mus. Nat. Hist.* **4**: 8 [*Thryomanes bewickii atrestus*].
Ogawa (1905). *Annot. Zool. Jap.* **5**: 178 [*Zoothera dauma major*].
Ogilvie-Grant (1894). *Bull. Brit. Orn. Club* **3**: 49 [*Rhyacornis bicolor*].
Ogilvie-Grant (1895). *Bull. Brit. Orn. Club* **4**: 40 [*Brachypteryx montana poliogyna*]; **5**: ii [*Microscelis amaurotis fugensis*].
Ogilvie-Grant (1896). *Ibis*: 465 [*Turdus poliocephalus mindorensis*], 526 [*Brachypteryx montana brunneiceps*], 544 [*Turdus poliocephalus nigrorum*].
Ogilvie-Grant (1905). *Bull. Brit. Orn. Club* **15**: 69 [*Myophonus robinsoni*]; **16**: 18 [*Pericrocotus flammeus johnstoniae*].
Ogilvie-Grant (1906). *Bull. Brit. Orn. Club* **16**: 118 [*Tarsiger johnstoniae, Rhyacornis fuliginosa affinis*]; **19**: 10 [*Brachypteryx leucophrys wrayi*], 24 [*Alethe castanea woosnami, Erythropygia galactotes hamertoni*], 25 [*Pseudalethe poliocephala carruthersi*], 33 [*Pogonocichla stellata ruwenzorii*].
Ogilvie-Grant (1907). *Bull. Brit. Orn. Club* **19**: 87 [*Bleda syndactylus woosnami*].
Ogilvie-Grant (1910). *Proc. Zool. Soc. London* **1910**: 18 [*Tephrodornis virgatus hainanus*].
Ogilvie-Grant (1911). *Bull. Brit. Orn. Club* **27**: 56 [*Pogonocichla stellata elgonensis*].
Ogilvie-Grant (1912). *Bull. Brit. Orn. Club* **29**: 108 [*Brachypteryx montana goodfellowi*].
Ogilvie-Grant (1913). *Bull. Brit. Orn. Club* **31**: 86 [*Turdus menachensis*], 88 [*Prunella fagani*].
Olphe-Galliard (1852). *Ann. Soc. Agr. Lyon* **Ser. 2, no. 4**: 101 [*Phoenicurus moussieri*].
Olrog (1973). *Acta Zool. Lilloana* **30**: 7-11 [*Catharus dryas blakei*].
van Oort (1911). *Notes Leyden Mus.* **34**: 46 [*Pycnonotus bimaculatus tenggerensis*].
d'Orbigny (1838). *Voy. Am. Mérid.*: 230 [*Cyphorhinus arada modulator*].
d'Orbigny (1840). *Voy. Am. Mérid.*: 322 [*Myadestes ralloides*].
d'Orbigny & Lafresnaye (1837). *Mag. Zool.* **7(2)**: 16 [*Turdus fuscater, Turdus chiguanco*], 18 [*Mimus dorsalis*], 19 [*Donacobius atricapilla albovittatus, Mimus patagonicus*], 25 [*Troglodytes musculus tecellatus*], 26 [*Thryothorus guarayanus*].
Osgood (1901). *Auk* **18**: 181 [*Troglodytes troglodytes helleri*].
Oustalet (1855). *Nouv. Arch. Mus. Hist. Nat. Paris* **2(8)**: 285 [*Aegithina tiphia philipi*].
Oustalet (1878). *Bull. Soc. Philom. Paris* **Ser. 7, no. 2**: 54 [*Pycnonotus aurigaster germani*].
Oustalet (1884). *Ann. Sci. Nat., Zool.* **17**: 1 [*Campephaga petiti*].
Oustalet (1886). *Naturaliste* **2(8)**: 300 [*Myrmecocichla tholloni*].
Oustalet (1892). *Naturaliste* **Ser. 2, no. 6**: 218 [*Phyllastrephus xavieri*].
Oustalet (1896). *Bull. Mus. Hist. Nat. Paris* **2**: 185 [*Alophoixus pallidus henrici*].
Oustalet (1903). *Nouv. Arch. Mus. Hist. Nat.* **5**: 76 [*Iole propinqua*].
Pakenham (1935). *Bull. Brit. Orn. Club* **55**: 111 [*Andropadus virens zanzibaricus*].
Pallas (1773). *Reise Verschiedene Provinzen Russischen Reichs* **2**: 428 [*Saxicola torquatus maurus*], 709 [*Tarsiger cyanurus*].
Pallas (1776). *Reise Verschiedene Provinzen Russischen Reichs* **3**: 694 [*Turdus ruficollis, Zoothera sibirica*], 695 [*Prunella montanella, Phoenicurus auroreus*], 697 [*Luscinia cyane, Luscinia calliope*].
Pallas (1811). *Zoographia Rosso-Asiat.* **1**: 465 [*Catharus guttatus*].
Parker & O'Neill (1985). *Orn. Monogr.* **36**: 9-10 [*Thryothorus eisenmanni*], 12-13 [*Thryothorus euophrys schulenbergi*].
Parkes (1960). *Proc. Biol. Soc. Washington* **73**: 59 [*Saxicola caprata randi*].
Parkes (1967). *Bull. Brit. Orn. Club* **87**: 24 [*Pycnonotus urostictus atricaudatus*].
Parkes (1971). *Nemouria* **4**: 21 [*Coracina mindanensis lecroyae, Coracina mindanensis ripleyi*].
Parkes (1981). *Bull. Brit. Orn. Club* **101(4)**: 370 [*Pericrocotus flammeus nigroluteus*].
Parrot (1908). *Verh. Orn. Ges. Bayern* **8**: 124 [*Saxicola torquatus stejnegeri*].
Peale (1848). *US Expl. Exped.*: 81 [*Lalage maculosa*].
Pelzeln (1856). *Anz. K. Akad. Wiss. Wien, Math.-Naturw. Kl.* **20**: 157 [*Chloropsis aurifrons frontalis*].
Pelzeln (1858). *Sitzungsb. K. Akad. Wiss. Wien, Math.-naturwiss. Kl.* **31**: 323 [*Copsychus albospecularis pica*].
Pelzeln (1865). *Reise 'Novara', Vög.*: 80 [*Coracina fimbriata schierbrandi*].
Pelzeln (1868). *Orn. Bras.* **1**: 67 [*Odontorchilus cinereus*].

Pelzeln (1875). *Ibis*: 330 [*Campylorhynchus griseus bicolor*].
Peters, J.L. & Mayr (1960). *Check-list of Birds of the World* **9**: 187 [*Coracina tenuirostris numforana*].
Peters, W.K.H. (1863). *Monatsb. K. Acad. Berlin*: 134 [*Cichladusa, Cichladusa arquata*].
Peters, W.K.H. (1868). *J. Orn.* **16**: 133 [*Andropadus importunus oleaginus*].
Peters, W.K.H. (1881). *J. Orn.* **29**: 50 [*Turdus libonyanus tropicalis*].
Phelps, Jr & Aveledo (1984). *Bol. Soc. Venez. Cienc. Nat.* **39(142)**: 6-7 [*Troglodytes rufulus marahuacae*].
Phelps, Sr & Gilliard (1941). *Amer. Mus. Novit.* **1153**: 9 [*Thryothorus mystacalis tachirensis*].
Phelps, Sr & Phelps, Jr (1946). *Bol. Soc. Venez. Cienc. Nat.* **10**: 231 [*Turdus olivater paraquensis*], 232 [*Turdus olivater ptaritepui*].
Phelps, Sr & Phelps, Jr (1947). *Proc. Biol. Soc. Washington* **60**: 158 [*Campylorhynchus griseus pallidus*].
Phelps, Sr & Phelps, Jr (1948). *Proc. Biol. Soc. Washington* **61**: 171 [*Margarops fuscatus bonairensis*].
Phelps, Sr & Phelps, Jr (1949). *Proc. Biol. Soc. Washington* **62**: 118 [*Troglodytes rufulus yavii*].
Phelps, Sr & Phelps, Jr (1953). *Proc. Biol. Soc. Washington* **66**: [*Turdus fuscater clarus*].
Phelps, Sr & Phelps, Jr (1955). *Proc. Biol. Soc. Washington* **68**: 118 [*Troglodytes rufulus wetmorei*], 119 [*Turdus olivater kemptoni*].
Phelps, Sr & Phelps, Jr (1959). *Proc. Biol. Soc. Washington* **72**: 124 [*Henicorhina leucophrys sanluisensis*].
Phillips, A.R. (1966). *Bull. Brit. Orn. Club* **86(7)**: 126 [*Henicorhina leucophrys minuscula, Cinclus mexicanus dickermani*], 127 [*Catherpes mexicanus cantator, Turdus grayi linnaei*].
Phillips, A.R. (1969). *Auk* **86(4)**: 612-613 [*Catharus occidentalis lambi*], 615 [*Catharus frantzii wetmorei*], 616 [*Catharus frantzii waldroni*], 617 [*Catharus frantzii chiapensis*], 618-619 [*Catharus frantzii nelsoni*].
Phillips, A.R. (1986). *Known Birds North & Middle America* **1**: 123-124 [*Campylorhynchus rufinucha nicoyae*], 130 [*Henicorhina leucosticta decolorata*], 130-131 [*Henicorhina leucosticta alexandri*], 133 [*Uropsila leucogastra centralis, Uropsila leucogastra restricta*], 145 [*Troglodytes musculus pallidipes*], 151 [*Thryomanes bewickii pulichi*], 153 [*Thryomanes bewickii sadai*], 164 [*Thryothorus rufalbus sylvus, Thryothorus rufalbus skutchi*], 169-170 [*Catherpes mexicanus pallidior*], 170 [*Catherpes mexicanus croizati*].
Phillips, A.R. (1991). *Known Birds North & Middle America* **2**: 44 [*Ixoreus naevius carlottae; Ixoreus naevius godfreii*], 45 [*Ridgwayia pinicola maternalis*], 59 [*Turdus rufopalliatus interior*], 63 [*Turdus albicollis suttoni, Turdus albicollis hondurensis*], 64 [*Turdus albicollis benti*], 65 [*Turdus albicollis campanicola, Turdus albicollis croizati*], 68 [*Turdus grayi yucatanensis*], 110 [*Catharus mexicanus yaegeri*], 111 [*Catharus mexicanus carrikeri*], 116 [*Sialia sialis nidificans*], 120 [*Sialia mexicana jacoti*], 121 [*Sialia mexicana nelsoni*].
Phillips, E.L. (1895). *Bull. Brit. Orn. Club* **4**: 36 [*Turdus ludoviciae*].
Pleske (1889). *Wiss. Result. Przewalski Reise, Zool.* **2**: 46 [*Saxicola torquatus przewalskii*].
Poliakov (1915). *Mess. Orn.* **6(2)**: 137 [*Bombycilla garrulus centralasiae*].
Pollen (1866). *Ibis*: 278 [*Coracina newtoni*].
du Pont (1972). *Nemouria* **7**: 9 [*Coracina coerulescens deschauenseei*].
du Pont (1976). *Nemouria* **17**: 7-8 [*Copsychus luzoniensis shemleyi*].
du Pont (1980). *Nemouria* **24**: 4 [*Ixos philippinus parkesi*].
Portenko (1929). *Compt. Rend. Acad. Sci. Leningrad, Ser. A*: 220 [*Prunella montanella badia*].
Portenko (1954). *Birds USSR* **3**: 193 [*Erithacus rubecula valens*].
Prigogine (1952). *Rev. Zool. Bot. Afr.* **46**: 409 [*Sheppardia bocagei schoutedeni*].
Prigogine (1954). *Rev. Zool. Bot. Afr.* **49**: 348 [*Chlorocichla laetissima schoutedeni*].
Prigogine (1955). *Rev. Zool. Bot. Afr.* **52**: 33 [*Cossypha archeri kimbutui*], 181 [*Sheppardia bocagei kaboboensis*].
Prigogine (1957). *Rev. Zool. Bot. Afr.* **55**: 42 [*Pseudalethe poliophrys kaboboensis*].
Prigogine (1978). *Gerfaut* **68**: 489 [*Zoothera camaronensis kibalensis*].
Prigogine (1984). *Gerfaut* **74**: 181-182 [*Pseudalethe poliocephala vandeweghei*].
Prigogine (1985). *Gerfaut* **74**: 386-387 [*Zoothera piaggiae ruwenzorii*].
Prigogine (1987). *Bull. Brit. Orn. Club* **107(2)**: 52 [*Sheppardia bocagei ilyai*].
Prigogine & Louette (1984). *Gerfaut* **74**: 185-186 [*Zoothera guttata lippensi*].
Przevalski (1876). *Mongol. i Strana Tangut.* **2**: 40 [*Phoenicurus alaschanicus*], 44 [*Luscinia pectoralis tschebaiewi*], 62 [*Turdus kessleri*].
Przevalski (1887). *Zapiski Imp. Akad. Nauk, St. Pétersbourg* **55**: 83 [*Prunella koslowi*].
Quoy & Gaimard (1824). In: Freycinet, *Voy. de la 'Uranie', Zool.* **livr. 3**: 104 [*Turdus falcklandii*].
Quoy & Gaimard (1830). *Voy. 'Astrolabe', Zool.* **1**: 188 [*Turdus poliocephalus vanikorensis*].
Radde (1884). *Ornis Caucasica*: 33, 244 [*Prunella ocularis*].
Raffles (1822). *Trans. Linn. Soc. London* **13**: 305 [*Pericrocotus divaricatus*], 307 [*Copsychus saularis musicus*], 309 [*Pericrocotus flammeus xanthogaster*].
Ramos (1991). In: Phillips, *Known Birds North & Middle America* **2**: 90 [*Catharus ustulatus appalachiensis*], 92 [*Catharus ustulatus phillipsi*].
Ramsay, E.P. (1876). *Proc. Linn. Soc. New South Wales* **1**: 43 [*Turdus poliocephalus ruficeps*].
Ramsay, E.P. (1879). *Proc. Linn. Soc. New South Wales* **3**: 336 [*Turdus poliocephalus albifrons*]; **4**: 71 [*Coracina lineata pusilla*].
Ramsay, E.P. (1881). *Proc. Linn. Soc. New South Wales* **6**: 176 [*Coracina papuensis elegans*].
Ramsay, R.G.W. (1880). *Proc. Zool. Soc. London* **1880**: 16 [*Myophonus castaneus*].
Ramsay, R.G.W. (1882). *Ann. and Mag. Nat. Hist.* **Ser. 5, no. 10**: 431 [*Alophoixus ochraceus sumatranus, Ixos virescens sumatranus*].
Rand (1940). *Amer. Mus. Novit.* **1072**: 4 [*Saxicola caprata belensis*].
Rand (1948). *Fieldiana Zool.* **31**: 203 [*Irena cyanogastra hoogstraali*].
Rand (1955). *Fieldiana Zool.* **34**: 327 [*Cossypha heinrichi*], 336 [*Phyllastrephus albigularis viridiceps*].
Rand (1957). *Fieldiana Zool.* **39**: 41 [*Sheppardia gabela*].
Rand & Rabor (1959). *Fieldiana Zool.* **39(26)**: 276 [*Coracina striata boholensis*].
Rand & Rabor (1960). *Fieldiana Zool.* **35(7)**: 346 [*Pycnonotus goiavier samarensis*].
Rand & Rabor (1967). *Fieldiana Zool.* **51(6)**: 86 [*Pycnonotus urostictus ilokensis, Brachypteryx montana andersoni*].
Rand & Rabor (1969). *Fieldiana Zool.* **51(13)**: 161 [*Ixos everetti catarmanensis*].
Rea (1986). In: Phillips, *Known Birds North & Middle America* **1**: 114-115 [*Cistothorus palustris browningi*], 116 [*Cistothorus palustris deserticola*], 119 [*Campylorhynchus brunneicapillus sandiegense*], 138-139 [*Troglodytes troglodytes ochroleucus*], 140 [*Troglodytes troglodytes obscurior, Troglodytes troglodytes muiri*].
Reichenbach (1850). *Av. Syst. Nat.*: pl. 54 [*Lobotos*].
Reichenow (1874). *J. Orn.* **22**: 458 [*Chlorocichla falkensteini*].
Reichenow (1879). *Orn. Centralbl.* **1**: 114 [*Erythropygia quadrivirgata*], 139 [*Phyllastrephus strepitans, Phyllastrephus fischeri*].
Reichenow (1887). *J. Orn.* **35**: 74 [*Chlorocichla flaviventris centralis*], 78 [*Thamnolaea cinnamomeiventris subrufipennis*].
Reichenow (1891). *J. Orn.* **39**: 62 [*Erythropygia leucophrys vulpina*], 63 [*Erythropygia leucophrys brunneiceps, Erythropygia hartlaubi*].
Reichenow (1892). *J. Orn.* **40**: 59 [*Sheppardia polioptera*], 188 [*Andropadus montanus*], 189, 220 [*Phyllastrephus poliocephalus*], 194 [*Turdus pelios nigrilorum*].
Reichenow (1895). *Orn. Monatsber.* **3**: 96 [*Phyllastrephus baumanni*].
Reichenow (1897). *J. Orn.* **45**: 45 [*Andropadus latirostris congener*].
Reichenow (1899). *Orn. Monatsber.* **7**: 8 [*Andropadus nigriceps chlorigula*].
Reichenow (1900). *Orn. Monatsber.* **8**: 5 [*Psophocichla litsitsirupa stierlingi, Cossypha caffra iolaema*], 99 [*Pseudalethe fuelleborni*].
Reichenow (1902). *Orn. Monatsber.* **10**: 78 [*Cercomela familiaris hellmayri*], 157 [*Thamnolaea cinnamomeiventris coronata*].
Reichenow (1902). *J. Orn.* **50**: [*Stizorhina fraseri vulpina*].
Reichenow (1903). *J. Orn.* **51**: 544 [*Phyllastrephus cabanisi sucosus*].
Reichenow (1904). *Vög. Afr.* **3**: 383 [*Criniger ndussumensis*], 405 [*Phyllastrephus terrestris suahelicus*].
Reichenow (1904). *Orn. Monatsber.* **12**: 95 [*Turdus olivaceus nyikae, Zoothera gurneyi otomitra*].
Reichenow (1905). *Vög. Afr.* **3**: 690 [*Turdus pelios centralis*], 840 [*Pycnonotus barbatus somaliensis*], 841 [*Pycnonotus barbatus spurius*].
Reichenow (1905). *Orn. Monatsber.* **13**: 181 [*Andropadus masukuensis roehli*], 182 [*Turdus olivaceus roehli*].
Reichenow (1907). *Orn. Monatsber.* **15**: 30 [*Sheppardia montana*].
Reichenow (1908). *Orn. Monatsber.* **16**: 47 [*Phyllastrephus flavostriatus olivaceogriseus*], 191 [*Bombycilla garrulus pallidiceps*].
Reichenow (1910). *Orn. Monatsber.* **18**: 7 [*Sheppardia polioptera nigriceps*].
Reichenow (1915). *Orn. Monatsber.* **23**: 91 [*Campephaga quiscalina munzneri*].
Reichenow (1917). *J. Orn.* **65**: 391 [*Turdus olivaceus pondoensis*].
Reichenow (1921). *J. Orn.* **69**: 49 [*Pentholaea albifrons limbata, Sheppardia polioptera tessmanni*].
Reichenow (1932). *Verh. Orn. Ges. Bayern*: 584 [*Cossypha anomala grotei*].
Reichenow & Newmann (1895). *Orn. Monatsber.* **3**: 74 [*Andropadus milanjensis striifacies*], 76 [*Pogonocichla stellata guttifer*].
Remsen & Brumfield (1998). *Proc. Biol. Soc. Washington* **111(4)**: 1008-1010 [*Cinnycerthia fulva fitzpatricki*], 1012-1013 [*Cinnycerthia fulva gravesi*].
Rensch (1928). *Orn. Monatsber.* **36**: 47 [*Pericrocotus flammeus siebersi*].
Rensch (1931). *Treubia* **13**: 380 [*Saxicola caprata francki*].
Richmond (1896). *Proc. US Natl. Mus.* **18**: 484 [*Luscinia svecica abbotti*], 585 [*Turdus merula intermedius*].
Richmond (1897). *Proc. US Natl. Mus.* **19**: 688 [*Copsychus albospecularis inexpectatus*].
Richmond (1903). *Proc. US Natl. Mus.* **26**: 513 [*Coracina striata simalurensis, Coracina striata babiensis*], 514 [*Coracina fimbriata compta*].
Richmond (1907). In: Blackwelder, *Publ. Carnegie Inst. Washington* **54(1)**: 498 [*Troglodytes troglodytes idius*].
Richmond (1915). *Proc. Biol. Soc. Washington* **28**: 180 [*Odontorchilus*].
Rickett & La Touche (1897). *Bull. Brit. Orn. Club* **6**: 50 [*Brachypteryx montana sinensis*].
Ridgway (1873). *Amer. Naturalist* **7**: 603 [*Catherpes mexicanus conspersus*].
Ridgway (1875). *Amer. Naturalist* **9**: 469 [*Thryothorus ludovicianus miamensis*].
Ridgway (1876). *Bull. US Geol. Geogr. Surv. Terr.* **2**: 185 [*Salpinctes obsoletus guadeloupensis*].
Ridgway (1877). *Bull. Nuttall Orn. Club* **2**: 9 [*Turdus migratorius propinquus*].
Ridgway (1878). *Bull. Nuttall Orn. Club* **3**: 10 [*Thryothorus felix lawrencii*].
Ridgway (1878). *Proc. US Natl. Mus.* **1**: 252 [*Thryothorus zeledoni*].
Ridgway (1882). *Proc. US Natl. Mus.* **4**: 334 [*Troglodytes ochraceus*], 374 [*Catharus fuscescens salicicola*], 377 [*Catharus bicknelli*]; **5**: 9 [*Toxostoma curvirostre occidentale*], 12 [*Turdus rufopalliatus graysoni*], 13 [*Sialia sialis guatemalae*], 45 [*Mimodes*].
Ridgway (1883). *Proc. US Natl. Mus.* **6**: 93 [*Troglodytes troglodytes pallescens*].
Ridgway (1884). *Proc. US Natl. Mus.* **7**: 173 [*Mimus gilvus rostratus*].
Ridgway (1885). *Proc. Biol. Soc. Washington* **3**: 21 [*Troglodytes beani, Toxostoma guttatum*].
Ridgway (1887). *Man. No. Am. Birds*: 464 [*Ptilogonys cinereus molybdophanes*], 552 [*Thryothorus maculipectus canobrunneus, Thryothorus maculipectus umbrinus*].
Ridgway (1888). *Proc. US Natl. Mus.* **10**: 506 [*Mimus gilvus leucophaeus, Toxostoma longirostre sennetti*], 507 [*Campylorhynchus rufinucha castaneus*], 516 [*Thryothorus coraya herberti*], 518 [*Cyphorhinus arada griseolateralis*].
Ridgway (1888). *Proc. Boston Soc. Nat. Hist.* **23**: 385 [*Campylorhynchus zonatus curvirostris*].
Ridgway (1890). *Proc. US Natl. Mus.* **12**: 102 [*Nesomimus*], 103 [*Nesomimus macdonaldi*], 104 [*Nesomimus parvulus personatus*].
Ridgway (1893). *Proc. US Natl. Mus.* **16**: 597 [*Hypsipetes madagascariensis rostratus*].
Ridgway (1894). *Proc. US Natl. Mus.* **17**: 357 [*Nesomimus parvulus bauri*].
Ridgway (1894). *Auk* **11**: 151 [*Sialia mexicana bairdi*].
Ridgway (1903). *Proc. Biol. Soc. Washington* **16**: 110 [*Cistothorus palustris iliacus*], 111 [*Campylorhynchus megalopterus nelsoni*], 167 [*Thryothorus pleurostictus ravus*], 168 [*Henicorhina leucophrys castanea, Henicorhina leucophrys bangsi*], 169 [*Cistothorus platensis lucidus*].
Ridgway (1904). *Smiths. Misc. Coll.* **47**: 112 [*Cinclocerthia ruficauda tenebrosa, Catharus fuscater sanctaemartae*], 113 [*Mimus gilvus tolimensis*].
Ridgway (1905). *Proc. Biol. Soc. Washington* **18**: 213 [*Catharus frantzii omiltemensis*].
Ridgway (1908). *Proc. Biol. Soc. Washington* **21**: 191 [*Thryorchilus browni basultoi*].
Riley (1918). *Proc. Biol. Soc. Washington* **31**: 158 [*Coracina abbotti, Cataponera turdoides abditiva*].
Riley (1933). *Proc. Biol. Soc. Washington* **46**: 155 [*Ixos mcclellandii canescens*].
Riley (1940). *Proc. Biol. Soc. Washington* **52**: 47 [*Pericrocotus solaris deignani*]; **53**: 131 [*Pericrocotus cinnamomeus sacerdos*], 133 [*Pycnonotus finlaysoni eous*].
Ripley (1946). *Spolia Zeylanica* **24**: 230 [*Acritillas indica guglielmi*].
Ripley (1952). *Condor* **54**: 362 [*Coracina ostenta*].
Ripley (1952). *J. Bombay Nat. Hist. Soc.* **50**: 486 [*Pericrocotus ethologus mariae*].
Ripley (1952). *Postilla* **13**: 31 [*Cercomela melanura neumanni*].
Ripley (1977). *Auk* **94**: 772-773 [*Turdus poliocephalus beehleri*].
Ripley & Hadden (1982). *J. Yamashina Inst. Orn.* **14**: 103-104 [*Zoothera talaseae atrigena*].
Ripley & Rabor (1961). *Postilla* **50**: 8 [*Pericrocotus flammeus gonzalesi*].
Ripley & Rabor (1962). *Postilla* **73**: 6 [*Brachypteryx montana sillimani*].
Roberts (1912). *J. S. Afr. Orn. Union* **8**: 21 [*Pogonocichla stellata transvaalensis*].
Roberts (1914). *Ann. Transvaal Mus.* **4**: 175 [*Pogonocichla stellata chirindensis*].
Roberts (1922). *Ann. Transvaal Mus.* **8**: 229 [*Campicoloides*], 232 [*Swynnertonia*].
Roberts (1931). *Ann. Transvaal Mus.* **14**: 242 [*Erythropygia signata tongensis*].
Roberts (1936). *Ostrich* **7**: 109 [*Turdus olivaceus transvaalensis*].
Roberts (1937). *Ostrich* **8**: 102 [*Cercomela tractrac barlowi*].
Robinson (1910). *Bull. Brit. Orn. Club* **25**: 99 [*Myophonus caeruleus crassirostris*].
Robinson (1915). *Ibis*: 746 [*Alophoixus ochraceus sacculatus*].
Robinson & Kloss (1916). *J. Str. Branch Roy. As. Soc.* **73**: 277 [*Turdus poliocephalus indrapurae*].
Robinson & Kloss (1918). *J. Fed. Malay States Mus.* **8**: 215 [*Myiomela diana sumatrana*], 222 [*Tephrodornis virgatus annectens*].
Robinson & Kloss (1919). *J. Nat. Hist. Soc. Siam* **3(2)**: 107 [*Chloropsis cyanopogon septentrionalis*].
Robinson & Kloss (1919). *Ibis*: 568 [*Ixos mcclellandii griseiventer*], 569 [*Pycnonotus flavescens sordidus*].
Robinson & Kloss (1920). *J. Str. Branch Roy. As. Soc.* **81**: 109 [*Tephrodornis virgatus fretensis*].
Robinson & Kloss (1922). *J. Fed. Malay States Mus.* **10**: 262 [*Copsychus malabaricus interpositus*].
Robinson & Kloss (1923). *J. Fed. Malay States Mus.* **11**: 55 [*Chloropsis hardwickii malayana*], 56 [*Enicurus velatus sumatranus*].
Robinson & Kloss (1923). *Bull. Brit. Orn. Club* **43**: 119 [*Pericrocotus ethologus annamensis*].
Robinson & Kloss (1924). *Ibis*: 48 [*Tricholestes criniger sericeus*].
Robinson-Dean, Willmott, Caterall, Kelly, Whittington, Phalan, Marples & Boeadi (2002). *Forktail* **18**: 3-6 [*Zoothera erythronota kabaena*].
de Roo (1967). *Rev. Zool. Bot. Afr.* **75**: 392 [*Chlorocichla prigoginei*].
van Rossem (1930). *Trans. San Diego Nat. Hist. Soc.* **6**: 207 [*Toxostoma curvirostre insularum*], 208 [*Thryothorus felix sonorae*], 225 [*Campylorhynchus brunneicapillus purus*].
van Rossem (1932). *Trans. San Diego Nat. Hist. Soc.* **7**: 138 [*Campylorhynchus brunneicapillus seri*].
van Rossem (1934). *Bull. Mus. Comp. Zool.* **77**: 399 [*Thryothorus pleurostictus oblitus*].
van Rossem (1942). *Trans. San Diego Nat. Hist. Soc.* **9**: 381 [*Toxostoma bendirei candidum, Toxostoma bendirei rubricatum*].
van Rossem (1943). *Condor* **45**: 235 [*Salpinctes obsoletus tenuirostris*].
van Rossem (1946). *Condor* **48**: 80 [*Toxostoma crissale coloradense*].
Rothschild (1893). *Avif. Laysan*: 67 [*Myadestes palmeri*].
Rothschild (1898). *Bull. Brit. Orn. Club* **7**: liii [*Nesomimus parvulus hulli*]; **8**: vii [*Nesomimus parvulus barringtoni*].
Rothschild (1899). *Bull. Brit. Orn. Club* **8**: 30 [*Zoothera dumasi*].
Rothschild (1900). *Bull. Brit. Orn. Club* **10**: 40 [*Lalage sharpei*].
Rothschild (1921). *Nov. Zool.* **28**: 51 [*Ixos mcclellandii similis*].
Rothschild (1922). *Bull. Brit. Orn. Club* **43**: 10 [*Tarsiger indicus yunnanensis*].
Rothschild (1931). *Nov. Zool.* **36**: 267 [*Coracina papuensis intermedia*].
Rothschild & Hartert (1902). *Nov. Zool.* **9**: 582 [*Coracina tenuirostris saturatior*].
Rothschild & Hartert (1903). *Nov. Zool.* **10**: 206 [*Coracina melas tommasonis*], 207 [*Coracina melas meeki*].
Rothschild & Hartert (1905). *Nov. Zool.* **12**: 264 [*Coracina lineata ombriosa*].

Rothschild & Hartert (1914). *Bull. Brit. Orn. Club* **33**: 107 [*Coracina ingens*, *Coracina tenuirostris rooki*], 108 [*Coracina tenuirostris admiralitatis*].
Rothschild & Hartert (1914). *Nov. Zool.* **21**: 5 [*Coracina schisticeps vittata*].
Rothschild & Hartert (1916). *Nov. Zool.* **23**: 289 [*Coracina welchmani kulambangrae*], 290 [*Coracina papuensis perpallida*].
Rothschild & Hartert (1917). *Bull. Brit. Orn. Club* **37**: 16 [*Lalage leucomela obscurior*], 17 [*Lalage leucomela keyensis*, *Lalage leucomela pallescens*].
Rothschild & Hartert (1921). *Bull. Brit. Orn. Club* **41**: 74 [*Zoothera joiceyi*].
Rothschild & Hartert (1924). *Bull. Brit. Orn. Club* **44**: 51 [*Lalage conjuncta*], 52 [*Zoothera heinei eichhorni*], 53 [*Turdus poliocephalus heinrothi*].
Rothschild & Hartert (1926). *Bull. Brit. Orn. Club* **46**: 53 [*Zoothera talaseae*].
Royle (1840). *Illus. Bot. Himalayan Mount.* **1**: 77-78 [*Turdus albocinctus*].
Rüppell (1837). *Neue Wirbelth. Vög.* **74**: pl. 25 [*Thamnolaea semirufa*], pl. 26 [*Thamnolaea cinnamomeiventris albiscapulata*]; **76**: pl. 26 [*Pinarochroa sordida*], pl. 27 [*Monticola rufocinereus*], 77 [*Myrmecocichla melaena*, *Oenanthe lugens lugubris*], 78 [*Pentholaea albifrons*].
Rüppell (1839). *Mus. Senckenb.* **3**: 25 [*Coracina melanoptera*], 28 [*Pteropodocys maxima*].
Rüppell (1840). *Neue Wirbelth. Vög.*: 81 [*Psophocichla litsitsirupa simensis*, *Cossypha semirufa*].
Rüppell (1845). *Syst. Uebers. Vög. N.-O. Afr.*: pl. 15 [*Erythropygia leucophrys leucoptera*], 39 [*Saxicola torquatus albofasciatus*].
Salaman, Coopmans, Donegan, Mulligan, Cortes, Hilty & Ortega (2003). *Orn. Colombiana* **1**: 6-9 [*Henicorhina negreti*].
Salomonsen (1934). *Nov. Zool.* **39**: 210 [*Saxicola torquatus ankaratrae*].
Salomonsen (1953). *Vidensk. Medd. Dan. Naturhist. Foren.* **115**: 227 [*Turdus poliocephalus katanglad*], 260 [*Saxicola caprata anderseni*].
Salomonsen (1964). *Biol. Skr. Dan. Vid. Selsk.* **14(1)**: 18-21 [*Lalage leucomela sumunae*].
Salvadori (1870). *Atti R. Accad. Sci. Torino* **5**: 509 [*Pycnonotus urostictus*].
Salvadori (1871). *Atti R. Accad. Sci. Torino* **6**: 128 [*Alophoixus finschii*].
Salvadori (1874). *Ann. Mus. Civ. Genova* **5**: 205 [*Tricholestes*]; **6**: 75 [*Coracina personata pollens*].
Salvadori (1876). *Ann. Mus. Civ. Genova* **7**: 925 [*Coracina lineata axillaris*], 927 [*Coracina tenuirostris muelleriï*].
Salvadori (1878). *Ann. Mus. Civ. Genova* **12**: 324 [*Coracina parvula*], 325 [*Coracina papuensis sclaterii*], 326 [*Coracina fortis*], 327 [*Coracina tenuirostris meyerii*], 328 [*Coracina dispar*], 329 [*Coracina tenuirostris obiensis*].
Salvadori (1879). *Ann. Mus. Civ. Genova* **14**: 205 [*Pericrocotus solaris montanus*], 206 [*Coracina larvata melanocephala*], 209 [*Hemipus picatus intermedius*], 225 [*Brachypteryx montana saturata*], 227 [*Myophonus melanurus*, *Myophonus caeruleus dichrorhynchus*], 228 [*Cochoa beccarii*]; **15**: 37 [*Coracina tenuirostris grayi*].
Salvadori (1880). *Ann. Mus. Civ. Genova* **15**: 38 [*Campochaera sloetii flaviceps*].
Salvadori (1886). *Ibis*: 154 [*Coracina striata guillemardi*].
Salvadori (1887). *Ann. Mus. Civ. Genova* **25**: 514 [*Turdus feae*], 515, 582 [*Pericrocotus solaris rubrolimbatus*], 549 [*Copsychus malabaricus melanurus*].
Salvadori (1890). *Agg. Orn. Pap. Mol.*: 91 [*Coracina tenuirostris nehrkorni*].
Salvadori (1891). *Boll. Mus. Zool. Anat. Comp. Univ. Torino* **16**: 2 [*Turdus olivaceofuscus xanthorhynchus*].
Salvadori (1892). *Ann. Mus. Civ. Genova* **Ser. 2, no. 12**: 129 [*Coracina striata enganensis*], 130 [*Pericrocotus flammeus modiglianii*], 135 [*Zoothera leucolaema*].
Salvadori & Festa (1899). *Bull. Mus. Zool. Anat. Comp. Univ. Torino* **14**: 4 [*Turdus chiguanco conradi*], 6 [*Thryothorus leucopogon*].
Salvin (1861). *Proc. Zool. Soc. London* **1861**: 202 [*Microcerculus philomela*].
Salvin (1865). *Proc. Zool. Soc. London* **1864**: 580 [*Thryothorus atrogularis*, *Thryothorus thoracicus*, *Myadestes melanops*, *Catharus gracilirostris*].
Salvin (1866). *Proc. Zool. Soc. London* **1866**: 68 [*Catharus aurantiirostris griseiceps*], 69 [*Microcerculus marginatus luscinia*].
Salvin (1867). *Ibis*: 121 [*Cinclus mexicanus ardesiacus*].
Salvin (1870). *Proc. Zool. Soc. London* **1870**: 181 [*Thryothorus semibadius*].
Salvin (1877). *Proc. Zool. Soc. London* **1877**: 367 [*Phainoptila*, *Phainoptila melanoxantha*].
Salvin (1881). *Ibis*: 130 [*Microcerculus marginatus taeniatus*].
Salvin (1885). *Ibis*: 197 [*Turdus ignobilis murinus*].
Salvin (1893). *Bull. Brit. Orn. Club* **1**: 32 [*Cyphorhinus phaeocephalus richardsoni*].
Salvin & Godman (1879). *Biol. Centr.-Amer., Aves* **1**: 3 [*Catharus frantzii alticola*].
Salvin & Godman (1880). *Biol. Centr.-Amer., Aves* **1**: 91 [*Thryothorus rutilus hyperythrus*], 92 [*Thryothorus rutilus hypospodius*].
Salvin & Godman (1882). *Ibis*: 76 [*Cichlopsis leucogenys gularis*].
Salvin & Godman (1883). *Ibis*: 204 [*Cistothorus platensis alticola*, *Microcerculus ustulatus*].
Salvin & Godman (1884). *Ibis*: 443 [*Turdus olivater roraimae*].
Salvin & Godman (1891). *Ibis*: 609 [*Campylorhynchus chiapensis*, *Salpinctes obsoletus guttatus*].
Sarasin, F. (1913). *Vög. Neu Caled. Loyalty Ins.*: 28 [*Lalage leucopyga simillima*].
Sassi (1914). *Anz. K. Akad. Wiss. Wien, Math.-Naturw. Kl.* **51**: 309 [*Phyllastrephus lorenzi*, *Zoothera camaronensis graueri*], 310 [*Zoothera oberlaenderi*], 311 [*Zoothera piaggiae tanganjicae*].
Say (1823). In: Long, *Exped. Rocky Mts.* **2**: 4 [*Salpinctes obsoletus*].
Schiebel (1910). *Orn. Jahrb.*: 182 [*Troglodytes troglodytes koenigi*].
Schlegel (1866). *Nederlandsch Tijdschrift Dierkunde* **3**: 253 [*Campochaera sloetii*].
Schlegel (1871). *Nederlandsch Tijdschrift Dierkunde* **4**: 44 [*Coracina caeruleogrisea strenua*], 45 [*Lalage atrovirens leucoptera*].
Schodde (1989). *Canberra Bird Notes* **13**: 121 [*Lalage leucomela macrura*].
Schodde & Mason (1999). *The Directory of Australian Birds*: 582 [*Coracina papuensis artamoides*].
Schouteden (1918). *Rev. Zool. Afr.* **5**: 294 [*Zoothera crossleyi pilettei*].
Schouteden (1937). *Rev. Bot. Afr.* **30**: 165 [*Cossypha caffra kivuensis*].
Sclater, P.L. (1855). *Proc. Zool. Soc. London* **1855**: 76 [*Thryothorus fasciatoventris albigularis*], 145 [*Microcerculus marginatus*].
Sclater, P.L. (1856). *Proc. Acad. Nat. Sci. Philadelphia* **8**: 263 [*Campylorhynchus rufinucha humilis*].
Sclater, P.L. (1856). *Ann. and Mag. Nat. Hist.* **Ser. 2, no. 17**: 468 [*Myadestes ralloides venezuelensis*].
Sclater, P.L. (1857). *Proc. Zool. Soc. London* **1856**: 290 [*Henicorhina leucosticta prostheleuca*], 299 [*Myadestes unicolor*].
Sclater, P.L. (1858). *Proc. Zool. Soc. London* **1857**: 271 [*Campylorhynchus nuchalis pardus*], 273 [*Turdus ignobilis*, *Turdus fulviventris*], 274 [*Cinclus leucocephalus leuconotus*], 275 [*Melanoptila*, *Melanoptila glabrirostris*]; **1858**: 64 [*Catharus dryas maculatus*], 67 [*Microcerculus bambla albigularis*], 297 [*Troglodytes brunneicollis*].
Sclater, P.L. (1859). *Proc. Zool. Soc. London* **1858**: 447 [*Turdus albicollis leucauchen*], 550 [*Troglodytes solstitialis*]; **1859**: 113 [*Zoothera erythronota*], 323 [*Catharus occidentalis*], 334 [*Ridgwayia pinicola*], 335 [*Margarops*].
Sclater, P.L. (1860). *Proc. Zool. Soc. London* **1859**: 371 [*Campylorhynchus jocosus*, *Thryothorus felix*]; **1860**: 64 [*Thryothorus mystacalis*], 74 [*Thryothorus euophrys*], 84 [*Thryothorus nigricapillus*], 291 [*Cyphorhinus phaeocephalus*].
Sclater, P.L. (1860). *Ibis*: 30 [*Thryothorus pleurostictus*].
Sclater, P.L. (1861). *Ibis*: 280 [*Turdus poliocephalus schlegelii*].
Sclater, P.L. (1861). *Proc. Zool. Soc. London* **1860**: 462 [*Campylorhynchus gularis*]; **1861**: 185 [*Copsychus malabaricus suavis*], 186 [*Copsychus saularis ceylonensis*].
Sclater, P.L. (1862). *Proc. Zool. Soc. London* **1862**: 18 [*Toxostoma ocellatum*].
Sclater, P.L. (1862). *Cat. Am. Birds*: 19 [*Microcerculus*], 22 [*Thryomanes*].
Sclater, P.L. (1863). *Ibis*: 196 [*Turdus hortulorum*].
Sclater, P.L. (1866). *Proc. Zool. Soc. London* **1866**: 320 [*Cinclocerthia gutturalis macrorhyncha*].
Sclater, P.L. (1870). *Proc. Zool. Soc. London* **1869**: 592 [*Thryothorus pleurostictus nisorius*]; **1870**: 328 [*Thryothorus leucotis rufiventris*].
Sclater, P.L. (1874). *Proc. Zool. Soc. London* **1873**: 781 [*Cinnycerthia fulva*].
Sclater, P.L. (1876). *Proc. Zool. Soc. London* **1876**: 14 [*Troglodytes musculus mesoleucus*].
Sclater, P.L. (1879). *Proc. Zool. Soc. London* **1879**: 448 [*Coracina lineata sublineata*].
Sclater, P.L. (1880). *Ibis*: 73 [*Cichlherminia lherminieri sanctaeluciae*].
Sclater, P.L. (1880). *Proc. Zool. Soc. London* **1880**: 66 [*Saxicola caprata aethiops*].
Sclater, P.L. (1883). *Proc. Zool. Soc. London* **1883**: 55 [*Coracina personata unimodus*, *Lalage atrovirens moesta*].
Sclater, P.L. (1889). *Proc. Zool. Soc. London* **1889**: 326 [*Turdus plumbeus albiventris*].
Sclater, P.L. & Moreau (1935). *Bull. Brit. Orn. Club* **56**: 13 [*Turdus olivaceus oldeani*].
Sclater, P.L. & Salvin (1859). *Ibis* **1**: 8 [*Cistothorus platensis elegans*].
Sclater, P.L. & Salvin (1868). *Proc. Zool. Soc. London* **1868**: 170 [*Henicorhina*].
Sclater, P.L. & Salvin (1873). *Nomencl. Avium Neotrop.*: 155 [*Uropsila*].
Sclater, P.L. & Salvin (1875). *Proc. Zool. Soc. London* **1875**: 37 [*Microcerculus marginatus squamulatus*].
Sclater, P.L. & Salvin (1876). *Proc. Zool. Soc. London* **1875**: 541 [*Catharus aurantiirostris phaeopleurus*]; **1876**: 352 [*Catharus fuscater mentalis*].
Sclater, P.L. & Salvin (1879). *Proc. Zool. Soc. London* **1879**: 492 [*Cyphorhinus thoracicus dichrous*].
Sclater, W.L. (1899). *Ibis*: 284 [*Phyllastrephus debilis*].
Sclater, W.L. (1911). *Ibis*: 415 [*Cossypha caffra namaquensis*].
Sclater, W.L. (1927). *Bull. Brit. Orn. Club* **47**: 86 [*Pseudalethe choloensis*].
Sclater, W.L. (1928). *Bull. Brit. Orn. Club* **49**: 14 [*Cercomela schlegelii benguellensis*], 15 [*Cercomela schlegelii namaquensis*].
Scopoli (1769). *Annus I Hist. -Nat.*: 131 [*Prunella collaris*].
Scopoli (1786). *Deliciae Florae Faunae Insubricae* **2**: 88 [*Myophonus caeruleus*], 96 [*Pycnonotus goiavier*, *Copsychus malabaricus*].
Scott, W.E.D. (1888). *Auk* **5**: 188 [*Cistothorus palustris marianae*].
Seebohm (1881). *Cat. Birds Brit. Mus.* **5**: 158 [*Zoothera heinei papuensis*], 161 [*Zoothera dixoni*], 231 [*Turdus pelios chiguancoides*], 251 [*Turdus simillimus bourdilloni*], 289 [*Catharus aurantiirostris birchalli*], 371 [*Oenanthe lugens lugentoides*], 372 [*Oenanthe lugens persica*], 404 [*Turdus albicollis phaeopygoides*], 405 [*Turdus maximus*].
Seebohm (1884). *Zoologist*: 333 [*Troglodytes troglodytes hirtensis*].
Seebohm (1887). *Proc. Zool. Soc. London* **1887**: 557 [*Turdus nigriceps subalaris*].
Seebohm (1890). *Proc. Zool. Soc. London* **1890**: 342 [*Hemixos castanonotus canipennis*].
Seebohm (1891). *Proc. Zool. Soc. London* **1890**: 667 [*Turdus poliocephalus layardi*].
Seebohm (1893). *Bull. Brit. Orn. Club* **1**: 25 [*Turdus poliocephalus whiteheadi*].
Seebohm (1894). *Bull. Brit. Orn. Club* **3**: 51 [*Turdus poliocephalus thomassoni*].
Sennett (1890). *Auk* **7**: 58 [*Thryothorus ludovicianus lomitensis*].
Serebrovski (1927). *Compt. Rend. Acad. Sci. URSS*: 326 [*Cinclus cinclus uralensis*].
Serle (1949). *Bull. Brit. Orn. Club* **69**: 53 [*Sheppardia bocagei granti*].
Severtsov (1873). *Izvest. Imp. Obsch. Liubit. Estestv. Antrop. Etnogr. Moskva* **8(2)**: 132 [*Prunella fulvescens*].
Severtsov (1873). *Vert. Turkest. Zhivotn.*: 120 [*Luscinia megarhynchos hafizi*], 122 [*Luscinia pectoralis ballioni*].
Severtsov (1879). *Izvest. Imp. Obsch. Liubit. Estestv. Antrop. Etnogr. Turkest. Otd.* **1(1)**: 45 [*Prunella collaris rufilata*].
Sharpe (1870). *Ibis*: 53 [*Stizorhina finschi*].
Sharpe (1871). *Proc. Zool. Soc. London* **1871**: 132 [*Pycnonotus barbatus gabonensis*], 607 [*Zoothera crossleyi*].
Sharpe (1871). *Cat. Afr. Birds*: 21 [*Criniger calurus verreauxi*].
Sharpe (1874). *Proc. Zool. Soc. London* **1873**: 625 [*Zoothera princei*].
Sharpe (1876). *Trans. Linn. Soc. London (2nd Ser.)* **1**: 333 [*Chloropsis palawanensis*].
Sharpe (1876). In: Layard, *Birds S. Afr.*: 205 [*Andropadus importunus hypoxanthus*], 230 [*Pinarornis*, *Pinarornis plumosus*].
Sharpe (1876). *Ibis*: 53 [*Phyllastrephus flavostriatus*].
Sharpe (1877). *Ibis*: 15 [*Chloropsis cochinchinensis viridinucha*].
Sharpe (1877). *Trans. Linn. Soc. London* **1**: 334 [*Alophoixus bres frater*], 335 [*Ixos rufigularis*, *Copsychus niger*].
Sharpe (1877). *Cat. Birds Brit. Mus.* **3**: 266 [*Irena cyanogastra melanochlamys*], 267 [*Irena puella crinigera*], 268 [*Irena puella tweeddalei*].
Sharpe (1878). *Ibis*: 418 [*Pycnonotus cyaniventris paroticalis*].
Sharpe (1878). *Cat. Birds Brit. Mus.* **4**: 9 [*Coracina schistacea*].
Sharpe (1878). *Mitt. Zool. Mus. Dresden* **1(3)**: 363 [*Coracina personata floris*, *Campochaera*], 364 [*Coracina boyeri subalaris*], 367 [*Coracina morio salvadorii*], 369 [*Coracina tenuirostris timoriensis*, *Coracina tenuirostris aruensis*, *Coracina tenuirostris remota*], 370 [*Coracina polioptera*], 371 [*Lalage maculosa whitmeei*].
Sharpe (1878). *J. Linn. Soc. London, Zool.* **13**: 81 [*Coracina papuensis angustifrons*].
Sharpe (1879). *Proc. Zool. Soc. London* **1879**: 247 [*Pycnonotus montis*], 248 [*Alophoixus ochraceus ruficrissus*].
Sharpe (1882). *Cat. Birds Brit. Mus.* **6**: 3, 112 [*Chlorocichla*], 15 [*Aegithina lafresnayei xanthotis*], 83 [*Phyllastrephus cabanisi*], 103 [*Phyllastrephus albigularis*], 113 [*Chlorocichla flaviventris occidentalis*], 184 [*Cinnycerthia olivascens*], 186, 196 [*Campylorhynchus brunneicapillus couesi*], 217 [*Thryothorus nigricapillus costaricensis*], 230 [*Thryothorus fasciatoventris melanogaster*], 235 [*Thryothorus coraya amazonicus*], 236 [*Thryothorus coraya griseipectus*], 238 [*Thryothorus sclateri paucimaculatus*], 261 [*Troglodytes solstitialis frater*], 262 [*Troglodytes rufociliatus*], 273 [*Troglodytes troglodytes tianschanicus*], 292 [*Cyphorhinus arada salvini*].
Sharpe (1882). *J. Linn. Soc. London, Zool.* **16**: 318 [*Coracina schisticeps poliopsa*].
Sharpe (1882). *Proc. Zool. Soc. London* **1882**: 588 [*Erythropygia leucophrys zambesiana*].
Sharpe (1883). *Cat. Birds Brit. Mus.* **7**: 44 [*Erythropygia leucosticta*], 174 [*Stiphrornis erythrothorax gabonensis*].
Sharpe (1887). *Ibis*: 438 [*Coracina larvata normani*], 439 [*Chlamydochaera*, *Chlamydochaera jefferyi*], 445-446 [*Chloropsis kinabaluensis*], 446 [*Hemixos cinereus connectens*].
Sharpe (1887). *Proc. Zool. Soc. London* **1887**: 435 [*Coracina macei larutensis*], 515 [*Turdus poliocephalus erythropleurus*].
Sharpe (1888). *Proc. Zool. Soc. London* **1888**: 184 [*Coracina tenuirostris erythropygia*, *Coracina holopolia*].
Sharpe (1888). *Ibis*: 386 [*Turdus poliocephalus seebohmi*], 388 [*Pycnonotus flavescens leucops*], 389 [*Brachypteryx montana erythrogyna*], 478 [*Zoothera citrina aurata*].
Sharpe (1889). *Ibis*: 192 [*Pericrocotus solaris cinereigula*], 277 [*Enicurus leschenaulti borneensis*].
Sharpe (1891). *Ibis*: 118 [*Andropadus nigriceps kikuyuensis*], 121 [*Coracina caesia pura*], 445 [*Myrmecocichla aethiops cryptoleuca*].
Sharpe (1892). *Ibis*: 323 [*Zoothera everetti*].
Sharpe (1893). *Bull. Brit. Orn. Club* **3**: 10 [*Coracina mindanensis everetti*].
Sharpe (1895). *Bull. Brit. Orn. Club* **4**: 28 [*Cossypha semirufa donaldsoni*].
Sharpe (1895). *Proc. Zool. Soc. London* **1895**: 488 [*Pycnonotus barbatus dodsoni*].
Sharpe (1899). *Bull. Brit. Orn. Club* **10**: 27 [*Chlorocichla laetissima*].
Sharpe (1900). *Bull. Brit. Orn. Club* **10**: 36 [*Pinarochroa sordida ernesti*]; **11**: 28 [*Cossypha albicapillum omoensis*], 29 [*Andropadus masukuensis kakamegae*].
Sharpe (1901). *Bull. Brit. Orn. Club* **11**: 67 [*Pogonocichla stellata intensa*]; **12**: 4 [*Sheppardia cyornithopsis*], 28 [*Turdus iliacus coburni*], 35 [*Cichladusa guttata rufipennis*].
Sharpe (1902). *Bull. Brit. Orn. Club* **12**: 55 [*Heteroxenicus*]; **13**: 9 [*Cossypha archeri*], 10 [*Pseudalethe poliophrys*], 11 [*Troglodytes troglodytes talifuensis*].
Sharpe (1902). In: Seebohm, *Monogr. Turdidae* **2**: 83 [*Turdus flavipes venezuelensis*], 85 [*Turdus flavipes polionota*], 87 [*Turdus flavipes melanopleura*], 215 [*Turdus plumbeus coryi*].
Sharpe (1903). *Bull. Brit. Orn. Club* **14**: 19 [*Turdus olivaceus baraka*, *Stiphrornis erythrothorax xanthogaster*].
Sharpe (1905). *Ibis*: 472 [*Zoothera camaronensis*].
Sharpe (1905). *Bull. Brit. Orn. Club* **16**: 36 [*Zoothera princei batesi*].
Shelley (1885). *Proc. Zool. Soc. London* **1884**: 226 [*Pinarochroa sordida hypospodia*], 556 [*Saxicola torquatus axillaris*].
Shelley (1885). *Ibis*: 404 [*Oenanthe phillipsi*].
Shelley (1889). *Proc. Zool. Soc. London* **1889**: 362 [*Andropadus nigriceps*], 363 [*Phyllastrephus cabanisi placidus*].
Shelley (1890). *Ibis*: 159 [*Cossypha cyanocampter bartteloti*].

Shelley (1893). *Ibis*: 12 [*Turdus olivaceus milanjensis*], 13 [*Andropadus nigriceps fusciceps*], 14 [*Cossypha anomala*].
Shelley (1894). *Ibis*: 9 [*Andropadus milanjensis*], 10 [*Andropadus virens zombensis, Phyllastrephus cerviniventris*].
Shelley (1896). *Ibis*: 179 [*Andropadus milanjensis olivaceiceps*].
Shelley (1897). *Ibis*: 534 [*Andropadus masukuensis*].
Shelley (1903). *Bull. Brit. Orn. Club* **13**: 60 [*Sheppardia sharpei*], 61 [*Phyllastrephus flavostriatus alfredi, Cossypha anomala macclounii*].
Shelley (1906). *Bull. Brit. Orn. Club* **16**: 125 [*Swynnertonia swynnertoni*].
Shulpin (1928). *Ann. Mus. Zool. Acad. Sci. USSR* **27**: 404 [*Luscinia cyane bochaiensis*].
Sibley (1946). *Condor* **48**: 182 [*Coracina tenuirostris matthiae*].
Siebers (1928). *Treubia* **10**: 396 [*Pycnonotus bimaculatus snouckaerti*].
Siebold (1824). *Hist. Nat. Jap.*: 13 [*Bombycilla japonica*].
Sjöstedt (1893). *Orn. Monatsber.* **1**: 28 [*Baeopogon clamans*].
Slater (1885). *Ibis*: 124 [*Myophonus borneensis*].
Smith, A. (1834). *S. Afr. Quart. J. (Ser. 2)* **2**: 143 [*Chlorocichla flaviventris*].
Smith, A. (1836). *Rep. Exped. Central Africa*: 45 [*Turdus libonyanus, Psophocichla litsitsirupa*], 46 [*Cossypha humeralis, Erythropygia, Erythropygia paena*].
Smith, A. (1840). *Zool. S. Afr.*: pl. 60 [*Cossypha natalensis*].
van Someren (1915). *Bull. Brit. Orn. Club* **35**: 116 [*Bleda notatus ugandae*], 127 [*Andropadus gracilis ugandae*].
van Someren (1920). *Bull. Brit. Orn. Club* **40**: 91 [*Cercomela scotocerca turkana*], 95 [*Andropadus ansorgei kavirondensis*].
van Someren (1921). *Bull. Brit. Orn. Club* **41**: 125 [*Sheppardia gunningi sokokensis*].
van Someren (1931). *J. East Afr. Uganda Nat. Hist. Soc.*: 195 [*Zoothera gurneyi chuka*].
van Someren (1939). *J. East Afr. Uganda Nat. Hist. Soc.*: 83 [*Pogonocichla stellata macarthuri*].
Sousa (1888). *J. Sci. Math. Phys. e Nat., Acad. Real Sci., Lisboa* **12**: 225, 233 [*Monticola angolensis*].
Spix (1824). *Av. Bras.* **1**: 70 [*Turdus leucomelas albiventer*], 77 [*Campylorhynchus*].
Statius Muller (1776). *Natursyst.* (Suppl.): 139 [*Hypsipetes madagascariensis*], 145 [*Monticola solitarius philippensis, Cercotrichas podobe*], 170 [*Margarops fuscus*], 171 [*Coracina cinerea*].
Statius Muller (1836). *Tijdschr. Natuurl. Gesch. Phys.* **2**: 352 [*Pycnonotus leucogrammicus*], 353 [*Pycnonotus tympanistrigus*].
Statius Muller (1844). *Verh. nat. gesch. Ned., Land-en Volkenk*: 201 [*Turdus poliocephalus fumidus*].
Steere (1890). *List Birds Mammals Steere Exped.*: 14 [*Coracina striata mindorensis, Coracina striata panayensis*], 15 [*Lalage melanoleuca minor, Pericrocotus flammeus leytensis*], 18 [*Irena cyanogastra ellae*], 19 [*Pycnonotus urostictus basilanicus, Ixos philippinus mindorensis, Ixos philippinus guimarasensis, Ixos siquijorensis*], 20 [*Copsychus cebuensis*].
Stegmann (1935). *Doklady Akad. Nauk. S.S.R., New Ser.* **3**: 47 [*Saxicola torquatus armenicus*].
Stejneger (1882). *Proc. US Natl. Mus.* **4**: 371, 373 [*Myadestes occidentalis insularis*], 371-372 [*Myadestes occidentalis*]; **5**: 20 [*Myadestes genibarbis sanctaeluciae*], 22 [*Myadestes genibarbis dominicanus*].
Stejneger (1883). *Proc. US Natl. Mus.* **5**: 456 [*Entomodestes*], 460 [*Ridgwayia*].
Stejneger (1886). *Proc. US Natl. Mus.* **9**: 644 [*Luscinia komadori namiyei*].
Stejneger (1887). *Science* **10**: 108 [*Turdus celaenops*].
Stejneger (1887). *Proc. US Natl. Mus.* **9**: 642 [*Microscelis amaurotis pryeri*], 648 [*Pericrocotus divaricatus tegimae*]; **10**: 90 [*Myadestes myadestinus*].
Stejneger (1889). *Proc. US Natl. Mus.* **11**: 548 [*Troglodytes troglodytes kurilensis*].
Stenhouse (1924). *Scot. Nat.*: 95 [*Nesocichla eremita gordoni*].
Stephens (1817). In: Shaw, *Gen. Zool.* **10(1)**: 182 [*Catharus fuscescens*].
Stevenson (1973). *Auk* **90**: 36 [*Thryothorus ludovicianus nesophilus*].
Stiles & Caycedo (2002). *Caldasia* **24**: 192-193 [*Cistothorus apolinari hernandezi*].
Stoliczka (1872). *J. Asiatic Soc. Bengal* **41**: 238 [*Saxicola macrorhynchus*].
Stone (1899). *Proc. Acad. Nat. Sci. Philadelphia* **51**: 308 [*Troglodytes musculus columbae*].
Stone (1931). *Proc. Acad. Nat. Sci. Philadelphia* **83**: 2 [*Catharus frantzii juancitonis*].
Stone (1932). *Proc. Acad. Nat. Sci. Philadelphia* **84**: 328 [*Troglodytes rufociliatus rehni*].
Stresemann (1912). *Nov. Zool.* **19**: 321 [*Saxicola caprata albonotatus*], 342 [*Thapsinillas longirostris harterti*].
Stresemann (1912). *Bull. Brit. Orn. Club* **31**: 4 [*Turdus poliocephalus deningeri*].
Stresemann (1922). *Orn. Monatsber.* **30**: 7 [*Coracina tenuirostris heinrothi*].
Stresemann (1923). *J. Orn.* **71**: 363 [*Chloropsis hardwickii melliana, Pericrocotus brevirostris anthoides*], 365 [*Zoothera citrina melli*].
Stresemann (1931). *Orn. Monatsber.* **39**: 9 [*Heinrichia, Heinrichia calligyna*], 10 [*Geomalia*], 11 [*Geomalia heinrichi*], 44 [*Turdus poliocephalus hygroscopus*], 81 [*Heinrichia calligyna simplex*], 82 [*Geomalia heinrichi matinangensis*].
Stresemann (1932). *Orn. Monatsber.* **40**: 108 [*Heinrichia calligyna picta*], 109 [*Coracina tenuirostris edithae*].
Stresemann (1933). *Orn. Monatsber.* **41**: 114 [*Lalage leucomela ottomeyeri*].
Stresemann (1938). *Temminckia* **3**: 128 [*Pycnonotus plumosus hutzi*].
Stresemann (1938). *Orn. Monatsber.* **46**: 46 [*Cataponera turdoides tenebrosa, Cataponera turdoides heinrichi*].
Stresemann (1940). *Mitt. Zool. Mus. Berlin* **24**: 153 [*Ixos mcclellandii ventralis*].
Stresemann & Paludan (1932). *Orn. Monatsber.* **40**: 17 [*Coracina melas waigeuensis*].
Strickland (1844). *Ann. and Mag. Nat. Hist.* **Ser. 1, no. 13**: 36 [*Coracina melanoptera sykesi*], 411 [*Pycnonotus finlaysoni, Acritillas indica icterica*].
Strickland (1844). *Proc. Zool. Soc. London* **1844**: 100 [*Andropadus latirostris, Neocossyphus poensis*], 101 [*Andropadus gracilirostris, Stizorhina fraseri*].
Strickland (1853). In: Jardine, *Contr. Orn*: 147 [*Cercomela familiaris galtoni*].
Stuart Baker (1913). *Bull. Brit. Orn. Club* **31**: 79 [*Zoothera mollissima whiteheadi*].
Stuart Baker (1915). *Bull. Brit. Orn. Club* **35**: 61 [*Prunella collaris whymperi*].
Stuart Baker (1916). *Nov. Zool.* **23**: 298 [*Luscinia brunnea wickhami*].
Stuart Baker (1917). *Bull. Brit. Orn. Club* **38**: 15 [*Hypsipetes leucocephalus nigrescens*], 16 [*Pycnonotus flavescens vividus, Iole propinqua cinnamomeoventris*].
Stuart Baker (1918). *Bull. Brit. Orn. Club* **38**: 69 [*Coracina macei siamensis*].
Stuart Baker (1920). *Bull. Brit. Orn. Club* **40**: 114 [*Pericrocotus cinnamomeus vividus*], 115 [*Pericrocotus cinnamomeus pallidus, Pericrocotus cinnamomeus saturatus*].
Stuart Baker (1922). *Bull. Brit. Orn. Club* **43**: 18 [*Hodgsonius phaenicuroides ichangensis*], 19 [*Saxicola caprata burmanicus, Enicurus maculatus robinsoni*].
Stuart Baker (1922). *Fauna Brit. India, Birds* **1**: 342 [*Aegithina tiphia humei*].
Stuart Baker (1924). *Fauna Brit. India, Birds* **2**: 327 [*Pericrocotus ethologus ripponi*].
Styan (1893). *Ibis*: 470 [*Pycnonotus taivanus*].
Sundevall (1850). *Oefv. Kongl. Vet.-Akad. Forh.* **7**: 101 [*Erythropygia signata*].
Sundevall (1858). *Kungl. Svenska Vet.-Akad. nya Handl.* **2(3)**: 44 [*Cercomela sinuata*].
Sundevall (1872). *Methodi Naturalis Avium Disponendarum Tentamen*: 4 [*Pinarochroa*].
Sushkin (1925). *Proc. Boston Soc. Nat. Hist.* **38**: 51 [*Prunella fulvescens nanschanica*], 52 [*Prunella fulvescens mongolica*], 54 [*Prunella fulvescens khamensis*].
Sushkin (1925). *List Distr. Birds Russian Altai*: 77 [*Luscinia svecica saturatior*].
Swainson (1825). *Zool. J.* **1**: 466 [*Coracina lineata*], 467 [*Lalage tricolor*].
Swainson (1827). *Philos. Mag. (New Ser.)* **1**: 368 [*Ptilogonys, Ptilogonys cinereus, Cinclus mexicanus*], 369 [*Melanotis caerulescens, Toxostoma curvirostre, Sialia*].
Swainson (1829). *Zool. Illustr. (2nd Ser.)* **1**: pl. 11 [*Catherpes mexicanus*].
Swainson (1831). In: Swainson & Richardson, *Fauna Bor.-Amer.*: 485 [*Andropadus*], 486 [*Phyllastrephus*].
Swainson (1832). *Zool. Illustr. (2nd Ser.)* **2**: pl. 72 [*Donacobius*].
Swainson (1832). *Fauna Bor.-Amer.* **2**: 187 [*Ixoreus naevius meruloides*], 202 [*Sialia mexicana*], 482 [*Tephrodornis*].
Swainson (1837). *Birds W. Afr.* **1**: 259 [*Chlorocichla flavicollis*], 261 [*Bleda syndactylus*], 264 [*Criniger olivaceus*], 270 [*Pyrrhurus scandens, Phyllastrephus terrestris*]; **2**: 46 [*Pentholaea albifrons frontalis*].
Swainson (1838). *Anim. in Menag.*: 285 [*Phainopepla nitens*], 322 [*Thryothorus genibarbis*], 325 [*Campylorhynchus griseus*], 351 [*Campylorhynchus fasciatus*].
Swainson (1838). *Nat. Libr. Flycatchers*: 132 [*Myadestes*], 134 [*Myadestes genibarbis*].
Swarth (1917). *Auk* **34**: 310 [*Cistothorus palustris aestuarinus*].
Swarth (1931). *Occas. Pap. Calif. Acad. Sci.* **18**: 129 [*Nesomimus parvulus wenmani*].
Swinhoe (1861). *Ibis*: 42 [*Pericrocotus cantonensis*], 266 [*Spizixos semitorques, Ixos mcclellandii holtii*].
Swinhoe (1863). *Ibis*: 93 [*Monticola gularis*], 265 [*Coracina macei rexpineti*].
Swinhoe (1863). *Proc. Zool. Soc. London* **1863**: 292 [*Luscinia sibilans*].
Swinhoe (1864). *Ibis*: 362-363 [*Myiomela leucura montium*].
Swinhoe (1870). *Ibis*: 242 [*Coracina melaschistos saturata*], 244 [*Pericrocotus flammeus fraterculus, Copsychus malabaricus minor*], 251 [*Hemixos castanonotus, Hypsipetes leucocephalus perniger*], 252 [*Alophoixus pallidus*], 253 [*Pycnonotus sinensis hainanus*], 255 [*Chloropsis hardwickii lazulina*].
Swinhoe (1870). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 5**: 175 [*Pycnonotus xanthorrhous andersoni*].
Swinhoe (1870). *Proc. Zool. Soc. London* **1870**: 124 [*Prunella collaris erythropygia*].
Swinhoe (1871). *Proc. Zool. Soc. London* **1871**: 370 [*Spizixos semitorques cinereicapillus*].
Sykes (1832). *Proc. Zool. Soc. London* **1832**: 85 [*Hemipus picatus*], 86 [*Hypsipetes ganeesa*], 87 [*Monticola solitarius pandoo*], 92 [*Saxicola caprata bicolor*].
Taczanowski (1874). *J. Orn.* **22**: 320 [*Prunella fulvescens dahurica*].
Taczanowski (1874). *Proc. Zool. Soc. London* **1874**: 130 [*Cistothorus platensis graminicola, Thryothorus coraya cantator*].
Taczanowski (1877). *Proc. Zool. Soc. London* **1877**: 331 [*Turdus leucops*].
Taczanowski (1879). *Proc. Zool. Soc. London* **1879**: 22 [*Thryothorus sclateri*].
Taczanowski (1880). *Proc. Zool. Soc. London* **1880**: 189 [*Turdus maranonicus*].
Taczanowski (1882). *Proc. Zool. Soc. London* **1882**: 5 [*Thryothorus coraya albiventris*].
Taczanowski & Berlepsch (1885). *Proc. Zool. Soc. London* **1885**: 72 [*Odontorchilus branickii*].
Temminck (1820). *Man. d'Orn.* **2(1)**: lx [*Criniger*], 170 [*Turdus naumanni*], 177 [*Cinclus pallasii*], 182 [*Erythropygia galactotes*].
Temminck (1821). *Planches Color* **livr. 15**: pl. 88 [*Criniger barbatus*].
Temminck (1822). *Planches Color* **livr. 19**: pl. 113; **livr. 20**: pl. 119 [*Hemipus hirundinaceus*]; **livr. 25**: pl. 147 [*Pycnonotus atriceps*]; **livr. 26**: pl. 156 [*Pericrocotus miniatus*]; **livr. 27**: pl. 160 [*Enicurus velatus*]; **livr. 29**: pl. 170 [*Myophonus*].
Temminck (1823). *Planches Color* **livr. 33**: pl. 194 [*Myophonus glaucinus*].
Temminck (1824). *Planches Color* **livr. 42**: pl. 249 [*Coracina fimbriata*]; **livr. 43**: pl. 256 [*Tephrodornis virgatus*], pl. 257 [*Cercomela melanura*]; **livr. 46**: pl. 274 [*Cochoa azurea*]; **livr. 47**: pl. 278 [*Coracina bicolor*], pls. 279-280 [*Lobotos lobatus*].
Temminck (1825). *Planches Color* **livr. 60**: pl. 359 [*Oenanthe monacha, Oenanthe deserti*]; **livr. 64**: pl. 382 [*Ixos, Ixos virescens, Lalage aurea*].
Temminck (1826). *Planches Color* **livr. 66**: pl. 392 [*Zoothera andromedae*].
Temminck (1828). *Planches Color* **livr. 76**: pl. 448 [*Brachypteryx leucophrys*], pl. 453 [*Pycnonotus squamatus*]; **livr. 78**: pl. 458 [*Zoothera interpres*].
Temminck (1829). *Planches Color* **livr. 79**: pl. 472 [*Campicoloides bifasciatus, Oenanthe isabellina*]; **livr. 81**: pl. 484 [*Chloropsis cyanopogon*].
Temminck (1830). *Planches Color* **livr. 84**: pl. 497 [*Microscelis amaurotis*]; **livr. 86**: pl. 512 [*Chloropsis cyanopogon*].
Temminck (1831). *Planches Color* **livr. 87**: pl. 514 [*Turdus eunomus*], 518 [*Turdus cardis*].
Temminck (1832). *Planches Color* **livr. 87**: pl. 537 [*Turdus chrysolaus*]; **livr. 90**: 534 [*Enicurus ruficapillus*].
Temminck (1835). *Planches Color* **livr. 96**: 570 [*Luscinia komadori*], 571 [*Luscinia akahige*].
Temminck (1835). *Man. d'Orn.* **3**: 161 [*Troglodytes troglodytes fumigatus*].
Temminck & Schlegel (1848). In: Siebold, *Fauna Jap., Aves*: 69 [*Prunella rubida*].
Thesiger & Meynell (1934). *Bull. Brit. Orn. Club* **55**: 79 [*Cercomela melanura aussae*].
Ticehurst (1918). *J. Bombay Nat. Hist. Soc.* **26**: 279 [*Pycnonotus leucotis mesopotamia*].
Ticehurst (1920). *Bull. Brit. Orn. Club* **41**: 56 [*Tephrodornis pondicerianus pallidus*].
Ticehurst (1922). *Bull. Brit. Orn. Club* **42**: 121 [*Tarsiger chrysaeus whistleri*].
Ticehurst (1932). *Bull. Brit. Orn. Club* **53**: 19 [*Alophoixus pallidus robinsoni*].
Tickell (1833). *J. Asiatic Soc. Bengal* **2**: 573 [*Pycnonotus flaviventris*], 577 [*Turdus unicolor*].
Todd (1912). *Ann. Carnegie Mus.* **8**: 206 [*Troglodytes solstitialis solitarius*].
Todd (1913). *Proc. Biol. Soc. Washington* **26**: 170 [*Thryothorus genibarbis bolivianus, Turdus olivater sanctaemartae*].
Todd (1919). *Proc. Biol. Soc. Washington* **32**: 114 [*Cyphorhinus phaeocephalus propinquus*].
Todd (1925). *Proc. Biol. Soc. Washington* **38**: 91 [*Thryothorus griseus*].
Todd (1931). *Proc. Biol. Soc. Washington* **44**: 54 [*Turdus nudigenis extimus, Turdus haplochrous*].
Todd (1932). *Proc. Biol. Soc. Washington* **45**: 9 [*Thryothorus rutilus interior*], 10 [*Thryothorus rutilus intensus, Henicorhina leucophrys boliviana*], 11 [*Henicorhina leucophrys meridana*], 13 [*Cyphorhinus arada transfluvialis, Cyphorhinus arada interpositus*].
Townsend, C.H. (1890). *Proc. US Natl. Mus.* **13**: 133 [*Troglodytes tanneri*].
Townsend, J.K. (1837). *J. Acad. Nat. Sci. Philadelphia* **7**: 188 [*Sialia mexicana occidentalis*], 192 [*Oreoscoptes montanus*].
Traylor (1948). *Fieldiana Zool.* **31**: 196 [*Donacobius atricapilla nigrodorsalis*].
Traylor (1961). *Bull. Brit. Orn. Club* **81(3)**: 43 [*Oenanthe monticola nigricauda*], 44 [*Pseudalethe poliocephala hallae*].
Tristram (1859). *Ibis*: 59 [*Oenanthe lugens halophila, Oenanthe deserti homochroa*].
Tristram (1868). *Proc. Zool. Soc. London* **1867**: 888 [*Oenanthe pileata livingstonii*].
Tristram (1869). *Ibis*: 206 [*Pentholaea arnotti, Oenanthe monticola atmorii*].
Tristram (1870). *Ibis*: 497 [*Cinclus cinclus minor*].
Tristram (1879). *Ibis*: 188 [*Turdus poliocephalus samoensis*], 190 [*Coracina caledonica lifuensis*], 440 [*Coracina salomonis, Lalage leucopyga affinis*].
Tristram (1884). *Surv. W. Palestine Faun. Flor.*: 51 [*Cinclus cinclus rufiventris*].
Tristram (1892). *Ibis*: 294 [*Coracina welchmani, Coracina lineata nigrifrons*].
Tschudi (1844). *Archiv Naturgeschichte* **10**: 270 [*Entomodestes leucotis*], 279 [*Cinclus leucocephalus*], 280 [*Mimus longicaudatus, Turdus serranus*], 282 [*Troglodytes musculus audax, Henicorhina leucophrys, Cyphorhinus thoracicus*].
Tschudi (1845). *Fauna Peruana*: 28 [*Catharus ustulatus swainsoni*].
Tugarinov (1929). *Ann. Mus. Zool. Acad. Sci. USSR* **29**: 9 [*Luscinia svecica kobdensis*], 11 [*Luscinia svecica przevalskii*].
Tweeddale (1878). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 20**: 535 [*Ixos everetti*].
Tweeddale (1878). *Proc. Zool. Soc. London* **1877**: 617 [*Pycnonotus plumosus cinereifrons*], 618 [*Ixos palawanensis*], 761 [*Chloropsis flavipennis*].
Tweeddale (1879). *Proc. Zool. Soc. London* **1878**: 947 [*Coracina mindanensis*].
Tye (1991). *Malimbus* **13(2)**: 75 [*Erythropygia leucosticta colstoni*].
Unitt, Messer & Thery (1996). *Proc. San Diego Soc. Nat. Hist.* **31**: 16-17 [*Cistothorus palustris clarkae*].
Valenciennes (1826). *Dict. Sci. Nat.* **40**: 226 [*Nicator chloris*].
Van Tyne (1925). *Occas. Pap. Boston Soc. Nat. Hist.* **5**: 149 [*Phainopepla nitens lepida*].
Verreaux, J. (1870). *Nouv. Arch. Mus. Hist. Nat.* **6**: 34 [*Turdus rubrocanus gouldi*].
Verreaux, J. & Des Murs (1860). *Rev. et Mag. Zool.* **12**: 395 [*Coracina analis*], 431 [*Lalage leucopyga montrosieri*].
Verreaux, J. & Verreaux, E. (1851). *Rev. et Mag. Zool.* **3**: 306 [*Ixonotus, Ixonotus guttatus*], 307 [*Saxicola torquatus salax*].
Verreaux, J. & Verreaux, E. (1855). *J. Orn.* **3**: 105 [*Calyptocichla serina, Baeopogon indicator*].
Verrill (1901). *Osprey* **5**: 84 [*Sialia sialis bermudensis*].
Vieillot (1808). *Ois. Am. Sept.* **1**: 88 [*Bombycilla, Bombycilla cedrorum*]; **2**: 1 [*Margarops fuscatus*], 15 [*Mimus gilvus*].
Vieillot (1809). *Ois. Am. Sept.* **2**: 52 [*Troglodytes, Troglodytes aedon*].
Vieillot (1816). *Analyse*: 37 [*Coracina*], 39, 69 [*Campephaga*], 42 [*Dulus*], 43 [*Prunella, Oenanthe*], 44 [*Aegithina*], 45 [*Thryothorus*].

Vieillot (1817). *Nouv. Dict. Hist. Nat. (Nouv. éd.)* **10**: 49 [*Campephaga flava*]; **11**: 177 [*Erythropygia coryphaeus*], 191 [*Erythropygia leucophrys*], 267 [*Tarsiger indicus*].
Vieillot (1818). *Nouv. Dict. Hist. Nat. (Nouv. éd.)* **20**: 226 [*Turdus rufiventris*], 227 [*Turdus albicollis*], 232 [*Margarops fuscatus densirostris*], 238 [*Turdus leucomelas*], 253 [*Pycnonotus nigricans*], 254 [*Cossypha albicapillum*], 255 [*Ramphocinclus brachyurus*], 258 [*Pycnonotus aurigaster*], 260 [*Monticola explorator*], 266 [*Andropadus importunus*], 269 [*Enicurus leschenaulti*], 270 [*Lalage sueurii*], 275 [*Mimus triurus*], 276 [*Zoothera peronii*], 277 [*Turdus flavipes*], 281 [*Monticola rupestris*]; **21**: 421 [*Saxicola gutturalis*], 428 [*Saxicola caprata pyrrhonotus*], 431 [*Myrmecocichla nigra, Phoenicurus ochruros rufiventris*], 434 [*Oenanthe monticola*], 468 [*Pogonocichla stellata*], 486 [*Pericrocotus roseus*]; **30**: 291 [*Copsychus malabaricus tricolor*].
Vieillot (1819). *Nouv. Dict. Hist. Nat. (Nouv. éd.)* **34**: 55 [*Thryothorus rutilus*], 56 [*Thryothorus longirostris*], 59 [*Cistothorus platensis polyglottus*], 514 [*Troglodytes troglodytes hiemalis*].
Vieillot (1822). *Tabl. Encyc. Méth. Orn.* **2**: 646 [*Turdus plumbeus ardosiaceus*].
Vigors (1825). *Zool. J.* **2**: 396 [*Cossypha*].
Vigors (1830). In: Anon. (1830). *Lady Sophia Raffles, Mem. Life and Public Services Sir T. S. Raffles*: 674 [*Chloropsis sonnerati zosterops*].
Vigors (1831). *Proc. Zool. Soc. London* **1831**: 9 [*Enicurus maculatus*], 35 [*Myophonus horsfieldii, Chaimarrornis leucocephalus, Phoenicurus caeruleocephala, Rhyacornis fuliginosa*], 43 [*Hypsipetes, Hypsipetes leucocephalus psaroides, Pericrocotus brevirostris*], 92 [*Zoothera guttata*], 97 [*Irena cyanogastra*].
Vigors (1832). *Proc. Zool. Soc. London* **1831**: 171 [*Myophonus caeruleus temminckii*], 172 [*Zoothera, Zoothera monticola, Monticola cinclorhynchus, Phoenicurus frontalis*], 174 [*Enicurus scouleri*].
Vigors (1839). *Zool. Beechey's Voy. Pacific & Behring's Strait*: 17 [*Mimus polyglottos leucopterus*], 18 [*Thryomanes bewickii spilurus*].
Vigors & Horsfield (1827). *Trans. Linn. Soc. London* **15**: 215 [*Lalage leucomela*].
Vincent (1933). *Bull. Brit. Orn. Club* **53**: 138 [*Pseudalethe choloensis namuli*].
Vorderman (1893). *Natuurk. Tijdschr. Nederl.-Indië* **42**: 197 [*Copsychus malabaricus nigricauda*].
Wagler (1827). *Systema Avium*: 306 [*Copsychus*].
Wagler (1831). *Isis von Oken* **24**: 528 [*Toxostoma*].
Wahlberg (1855). *Öfversigt K. Vetenskaps-Akad. Förhandlingar, Stockholm* **12**: 213 [*Cercomela schlegelii, Cercomela tractrac albicans*].
Walden (1870). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 5**: 417 [*Irena puella turcosa*].
Walden (1871). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 7**: 241 [*Chloropsis cochinchinensis chlorocephala*].
Walden (1872). *Ann. and Mag. Nat. Hist.* **Ser. 4, no. 9**: 400 [*Thapsinillas longirostris aurea*].
Walden (1872). *Trans. Zool. Soc. London* **8**: 69 [*Lalage leucopygialis*].
Walden (1874). *Ann. and Mag. Nat. Hist.* **14**: 156 [*Zoothera citrina andamanensis*].
Wallace (1863). *Proc. Zool. Soc. London* **1862**: 339 [*Thapsinillas longirostris*]; **1863**: 28 [*Thapsinillas affinis mysticalis*].
Wallace (1864). *Proc. Zool. Soc. London* **1863**: 492 [*Pericrocotus flammeus exul*].
Waterhouse (1838). In: Alexander, *Exped. Int. Africa* **2**: 263 [*Monticola brevipes*].
Watson (1961). *Postilla* **52**: 9 [*Prunella modularis euxina*].
Wells, Dickinson & Dekker (2003). *Zool. Verhand. Rijksmuseum Nat. Hist. Leiden* **344**: 32 [*Chloropsis cochinchinensis auropectus*].
Wetmore (1925). *Ibis*: 845 [*Lalage maculosa woodi*].
Wetmore (1927). *Proc. Biol. Soc. Washington* **40**: 55 [*Turdus swalesi*].
Wetmore (1946). *Smiths. Misc. Coll.* **106**: 9 [*Thryothorus leucotis collinus*], 10 [*Turdus leucomelas cautor*].
Wetmore (1955). *Noved. Colomb.* **2**: 46 [*Catharus fuscater opertaneus*].
Wetmore (1957). *Smiths. Misc. Coll.* **134**: 76 [*Troglodytes musculus carychrous*].
Wetmore (1958). *Proc. Biol. Soc. Washington* **71**: 2-3 [*Troglodytes musculus effutitus*].
Wetmore (1959). *Smiths. Misc. Coll.* **139**: 14 [*Thryothorus nigricapillus odicus*].
Wettstein (1916). *Anz. K. Akad. Wiss. Wien, Math.-Naturw. Kl.* **53**: 135 [*Thamnolaea cinnamomeiventris kordofanensis*].
Whistler (1931). *Bull. Brit. Orn. Club* **52**: 40 [*Pycnonotus jocosus abuensis*].
Whistler (1939). *Bull. Brit. Orn. Club* **59**: 102 [*Hemipus picatus leggei*].
Whistler (1940). *Bull. Brit. Orn. Club* **60**: 90 [*Saxicola caprata nilgiriensis*].
Whistler (1941). *Ibis*: 319 [*Copsychus malabaricus leggei*].
Whistler & Kinnear (1932). *J. Bombay Nat. Hist. Soc.* **35**: 752 [*Chloropsis aurifrons insularis*], 754 [*Pycnonotus cafer saturatus, Hypsipetes ganeesa humii*], 759 [*Pycnonotus luteolus insulae*]; **36**: 73 [*Saxicoloides fulicatus intermedius*].
Whistler & Kinnear (1933). *J. Bombay Nat. Hist. Soc.* **36**: 340 [*Pericrocotus flammeus semiruber*].
Whitehead (1907). *Bull. Brit. Orn. Club* **21**: 19 [*Troglodytes troglodytes magrathi*].
Wied (1821). *Reise Bras.* **2**: 148 [*Campylorhynchus turdinus*].
Wilkes (1817). *Encycl. Londinensis* **16**: 86 [*Cercomela familiaris*], 88 [*Myrmecocichla formicivora*], 89 [*Cercomela tractrac*].
Williamson (1951). *Ibis*: 599 [*Troglodytes troglodytes fridariensis*].
Wilson, A. (1810). *Amer. Orn.* **2**: 58 [*Cistothorus palustris*].
Wilson, S.B. (1891). *Ann. and Mag. Nat. Hist.* **Ser. 6, no. 7**: 460 [*Myadestes lanaiensis*].
Witherby (1906). *Bull. Brit. Orn. Club* **16**: 71 [*Cinclus cinclus persicus*].
Wood, C.T. (1837). *Analyst* **5**: 206 [*Dumetella*].
Xántus de Vesey (1860). *Proc. Acad. Nat. Sci. Philadelphia* **11**: 298 [*Campylorhynchus brunneicapillus affinis, Toxostoma cinereum*].
Zarudny (1897). *Zapiski Imp. Akad. Nauk, St. Pétersbourg* **3**(Suppl.): 186 [*Luscinia svecica pallidigularis*].
Zarudny & Loudon (1904). *Orn. Jahrb.*: 225 [*Luscinia svecica magna*].
Zarudny & Loudon (1905). *Orn. Monatsber.* **13**: 107 [*Troglodytes troglodytes hyrcanus, Troglodytes troglodytes subpallidus*].
Zarudny & Loudon (1908). *Orn. Monatsber.* **16**: 29 [*Troglodytes troglodytes zagrossiensis*].
Zimmer, J.T. (1932). *Amer. Mus. Novit.* **573**: 3 [*Cyphorhinus phaeocephalus infuscatus*].
Zimmer, J.T. (1944). *Auk* **61**: 404 [*Catharus aurantiirostris inornatus*], 406 [*Catharus aurantiirostris insignis*].
Zimmer, J.T. & Phelps, Sr (1944). *Amer. Mus. Novit.* **1270**: 13 [*Henicorhina leucophrys tamae*].
Zimmer, J.T. & Phelps, Sr (1945). *Amer. Mus. Novit.* **1274**: 6 [*Troglodytes rufulus fulvigularis*].
Zimmer, J.T. & Phelps, Sr (1946). *Amer. Mus. Novit.* **1312**: 18 [*Microcerculus ustulatus lunatipectus, Microcerculus ustulatus obscurus*], 19 [*Cyphorhinus arada urbanoi, Cyphorhinus arada faroensis*].
Zimmer, J.T. & Phelps, Sr (1947). *Amer. Mus. Novit.* **1338**: 6 [*Thryothorus coraya obscurus*].
Zimmer, J.T. & Phelps, Sr (1955). *Amer. Mus. Novit.* **1709**: 4 [*Turdus fumigatus orinocensis*].

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